
Public Hearing

of

ASSEMBLY SCIENCE INNOVATION AND TECHNOLOGY COMMITTEE

"The Committee will hear testimony from invited guests on the topic of innovation and start-up ecosystems in New Jersey"

LOCATION: New Jersey Bioscience Center
North Brunswick Township, New Jersey

DATE: November 30, 2022
1:00 p.m.

MEMBERS OF COMMITTEE PRESENT:

Assemblyman P. Christopher Tully, Chair
Assemblyman James J. Kennedy
Assemblywoman Carol A. Murphy
Assemblywoman Lisa Swain
Assemblyman Christian E. Barranco
Assemblywoman DeAnne C. DeFuccio
Assemblyman Christopher P. DePhillips



ALSO PRESENT:

Mikaela Chianese
Suzanne Miller
*Office of Legislative Services
Committee Aides*

Jack Barnes
Allison Meyers
*Assembly Majority
Committee Aides*

Reina Smrdelj
*Assembly Republican
Committee Aide*

***Hearing Recorded and Transcribed by
The Office of Legislative Services, Public Information Office,
Hearing Unit, State House Annex, PO 068, Trenton, New Jersey***

P. Christopher Tully
Chair

Linda S. Carter
Vice Chair

William F. Moen
Ellen J. Park
Christian E. Barranco
DeAnne C. DeFuccio
Christopher P. DePhillips



Mikaela Chianese
Suzanne Miller
Office of Legislative Services
Committee Aides
609-847-3840
Fax 609-292-0561

NEW JERSEY STATE LEGISLATURE

**ASSEMBLY SCIENCE, INNOVATION AND
TECHNOLOGY COMMITTEE**

STATE HOUSE ANNEX • P.O. BOX 068 • TRENTON, NJ 08625-0068
www.njleg.state.nj.us

PUBLIC HEARING NOTICE

The Assembly Science, Innovation, and Technology Committee will hold a public hearing on Wednesday, November 30, 2022 at 1:00 PM at the New Jersey Bioscience Center, 675 US-1, Building 1, 1st Floor, Room B102 R&D, North Brunswick Township, New Jersey.

The public may address comments and questions to Mikaela Chianese, Suzanne Miller, Committee Aides, or make bill status and scheduling inquiries to Kimberly Johnson, Secretary, at (609)847-3840, fax (609)292-0561, or e-mail: OLSAideAST@njleg.org. Written and electronic comments, questions and testimony submitted to the committee by the public, as well as recordings and transcripts, if any, of oral testimony, are government records and will be available to the public upon request.

The committee will hear testimony from invited guests on the topic of innovation and start up ecosystems in New Jersey.

Those individuals presenting written testimony are asked to provide 25 copies to the committee aide at the meeting.

Issued 11/18/22

For reasonable accommodation of a disability call the telephone number or fax number above, or for persons with hearing loss dial 711 for NJ Relay. The provision of assistive listening devices requires 24 hours' notice. CART or sign language interpretation requires 5 days' notice.

For changes in schedule due to snow or other emergencies, see website <http://www.njleg.state.nj.us> or call 800-792-8630 (toll-free in NJ) or 609-847-3905.

TABLE OF CONTENTS

	<u>Page</u>
Kathleen Coviello Chief Transformation Officer New Jersey Economic Development Authority (NJEDA)	3
Judith Sheft Executive Director New Jersey Commission on Science, Innovation and Technology New Jersey Economic Development Authority	9
John W. Kennedy, Ph.D. Chief Executive Officer New Jersey Manufacturing Extension Program (NJMEP)	22
Constantina Meis Community Relations Manager New Jersey Manufacturing Extension Program	26
Angela Garretson, Ph.D. Chief External Affairs Officer New Jersey Institute of Technology (NJIT), and County Commissioner Union County	29
Michael Egenton Executive Vice President of Government Relations New Jersey Chamber of Commerce	33
Aaron Price President and Chief Executive Officer TechUnited:NJ, and Board Member New Jersey Chamber of Commerce	34
Kim Case, Esq. Executive Director Research and Development Council of New Jersey, and President CN Communications	48

TABLE OF CONTENTS (continued)

Haskell Berman Co-Founder Innovation New Jersey, and Senior Vice President State Affairs HealthCare Institute of New Jersey (HINJ)	52
Kyle Sullender Director Economic Policy Research New Jersey Business and Industry Association (NJBIA)	57
Barbara DeMarco Vice President Porzio Governmental Affairs	64
Thomas MacLellan Director of Government Affairs Palo Alto Networks	64
Christine Arnold-Schroeder Vice President External Affairs Liberty Science Center	74
Ian McLaughlin, Ph.D. Vice President Government Affairs BioNJ	79
Fred M. Brody Owner Brody Business Development	82
Joseph Montemarano Retired Director Innovation and External Alliances at Princeton Institute for the Science and Technology of Materials (PRISM) Princeton University	85
David Rousseau Vice President	

Association of Independent Colleges and Universities of New Jersey	87
TABLE OF CONTENTS (continued)	

Michael E. Zwick, Ph.D. Senior Vice President for Research Rutgers University	88
---	----

Anthony Lowman Provost and Senior Vice President for Academic Affairs Rowan University	98
---	----

Luis De Abreu STEM Program Director Bergen Community College	103
--	-----

Maria Rodriguez-Gregg Director of Government Relations and Community Affairs Montclair State University	107
---	-----

Lora Billings, Ph.D. Dean College of Science and Mathematics Montclair State University	108
--	-----

Valeria Aloe Co-Director Feliciano Center for Entrepreneurship and Innovation Montclair State University	110
---	-----

Elizabeth Rich Co-Director Feliciano Center for Entrepreneurship and Innovation Montclair State University	111
---	-----

APPENDIX:

Testimony submitted by Tim Sullivan, and Kathleen Coviello	1x
---	----

Testimony submitted by Judith Sheft	4x
---	----

TABLE OF CONTENTS (continued)
APPENDIX (continued)

Testimony submitted by Angela R. Garretson, Ph.D.	7x
Testimony submitted by Aaron Price	10x
Testimony submitted by Kim Case, Esq.	13x
Testimony submitted by Kyle Sullender	15x
Testimony submitted by Thomas MacLellan	18x
Testimony submitted by Christine Arnold-Schroeder	23x
Testimony submitted by Debbie Hart and Ian McLaughlin, Ph.D.	29x
Testimony submitted by Fred M. Brody	31x
Additional Materials submitted by David Rousseau	33x
Testimony submitted by Michael E. Zwick, Ph.D.	127x

TABLE OF CONTENTS (continued)
APPENDIX (continued)

Testimony and
Additional Materials
submitted by
Anthony Lowman, Ph.D. 134x

Testimony
submitted by
Maria Rodriguez-Gregg,
Lora Billings, Ph.D.,
Valeria Aloe, and
Elizabeth Rich 172x

Testimony
submitted by
Margaret Durkin
Executive Director, Pennsylvania and the Mid-Atlantic
TechNet 175x

Building Bridges II: Breaking Down Barriers
Perspectives from Academia and Industry on Building
A New Jersey Innovation Ecosystem
submitted by
NJPRO and
InnovationNJ 179x

Testimony
submitted by
InnovationNJ 202x

mej: 1-115

ASSEMBLYMAN P. CHRISTOPHER TULLY (Chair): Good afternoon.

Thank you so much everybody for joining us here today at the Assembly Science, Innovation, and Technology hearing.

We have a lot of testimony here, so we'll get started with the Pledge of Allegiance. We did not have a flag in the room. It's small in stature, but mighty with American spirit. (laughter)

So, please, join us in saluting our flag.

(Pledge of Allegiance recited)

OK. Suzanne, please call the roll.

MS. MILLER: Assemblyman Barranco.

ASSEMBLYMAN BARRANCO: Here.

MS. MILLER: Assemblywoman DeFuccio.

ASSEMBLYWOMAN DeFUCCIO: Here.

MS. MILLER: Assemblyman DePhillips. (no response)

Assemblywoman Swain.

ASSEMBLYWOMAN SWAIN: Here.

MS. MILLER: Assemblywoman Murphy.

ASSEMBLYWOMAN MURPHY: Here.

MS. MILLER: Assemblyman Kennedy.

ASSEMBLYMAN KENNEDY: Here.

MS. MILLER: Chairman Tully.

ASSEMBLYMAN TULLY: Here.

Good afternoon. I am excited to kick off today's Assembly Science, Innovation, and Technology hearing at the New Jersey Bioscience Center.

Our Committee spent the morning touring this incredible space here at the New Jersey Bioscience Center, seeing firsthand the incubator and step-out labs that have helped rapidly growing companies get off the ground. I know that I speak for myself and the entire Committee when I say that the Bioscience Center is propelling New Jersey forward, and that the work being done here is nothing short of inspiring.

Since I began my term as the Chair of this Committee, I have spent many hours on what I called a listening tour. Across the state, with many players, influencing our start-up community. We know that New Jersey has a lot of excellent selling points: A highly educated workforce; widely accessible broadband and fiber optic services; proximity to business hubs in New York City, Boston, and Washington, D.C.; State resources and guidance provided by entities like the New Jersey EDA and the Commission on Science, Innovation, and Technology; and incredible communities to live in while we build and foster our business community.

But, we know that New Jersey has unmet potential in the start-up and entrepreneurial space, which is what today is all about. Our Committee wants to know, how can we live up to that potential? How do we get the best minds in the country to come here and stay here in New Jersey? To develop lifesaving medical technology; to prepare 21st-century technology with tried-and-true best practices; to invent something we've never seen before; and to reimagine the way that we do business?

Here today are representatives from industries, associations, higher education, government agencies, startups, and businesses to share their experience in the start-up space, and help us meet -- and exceed -- the state's potential for growth.

I look forward to hearing from each and every one of you today. I ask that you keep your testimony to about five minutes, to allow us to hear from everyone. This is a good problem to have; we have a tremendous outpouring here. Usually, when you send out invites, you know, you don't get as vigorous a response, but clearly this is an issue that matters to many of you. It matters to us and our Committee; and it's important for the State of New Jersey.

So, I really just wanted to take this moment to thank everyone for taking time out of their busy schedules and their days. We will try to be cognizant of everybody's time, and we just ask again, try to keep your testimony to five minutes. I want to allow our Committee members here to ask questions, so we can have a full conversation. And, what we're really hoping to get out of this are ideas, suggestions, and ways to work with you from our perch here in the Committee to come up with ideas and bills and legislation that really helps foster the innovation and start-up community here in the state.

And, with that, I thank you all, and let's kick off with Kathleen Coviello, New Jersey EDA's Chief Economic Transformation Officer. And, I think we're also going to ask if there's room to have Judith Sheft, the Executive Director of New Jersey's Commission of Science, Innovation, and Technology begin this hearing.

So, Kathleen and Judith, thank you so much for being here, and let's get started.

KATHLEEN COVIELLO: Great, thank you.

I am testifying to you all this morning on behalf of New Jersey EDA's CEO, Tim Sullivan; he sends his regards.

Chairman Tully and members of the Assembly Science, Innovation, and Technology Committee, it is an honor to provide testimony today that discusses New Jersey's ever-growing innovation economy.

Under Governor Murphy's leadership, New Jersey is poised to recapture our historic legacy of leadership in innovation and entrepreneurship, while simultaneously cultivating the most diverse and inclusive innovation economy in America.

I would like to thank the Committee for letting us hold today's hearing at the New Jersey Bioscience Center, our 50-acre research park located in the heart of the state's research corridor. As you saw -- many of you this morning -- it offers a multitude of lab and office space, and options for companies, as well as a supporting environment to help nurture our state's entrepreneurs in the life science sector.

Today, the center is home to 20 companies in the incubator, and eight in our step-out labs. The EDA has invested over \$70 million in this facility and continues to make investments in it as we continue to see opportunities to support an ever-growing life science sector in the State of New Jersey.

New Jersey is more than just a hub for innovation, it's a first mover, creating ground-breaking programs that invest in entrepreneurs and companies looking to start, scale, and, of course, stay in the State of New Jersey. These investments are contributing to our unprecedented economic momentum. In 2021, New Jersey moved back into the top 10 states for venture capital -- a key indicator for success for the innovation economy. We had fallen down to 16th in the country -- certainly not a ranking that we were proud of.

We were also recently noted by Looka as one of the top three states in the nation to start a business. Additionally, business formation in New Jersey continues to grow, with the state experiencing close to 16% increase in business filings. That's when looking at October 2020 to October 2022.

In addition to these data points, New Jersey's momentum in innovation is evident in several major recent announcements. New Jersey, you may have read, recently competed against six other states to be the home of HAX's global headquarters, for its partner accelerate program for pre-seed and hard tech companies. HAX, backed by SOSV Ventures, is focused on clean tech, decarbonization, hardware accelerator. SOSV Ventures was ranked as one of the most active early-stage investors in the country. So, bringing them here to New Jersey was certainly a feather in our cap. The initiative was funded by Governor Murphy's strategic innovation center program, and is expected to create 2,500 jobs in and around Newark in the coming years.

New Jersey's success in securing leading innovation companies, like HAX, serves as a testament to our state's competitive advantage over leading locations like Silicon Valley for startups, due to our unparalleled location, talent, diversity, education system, and innovation system. And, these are facts that held true when we talked to the leaders at HAX. HAX is going to create 2,500 jobs and create 100 new startups. Some of those startups have already started moving into their facility in Newark, and come from the likes of Seattle and California. We've heard from these entrepreneurs firsthand that they're setting up residency here and are thrilled of all the talent resources that they are finding in New Jersey's universities.

The Innovation Hub in New Brunswick -- also a big initiative, with more than 1.1 million square feet of research space. This will serve as a center of life science innovation and medical education. It will be a state-of-the-art facility, including medical students, collaborative space for researchers. It will include private universities like Princeton, and entities like Hackensack Meridian Health and Robert Wood Johnson. It will be the first of its kind in the country that you can go from ideation at a university to bedside with Rutgers Medical School there.

You've also heard that we've brought Pfizer's corporate headquarters here, with 3,000 new jobs. The New Jersey Wind Port, the first purpose-built offshore wind facility in the U.S., will bring over 1,500 ongoing jobs to New Jersey.

This year, the EDA opened up the New Jersey Innovation Evergreen Fund; again, a first-of-its-kind in the country to bring together venture capitalists; our best-in-class corporate citizens; and entrepreneurs looking to raise capital. It's a full-loop structure that will bring together those parties on a regular basis.

We've had our first tax credit auction this fall; we've opened up with a \$30 million beta program and had to increase it to \$50 million because of the strong demand. We expect to go to the EDA's board in December to approve the awards under that tax credit auction.

The EDA's most progressive and potent suite of innovation tools in the nation, including significant enhancements to long-standing programs undertaken in the last several years, is what's allowing these companies to grow in the state. These programs are focused on strategic investments, access to capital, and growing our state's talent ecosystem.

I know I'm running close on time here, so I'll--

ASSEMBLYMAN TULLY: That's all right; please, keep going.

MS. COVIELLO: I'll run through some of these for you all.

Seventy million dollars in the recent State budget for strategic innovation centers is going to create more place-based economic development -- similar to what we recently deployed with the HAX investment. This is a public-private partnership where the EDA plays as a strategic investor. We anticipate announcing more of these strategic innovation centers that will cluster innovation, entrepreneurs, universities, all in one place with a targeted industry focus.

NJ Ignite -- several of the members heard this morning about that program -- that facilitates access to places like this Bioscience Center and incubators. It provides grants for young companies to come out of their houses and out of their garages and be part of a supportive community. This center, of course, a 50-acre research park, is part of our real estate investment support. And, as I've said already, the Innovation Hub in New Brunswick.

Relative to access to capital for entrepreneurs, as recently approved in the State budget, there's \$10 million for a Black and Latino seed fund to allow underserved communities to access capital that they may have not been able to secure in the past.

NJ Accelerate, which was recently launched at the EDA, again, takes that theme of supporting entrepreneurs and encourages them to participate in best-in-class accelerator programs. When we partner with these accelerators, we have a resource to send New Jersey entrepreneurs to. And, then, we provide matching funds once they've graduated from these accelerators. The best form of flattery here is that New York recently

announced a program that looks just like our NJ Accelerate program here in New Jersey.

The New Jersey Angel Investor Tax Credit program encourages private investors to invest in New Jersey companies and bring their resources, their know-how, to these companies. They receive a 20-25% tax credit for investing in our New Jersey businesses -- a great way to capitalize on the mindshare in New Jersey; keep our highly educated, highly trained, and high-net-worth individuals active in our innovation community. To date, we've approved over \$800 million in tax credits and supported 120 technology businesses under that program.

And, of course, one of our long-standing programs in the state to help access capital is our Technology Business Tax Certificate Transfer Program, which we affectionately call the NOL program, which allows many companies that thought they had no assets to sell an untapped asset in their losses. The average award for these companies was over \$3 million per company this year, and much to the happiness of many of our entrepreneurs, they don't have to give up any equity. So, it's a win-win for all of those who are involved, and we have companies coming back year after year to participate in that program.

And, the third pillar that I'll mention that we're focused on is investment in talent in the innovation ecosystem. You may recall recently the State budget included \$10 million for an innovation fellows program -- first of its kind for New Jersey -- to support wannabe entrepreneurs. The Authorities Board recently approved that program, and it will launch in early 2023. Participants can get up to \$400,000 to substitute income and allow them to start a business here in New Jersey. There's bonuses in that program

for diverse entrepreneurs, graduates of our research universities, and higher education institutes as well.

And, then, I will finally mention Golden Seeds. It's an initiative focused on investing in women-led businesses. It's a national network for Angel investors, again, following that pattern of working with the talent that we have in New Jersey; accessing their brain know-how; and putting their dollars to work. We've raised over \$4.5 million for companies in New Jersey from this private Angel networking group. The New Jersey chapter started right as COVID launched, and we actually were very successful in securing 34 chapter members in a very, very short tenure, and we've hosted over 100 female-led businesses at our monthly office hours.

In summary, from Thomas Edison's creation of the lightbulb to Alice Parker's invention of home heating, New Jersey has a long history of investing in entrepreneurs that change our world, all for the better. As we continue our state's impressive legacy of leadership, I stand committed to working with all of you in growing these companies in the future in the State of New Jersey.

Thank you for your time.

ASSEMBLYMAN TULLY: Thank you, Kathleen, I appreciate it.

We'll open up to Judith, and then we'll just open up to questions from the Committee.

So, Judith.

JUDITH SHEFT: Sure; thank you.

Chairman Tully, Committee members, thank you for the opportunity to provide input on early-stage R and D and entrepreneurship in New Jersey.

I am Judith Sheft, Executive Director of the New Jersey Commission on Science, Innovation, and Technology -- affectionately known as CSIT. CSIT is responsible for strengthening the innovation economy within the state; encouraging collaboration and connectivity between industry and academia; and the translation of innovations into successful, high-growth businesses. CSIT has a focus on very early-stage innovation-based entrepreneurs in sectors including life sciences; clean energy and wind; advanced manufacturing; technology encompassing areas such as digital communication; and information technology. Our programs are designed to amplify and accelerate positive commercialization outfits. CSIT creates linkages to enable entrepreneurs to successfully access critical Federal resources, such as the SBIR/STTR funding, and provides connections and capabilities to New Jersey academic and nonprofit institutions. Diversity, equity, and inclusion is a key foundation as we strive to ensure that New Jersey's innovation economy is the most diverse in the nation, increasing participation by women, underrepresented minorities, veterans, LGBTQ+ innovators.

When CSIT was re-established in 2018, NJEDA helped to incubate the commission. The relationship has been instrumental in enabling CSIT to launch its initiatives efficiently and effectively. CSIT programs complement NJ EDA programs, and many CSIT awardees have received NJ EDA support as well. While entrepreneurs are always looking to raise needed capital from dilutive and non-dilutive sources, experience indicates that they

require additional support to be successful. CSIT programs address these multiple needs with connections to resources and partners, training, and financial grant support.

To assist with connections, the Research with New Jersey platform provides information on five partner institutions: Montclair, NJIT, Princeton, Rowan, and Rutgers, with plans to extend to additional New Jersey institutions. Currently, Research with New Jersey contains information on close to 4,500 researcher profiles; 268,000 research outputs; and 158 research facilities. CSIT collaborates with the New Jersey small business development centers on coaching and training for New Jersey entrepreneurs looking to obtain Federal SBIR/STTR grants. New Jersey lags its neighboring states in obtaining SBIR/STTR funding. The New Jersey Small Business Development Center was recently awarded a fast grant from the Federal Small Business Administration to provide technical support.

Last week, an initial SBDC CSIT webinar was held with close to 200 attendees, and this afternoon, CSIT, SBDC, Bio New Jersey, and the National Institutes of Health are holding a webinar on translational research and SBIR. CSIT has built a suite of funding programs for early-stage entrepreneurs. To date, we supported 160 companies with over \$7 million in funding. Our seed grant and SBIR/STTR financial-support programs are competitive, and applications with the highest scores are awarded. The R and D voucher programs are awarded on a rolling basis. Our programs include SBIR/STTR direct funding programs for companies that have received Federal funding. We recently completed the fourth round of applications, and those applications are in the process of being scored.

The SBIR/STTR program provides \$25,000 of funding to companies that had a Phase 1 award in the last two years, and \$50,000 of bridge funding for companies that have completed Phase 1 are waiting to hear about their Phase 2 awards. The Federal Phase 1 program is typically a nine- to 12-month program providing up to \$250,000 to a company, and in Phase 2, companies can have a program lasting up to one to three years. Eleven Federal agencies participate in this program, and, overall, at the Federal level, it's a \$3.5 billion program. In the first three rounds of funding, we've provided \$1.9 million of support to 66 New Jersey companies. Twenty-six other states have similar support programs.

We have a similar range of R and DC grant programs covering clean tech, life sciences, drug therapeutics, medical devices, technology, advanced materials, infant health, and food and ag. innovation. Companies are able to receive awards of between \$75,000 and \$250,000 depending on the program topic areas. Our state grant programs have been over-subscribed by two to three times, indicating a real pent-up demand for early-stage funding to enable entrepreneurs to demonstrate capabilities that will allow them to be successful in obtaining follow-on funding.

Our clean tech and catalyst R and D voucher programs facilitate usage of core facilities at New Jersey universities, Federal labs, and nonprofit research institutions. These facilities are too expensive for an entrepreneur to afford, and the R and D voucher grants are awarded on a rolling basis, and CSIT meets bi-weekly with core lab representatives to link applicants to appropriate facilities. The program has been extremely successful, enabling applicants to get the needed data to apply for Federal grants, and potentially enter into broader collaborations with their academic institutions.

To date, on the clean tech voucher program, we've provided 10 awards with eight more in the pipeline. Companies have utilized facilities at Montclair, NJIT, Princeton, and Rutgers. On the Catalyst Program, 25 applications have been received -- seven in the pipeline -- and awardees have utilized facilities at Kean University, NJIT, Princeton, and Rutgers. Our programs have achieved a very positive economic output for the economy. An initial economic assessment of the first two cohorts of 28 companies that received SBIR support from the Commission was conducted by NJIT. Forty-three percent of those companies added new employees, for a total of 38 new employees, 29 full-time, four part-time, and five interns. Fifty percent of the companies received new patents; 25% of the companies expanded office and lab space. And, this was during COVID.

In addition, in total, the companies obtained an additional \$12.2 million of investment in follow-on funding -- over 14 times the CSIT direct financial assistance. The new investments were in the forms of grants, loans, and private-company investments. The majority of the companies that CSIT supports have five or fewer employees. Applicants have been located throughout the state, and we leverage connections with the African American Chamber, Statewide Hispanic Chamber, Veterans Chamber, Bio New Jersey, Tech United, and other organizations to increase the diversity of our talent pool. More work needs to be done to increase intentional outreach to this population, including working with university tech transfer offices, local chambers, along with social media posting to relevant networking groups to raise awareness of CSIT opportunities.

Since its re-establishment, CSIT has been a source of support and connection for New Jersey's R and D intensive companies. Programs

have been modified based on insights learned from the early pilots. Additionally, the significant R and D opportunities at the Federal level, such as the CHIPS Act and Infrastructure Act, CSIT has stepped up to help catalyze, coordinated New Jersey responses to obtain large Federal funding opportunities involving multiple academic and industrial partners.

I appreciate the opportunity to provide insight to the Committee.

ASSEMBLYMAN TULLY: Wonderful.

Judith, Kathleen, thank you so much for being here today and all that you do on behalf of the State of New Jersey, startups, and businesses here in the state.

I just want to ask a couple questions from your testimony-- And, thank you for all the time you've spent with me this year, as we've gotten to learn all of the incredible programs you do, and they are; they're incredible programs that do a lot of great for the community and for the state.

And, I feel like too often, New Jersey has a messaging problem. You know, instead of focusing on the positives of why this is a critical state to do business in, with a lot of talent; with incredible communities and schools to raise your families; to raise your children, and to have a family. There's a focus on what *isn't* working.

So, can you tell me, how can we counteract that? How do we get the proper messaging out there, what we can do when a company is looking to grow and to build, and where New Jersey becomes one of the first states that they look at. How do we best promote the innovation economy here?

Easy question, I know.

MS. COVIELLO: So, we've certainly worked closely with our partners at Choose New Jersey on building out criteria that shows -- or, collateral, that shows all the initiatives. But, I think one of the newer initiatives that we've had at the Economic Development Authority is really to break down our outreach by sectors, so that we have folks that are talking to only life science entrepreneurs. And, we're helping to make those connections so that as many of the Assemblymen and women heard this morning, folks that have been successful here can kind of share that story.

So, I think that's one mechanism to continue to build on that. You know, success begets success, and getting that story out firsthand from the voice of the entrepreneurs, I think, is critical. We are working on increasing our social media reach at the EDA for certain, and continue to look for creative ideas around the storytelling. I think a lot of it is storytelling, right, that personal experience that resonates.

And, if you look to the west coast on how that innovation ecosystem became so successful, it's because of the results of an IPO and the next tier of management went out and started another company. And, so, we've got to work hard to make sure that the second tier of management in these companies, and the third tier, know about the resources and it serves as a jumping off point for them.

ASSEMBLYMAN TULLY: I appreciate that, thank you.

MS. SHEFT: I also think that, now that COVID is over, we have the opportunity to attend different events, different meetups, so we have an opportunity to give our story and to also leverage the companies who have received funding, both from CSIT and the EDA to really amplify what we've

done and how the funding that they've received have really helped propel them, helped propel them forward.

MS. COVIELLO: I know we have a number of partners in the room, so I would say leveraging our partners is critical; be it Bio NJ; be in Tech United. And, using their platforms and reach as well into all of their member companies, I think, is critical.

ASSEMBLYMAN TULLY: I appreciate that, and I think you do a wonderful job with the resources that you have.

As I've stated, I think New Jersey has a marketing problem. We are a state that offers a lot to the business community, to the start-up community when it comes to our communities; when it comes to our education; when it comes to our talent pool. And, you know, that's certainly something that I think the Committee wants to be helpful with, and we certainly look for any suggestions that you have to help work on that, which is, I think, obviously, a broader issue that we all want to tackle.

If I could just ask-- So, again, a lot of phenomenal work that you're doing right now. If I could just ask, what are some of the barriers that exist that hinder growth within New Jersey? What are some of the top-line issues that you think the State or our Committee should be tackling?

MS. COVIELLO: So, certainly, hit on the top one, right, with messaging.

There's a consistent theme around capital -- growing businesses is critical to capital, and it's got to be smart capital. Over 60% of the capital that comes into New Jersey businesses comes from out-of-state investors. As I shared earlier with some of you, I think we're starting good groundwork to help change that tide. Certainly, the data is very strong with us coming back

into the top 10 of venture capital raise. The Evergreen Fund, we're very, very hopeful that it makes the investors that we will partner with there look hard at New Jersey.

So, the ability to double down on your investments in New Jersey will be critical, but we don't want investors coming in for a day and leaving. We want them spending more time here. When we build the Hub, one of our goals and plans in that building is to require office hours for our investor partners so that physicality and that connection is so critical.

And, as Judith said, coming out of COVID, we're starting to get people back together again, so I think any opportunity to coalesce folks in a physical place with like-minded interests is going to help rise the tide in the state.

ASSEMBLYMAN TULLY: And, if I could ask you to touch upon-- Because, you know, our Committee had the opportunity to tour the incubator up at Bergen Community College, and it was a phenomenal facility, the work you do.

Can you take us a little bit more about how you're looking to foster the incubators here at the state, and what more do you think can be done?

MS. COVIELLO: Do you want to take that one?

MS. SHEFT: Sure.

So, there's a number of incubators throughout the State of New Jersey, and some of the facilities similar to the Bioscience Center have wet lab facilities. Others are predominantly office space types of arrangements. And, when I worked at NJIT and was involved with their incubator there, one of the reasons we would tell people you want to be located in an incubator as

opposed to operating out of your basement and Starbucks and kitchen table is that it gives you the opportunity to connect with other like-minded entrepreneurs to learn lessons from them what resources they have been able to use.

And, I think the facilities that we have throughout the state, some of which are located very close to academic institutions, also allow companies the opportunity to hire -- on a part-time basis -- talent. You had asked about, what are some of the hinderances? Some of the small companies that we are talking to are always interested in getting talent. They have the right talent, and by being located close to academic institutions, they're able to have students come and work for them and then go back and forth to classes.

Companies are also interested in small space. Some of the companies aren't quite yet to the stage where they can use larger space, so having that right size of office space is critically important for them.

ASSEMBLYMAN TULLY: OK.

MS. COVIELLO: And, just two comments on that relative to incubators.

Through legislative support, the EDA administers the NJ Ignite program, which is a grant program to get folks and entrepreneurs out of their home and into these collaborative workspaces. And, certainly, during COVID these spaces had a very, very difficult time. So, I think there is an opportunity to make sure that we continue to support not just the entrepreneurs in those spaces, but the host sites themselves. The EDA obviously hosts this site, but not every participant in the NJ Ignite program has a State sponsor. So, I think there's an opportunity there.

The other thing I would mention relative to Judith's comment about nurturing and support is part of that Ignite program requires any host sites that partner with the EDA on that program that they provide mentoring and office hours. The Research with New Jersey platform, which the Commission hosts, is certainly another opportunity to extend the resources of the entrepreneurs. They're always cash-strapped, but being able to go into that database and find out what our research universities are focused on that align within their space can naturally extend their talent pool for them.

So, I think continuing to support the Research with New Jersey platform, and certainly supporting the incubators themselves, can be important tools.

ASSEMBLYMAN TULLY: Thank you so much.

I could probably ask questions all day, but I know we're under the gun.

Does the Committee have any questions, or any areas they'd like to focus on?

ASSEMBLYWOMAN MURPHY: Thank you, Mr. Chairman.

It's not so much a question, but I just wanted to reiterate a statement that you said earlier.

I'm from South Jersey. You looked at the map earlier -- nothing in South Jersey. And, I'm very disappointed in that. We have prominent universities: We have Rowan; we have Rutgers-Camden; we have Stockton. We have community colleges that all are concentrating on businesses and entrepreneurship. I have the joint base in Burlington County, that I meet with veterans who are looking to start entrepreneurships.

I would just ask as we move forward -- especially since I sit on the Budget Committee, and I can tell you, I will be looking for this this year in the budget to assure that when -- and, like the Chairman said -- programs are phenomenal. I think you're doing a great job; I think it's grave that the whole state is not being able to have access to these programs. And, I do know for a fact that they're meeting in my chambers down south; that there are a lot of businesses who could utilize and benefit from these programs.

I would ask, I'm going to be working with (indiscernible) in my office and (indiscernible) to bring this down to South Jersey. The entire state needs to benefit, and I would ask that as you start working on your promotion, and coming from a communication background -- I worked for schools for 10 years under the EDA umbrella as well -- promotion, information. People want information, they want access. It *has* to be there for South Jersey.

So, I would ask that you consider that under your (indiscernible).

Thank you; thank you, Mr. Chairman.

MS. COVIELLO: And, if I could just respond.

I wholeheartedly agree. The map you saw this morning was life science, right. So, I think what we've started to do with our sector focus is to realize different parts of the state have different assets.

I'm down in Pittsgrove on Friday to speak about the wind port. So, certainly, the port work that we're doing on offshore wind has benefited the southern part of the state more significantly. EDA has been partnering with Stockton University on esports, and it's amazing to see the data science that's going in around there.

So, what we will look to do is kind of overlay a map, and it's these natural clusters that are happening because of the talent that fall in different geographies in the state. And, I think to your point, Assemblywoman, there's an opportunity then to take those lessons learned, right, and extend the life science sector into the southern part of the state; extend some of the work that we're doing in offshore wind to the northern part of the state, which also has ports.

So, a lot of building still to happen.

ASSEMBLYWOMAN MURPHY: More colleges are producing exceptional students. (indiscernible) College, we have a Senator (indiscernible). Our young kids, especially women, are looking into science, math, robotics, coding -- you name it, they're into it, and we have to give them the resources to continue.

MS. SHEFT: Let me also comment that in our R and D voucher program, Rowan University, Stockton, and the joint base are all part of the facilities that companies are able to access.

But, you're correct, we don't have as many companies from the southern part of the state as we could have participating in those programs.

Thank you.

ASSEMBLYMAN TULLY: Thank you.

Anybody else? (no response)

All right, thank you so much for being here today.

MS. COVIELLO: Our pleasure; thank you.

ASSEMBLYMAN TULLY: Wonderful, thank you.

And, I know you're pressed for time, so we're going to ask -- you have to take a train down to D.C. -- John Kennedy, a fellow Bergenfield High School alumnus, Constantina Meis, and Dr. Angela Garretson with NJIT.

And, of course, Mr. Kennedy with NJMEP.

UNIDENTIFIED SPEAKER: Is that actually a high school, or did you just make that up?

ASSEMBLYMAN TULLY: There is, no, we were like, one grade apart.

UNIDENTIFIED SPEAKER: Go Bears.

ASSEMBLYMAN TULLY: Go Bears.

UNIDENTIFIED SPEAKER: Dodgers; Madison Dodgers.

J O H N W. K E N N E D Y, Ph.D.: Thank you for having us today.

We wanted to-- We appreciate the point to be heard for NJMEP, who works with almost 11,000 manufacturers in the state who hire about 380,000 people. We actually include the pharmaceutical and life sciences sector, which, for some reason, the state always seems to chop out -- but that's manufacturing.

And, the southern eight counties of New Jersey have more manufacturers in them than 20 other states have in total. So, can't forget about South Jersey. I'm still not convinced about Central. (laughter)

UNIDENTIFIED SPEAKER: Don't knock North.

DR. KENNEDY: But, I'm getting old, so I just can't, you know what I mean.

A couple of quick things is, you know, look: A lot of people are going to talk today about a variety of opportunities and so on, and we know we have (indiscernible). Unabashed Jersey boy. I don't know how my

Scottish father and my Polish mother came together in Madison, New Jersey, a zillion years ago; we're still there.

So, we have great schools that are doing some good work, you can ensure. Whether it's Rutgers, Rowan, NJIT, and so on; a lot of them are partners to us. I love the entrepreneurial stuff that we're doing, because that's important. Thirty-odd years ago, I started a three-person engineering company that grew to 102 people by the time I sold it. So, I'm very proud of what we can do in New Jersey and the talent that's here.

But, I want to call attention to some things that you're missing. If you read National Association of Manufacturing, the recent report on R and D and innovation, they talk about 75% of the private R and D and innovation comes from small- and mid-size manufacturers. Point being is that we need the entrepreneurs -- we certainly need our universities -- but we can't ignore all of these companies that are doing phenomenal things.

I would like to call out -- not that she needs anything, but, you know, Kathleen and Judith, the work that the NJEDA has done with the \$35 million that the State-- In my entire life, that's the most that was ever given to manufacturing. So, I'm pretty happy with that. But, they're investing in companies to advance, and they're investing in innovation. And, that's important. We cannot omit these companies because, you know what, a lot of entrepreneurs don't have any money behind them yet. So, a lot of good ideas may not evolve. But, these small companies -- you know, Haskell Berman is here, and he works a lot with the pharmaceuticals, and he knows that that industry has done it phenomenally, working with smaller companies and evolving them into bigger companies. That's some of the things that we need to do.

On the second thing, you talked a little bit about the CHIPS Act. I know it very well, because I actually wrote part of the bill with Senator Menendez. The MEP system is a national system, and has been very involved with this effort. This was actually the American Competes Act, and it was crushed and put into it. But, there's a lot of areas there. You know, we're probably not going to get a CHIPS manufacturer investment from -- well, probably not; I hope I'm wrong, but probably not. But, if you look in there -- and I have some breakdowns, if anybody wants them, please reach out to me -- some of the breakdowns go through the Department of Commerce. Well, why is that important? Well, the Department of Commerce is where NIST -- the National Institute of Standards and Technology, exists, and the MEP system is overseen by NIST. We're not a government agency, but they oversee us. So, there's very important stuff coming through.

So, what is there? There's talk about tripling their investment in MEP, which is great, but that's not the real money. They're talking about Manufacturing USA Institutes. And, I think Rowan would be a perfect place to put it, you know; I'm just saying that. (laughter)

And, I'm from North Jersey, so, you know, that doesn't mean anything.

But, Manufacturing USA Institutes -- there's 15 of them currently, and New Jersey has none. In fact, we were real close the last time, about six, seven years ago, but we lost out to Delaware. I forget who was the Vice President there. Anyway, we lost out to Delaware, so they put a life sciences institute in Delaware. Not the best choice, but, OK. Right now, they're looking at three more institutes. That means \$70 million investment from the Federal Government.

So, right now, the focus is on CHIPS. I'm not sure they will invest in three CHIPS institutes. But, we should be able to get one. Where we really fell -- we did a tremendous job in our application, but where we really fell short was in the ability to get State support for this, because they want State buy-in. So, it's something that we have to keep in mind as these come out. There was just an RFI. RFP will probably be out early next year, so we have to pay attention to it.

The second part of that is that we have to play better together, and I'm serious about that. Everybody-- New Jersey is a home-rule state, so everybody wants to own everything. So, whether it's your university or anything -- we've got to play well together, because things that I've been told by Federal people that make decisions on this is that New Jersey puts in too damn many applications for every grant, so they give us none. Because we're one of the last states, if not *the* last state, in Federal dollars. So, we have to pay attention to it. We've got Rutgers, NJIT, Rowan, etc. -- Stevens, Princeton. Let's take advantage of that, and let's all work together.

And that's significant. They're also doing 20 innovation hubs -- we should have an innovation hub, maybe offshore wind. Maybe Madison, for that one. But, we have Drew University and FDU, so we're good. But-- No Bergenfield. (laughter)

But, the reality is that these are tremendous investments. We should have at least one in this state. Workforce-development monies. Talking about billions of dollars invested. Right now, there's no money for CHIPS, because there's no budget for next year. Federally, we're still living on a continuing resolution.

But, I will say that the New Jersey delegation has supported all of this effort 100% the last six years; 100%. We're the only state in the nation that they have supported all of these bills. And, if they do invest in this stuff, we need to be ready and in line. And, again, we don't play well together. We have a great state, I love being here, but it's amazing how many times we fight each other instead of fighting towards the end game. When they're talking about billions, there's enough to go around. So, these are things.

There's also a lot of investment in workforce development coming out of the CHIPS Act; we should be there. I know it's already red-lit on me, so I'm sorry about that--

ASSEMBLYMAN TULLY: No, please keep going if you need; absolutely.

DR. KENNEDY: My younger brother, James, would get rid of me, if I, you know--

ASSEMBLYMAN TULLY: John, thank you so much.

DR. KENNEDY: The only thing I have is I do want-- You talk about innovation and working with it, Constantina has a great example of that.

ASSEMBLYMAN TULLY: Thank you.

C O N S T A N T I N A M E I S: Thank you, Chairman Tully, and members of the Committee.

So, I wanted to just give a brief example of a manufacturer that NJMEP is looking to work with to bring to New Jersey that we hope, with the RFI that we submitted to the EDA, and our partners who work with us. So, the company that-- And HAX as well.

So, the company is called Utopia Brands. It has created a green technology actually focusing on Utopia Plastix. It is a majority women-owned, minority-owned, part veterans-owned company. They are from Ohio; they are going to be coming and visiting us tomorrow to attend one of our breakfasts with DOD folks, as well as other manufacturers who we're connecting them to.

So, this product is a plant-based composite material, a resin, that seeks to provide pretty much sustainable material for manufacturers. So, creating bins, any type of plastic; it would be that replacement. So, we know that plastic is a petro-material, but what this is going to focus on and would be very supportive for farmers in the state, anything from wheat, corn, oats, soybeans, lettuce, barley, cabbage, potatoes -- I'm sure there's a lot more plants included in that.

This product is going to provide alternatives to the traditional petroleum-based plastics, which can be used in all traditional plastic manufacturing -- not just for companies that want to create this, but also manufacturers that actually need this so they can be able to replace what they do at their facilities. The technology will help New Jersey reduce fossil fuel dependency; become carbon negative; increase sustainability. It will allow New Jersey to continue to be an innovator as a global leader and supply-chain state.

Some of our long-term competitiveness advantages for this is to help push the New Jersey green ecosystem, which Utopia would create, and NJMEP partners would support. The client is looking to the big picture in how they can support New Jersey, and, actually, be here in this state and actually grow.

We're looking to get-- This company is also really interested in how they can support the State -- State agencies -- to provide a statewide solution to the plastic bans. Look, we know clean energy manufacturing is vital in New Jersey's future, for both the economy development and environmental sustainability policy perspective. We're hoping to fulfill Governor Murphy's commitment to achieve 100% clean energy by 2050, and the Global Warming Response Act, mandated reducing state greenhouse gas emissions by 80%. New emerging technology such as Utopia Plastix should be implemented as part of our support to bring manufacturers here, and keep them here in New Jersey. We are hoping that this green, eco-friendly technology will allow New Jersey to address these issues that we're trying to address now in the State Legislature and, kind of, innovators and manufacturers and those, and all our partners here in New Jersey.

So, this is just something that I wanted to make sure that we brought up as an example, because it is important to address veterans that are looking to be innovative, working with women. One of our initiatives -- I won't go into too deeply, but if you wanted to get more insight, we can discuss as well and send you information -- is through our women's initiative. And, we're hoping to really keep them in New Jersey and have them grow here.

Thank you.

ASSEMBLYMAN TULLY: Very good.

Constantina, thank you, (indiscernible) Bergenfield Prep.

MS. MEIS: (laughter)

ASSEMBLYMAN TULLY: I appreciate it.

Actually, I called up Dr. Angela Garretson, is she here?

Oh, hi, please come up as well. I know you also are on a bit of a time crunch.

Does the Committee-- I certainly want to follow up with you, especially on the home-rule aspect, because I have a lot of thoughts on that. Does anyone on the Committee have any questions for NJMEP? (no response)

Comments? (no response)

OK, very good. You're great, and then, please--

DR. KENNEDY: Thank you; I got to run because I've got to go get yelled at by Ms. (indiscernible)

ASSEMBLYMAN TULLY: Go do your thing and then Michael will get you after this.

So, please, Dr. Garretson.

ANGELA GARRETSO N, Ph.D.: So, good afternoon, everyone, and thank you so much for having me represent NJIT.

I bring greetings from Dr. Lim, who is our new president; he started July 1. And, prior to Dr. Lim, it was Dr. Bloom who actually sat on the board of CSIT. So, it's good to be amongst so many friends.

And, thinking about -- talking about what happened with Delaware, I'm not sure how many people are familiar that in just May that NJIT, we had a company called BioCentriq, it was life sciences, and it sold for \$73 million. So, it's really proof of concept that working with industry, working with higher education, actually can really yield very positive results. But, I just wanted to remind everyone of that. That that really was something that started; we broke ground in 2015 for our life sciences building, but by 2022 we actually had a success story.

But, I would like to get into our testimony, so, thank you.

So, for our state to prosper, we must foster an innovation ecosystem where New Jersey's institutions of higher education fill critical roles that include both scientific breakthroughs and preparing a workforce that can thrive within and lead an economy driven by technological innovation. NJIT has been highly successful in achieving each of these goals. NJIT prepares students to become leaders in a technology-dependent economy for the 21st century, and we are also one of only 131 universities nationwide rated as an R1 research university by the Carnegie classification. And, this indicates the highest level of research activity -- and, this again, proof positive of what happened with the \$73 million sale.

NJIT is launching so many organizations for students and for community groups, and we serve as an anchor institution because we prepare students to thrive and strive in collaboration within our community to prepare the future workforce. And, with our institutions, we work with folks who need high-demand fields that are at the core of what is unquestionably a technology economy. All major businesses, organizations today, are driven by new and improved technologies, which bring about new products; improve product capabilities; and business process and efficiencies.

Our university founded -- it was in 1881 -- by industrialists to support the workforce needs of the City of Newark. NJIT is, again, really leading the charge with so many innovations that we embrace economic development as a core component of our four-prong mission that includes education, research, and community service. NJIT plays a critical role as a catalyst for our state, and we have an annual economic impact that is greater than \$2.8 billion. While NJIT's faculty members do conduct a great deal of

externally funded basic research, we have become an innovator because we have developed an ecosystem that matches our university's resources with the needs of industry partners.

The ecosystem, we say, has several components. The first is talent. NJIT begins its commitment to talent development in the pre-college years, and a number of our initiatives that build a pipeline of diverse and talented students in the STEM fields and disciplines. These programs are designed to enhance the pool of women and underrepresented minorities, students that are interested in STEM education. NJIT also educates approximately 12,600 highly talented students from BSes to Ph.Ds. NJIT is preparing the workforce in New Jersey for the needs for today, and also for the future. Each year, the United States has millions of more available STEM jobs that requires skilled workers to fill them. But NJIT, as our state polytech university, we continue to provide these pathways and pipelines in collaboration with numerous partners that are in this room, but also reaching out to others.

The second component is our knowledge. I'm going to jump down specifically to innovation; our third was infrastructure. And, just looking at our (indiscernible), it's the largest that we have in the State of New Jersey. But, I wanted to focus a little bit on just, for the time, with our New Jersey Innovation Institute -- NJII -- which, again, is where the \$73 million biocenter was sold from. It is a subsidiary of our NJII, but many don't know that this unique space has four divisions: health care; entrepreneurship; defense and homeland security; and professional and corporate education. This is a unique platform for applying NJIT's intellectual and technical resources to challenge and identify industry partners. For NJII, we advance

our competitiveness through our key industrial sectors by combining the vast resources of NJIT and other partner universities.

And, that's another very huge thing that we're working on now. We're really working not just horizontally, but also vertically, so that we can develop these strong relationships. NJII is a state-designated entity to manage the New Jersey Health Information Network, and it supports the statewide health-care partnership with NJ DOH and NJ DHS. A working success story of providing an industry solution managed by our health-care division. NJII fosters entrepreneurship through Venture Link, New Jersey's oldest and largest technological business incubator, and we've committed \$6.75 million to fund Highlander startups. We have been recognized as the top public university in the northeast for undergraduate entrepreneurship, according to *Princeton Review*. And, additionally, we have partnered with HAX SOSV which is focused on hard tech startups, investing \$50 million in the greater Newark start-up ecosystem. Our professional and corporate education division provides training to keep the workforce digitally relevant and technically skilled, and to serve as a source of innovation education.

And, in conclusion, we truly have modeled NJIT to a proven success story that collaborates; that wants to innovate; and to develop our ecosystem that accelerates development of startups, early stage, and scale of companies. And its results -- our results -- are product creation; process improvement; job creation; economic development in key industry sectors. We are serving as a vital role, as a catalyst for innovation, and I thank you for the opportunity to share just a couple of our success stories.

ASSEMBLYMAN TULLY: Thank you, Dr. Garretson.

And, there's certainly a lot I'd like to follow up on, and I'll follow up with you in a further meeting, because that's a fascinating testimony. I want to hear more about the great work that NJIT is doing.

Does anyone on our Committee have any questions?
Comments? (no response)

Very good. Doctor, thank you.

DR. GARRETSON: Thank you so much. I'll make it to D.C.

ASSEMBLYMAN TULLY: Yes, well, I'm trying to get through everybody.

I think our last testifier is under a time crunch here: Michael Egenton, with the New Jersey Chamber of Commerce. And, I'm going to call Aaron Price with TechUnited as well.

Gentlemen, thank you so much for joining us here today.

MICHAEL EGENTON: Thank you, Chairman.

For the record, I'm Michael Egenton; I'm the Executive Vice President with the New Jersey State Chamber of Commerce.

I'm really here not to take up time but to really-- I asked one of our board members, Aaron Price -- and TechUnited was mentioned by several people today -- to talk about the theme, the subject.

I will say, many of you know me, and I've worked with several of you in my 29-year career at the State Chamber. This is an important topic. A lot of my colleagues that are sitting behind that have already testified, whether we're trade associations, businesses, the agencies -- we're all working towards the same goal: innovation and technology; manufacturing; all things economic development is important, with the end goal of growing jobs in the economy.

So, I just want to say the State Chamber continues to stand ready to work with all of you, whether the outcome of this is legislation or maybe a little tweaking in some of the regulatory agencies to move the needle.

The one last thing before I hand it over to Aaron for his comments: As I was sitting there brainstorming, you know, one of the best marketing we ever had in the State of New Jersey was Governor Tom Kean walking along the Jersey Shore. And, I see you Assemblyman Kennedy, nodding your head. He said, “New Jersey and you: Perfect together.” Maybe we update that and ask the Governor if he would come out of retirement and be in one of these facilities and say, “New Jersey and innovation: Perfect together.” Just sitting there, throwing it out there. We need to really up the ante if we’re going to market and be a frontline player in all this.

And, with that, let me hand it over to Aaron Price, and he’ll provide some comments as one of our board members.

Thank you, Chairman.

ASSEMBLYMAN TULLY: Thank you, Michael.

AARON PRICE: Thank you, I appreciate the time. Thanks for having me; it’s an honor to be here on behalf of the Chamber, as well as the CEO of TechUnited:NJ.

For those of you who are unaware, we are New Jersey’s trade group, a nonprofit that represents entrepreneurs and innovators in New Jersey.

I am an entrepreneur from New Jersey myself, and, so, this topic is very near and dear to my heart, personally. I was selling things to my friends back in high school -- legal things -- but selling them nonetheless.
(laughter)

UNIDENTIFIED SPEAKER: For the record.

MR. PRICE: Yes. The things on the record were legal.

Started my first real tech business in 1998, which was one of the first online food-ordering service businesses, like, you know, a Grubhub or a Seamless today. And, while we did reasonably well, processing over 3,000 orders a month while we were still college students, we lacked mentorship, guidance, and investment -- which is exactly what has become part of the mission of TechUnited. Because we could have had a significantly greater -- I believe we could have had the market leader position, had we been surrounded by the right resources.

And, so, fast forward to what was kind of an isolating career on an island while my friends took more traditional career paths, I started the New Jersey Tech Meetup, which grew to the state's largest gathering of entrepreneurs -- it still is, at over 8,000 entrepreneurs -- that inspired the Propelify Innovation Festival, which is what *Forbes* calls the, "South by Southwest of the Northeast," where we bring together over 8,000 entrepreneurs and innovators each year for all things entrepreneurship and technology. And, we merged three years ago with what was the New Jersey Tech Council, that we've rebranded as TechUnited:NJ. Because, as some of the testimony you've heard today, we believe the magic is in working together and uniting the technology community.

And, so, in stepping into this role a few years ago, we looked at what are some of New Jersey's strengths. And, something I think we need to own, which is we live in the shadow, specifically, of New York City, and how do we compete with one of the top three markets in the start-up community? New York, Massachusetts, California, take about 90% of the venture dollars,

\$200 billion a year going to venture capital. The other 47 states compete for just about 10% of that pie.

We all agree on the talent opportunity here; we all agree on the incredible colleges and universities and corporations that were top five -- I know you all know these statistics, the top five in the Fortune 500s. So, why are we still hanging onto the days of Bell Labs, and not inventing more of the future at more scale -- we're certainly doing it in pockets -- at more scale.

And, so, we believe we need to lean into a few areas of focus. We've launched what we call our Better X programs. So, we've partnered up with PSEG, in what we call our Better Planet Program, which is, how does tech play a role in climate change? If you're working anywhere in the world on that, we can accelerate that relationship. We give away a cash prize each year; we've given away now over \$300,000 over the last few years. That's a non-dilutive grant to several startups. We do the same thing with Verizon and Cross River Bank on what we call the Better Connected Program, which is, if you're working in smart cities, we can accelerate your business here with those relationships and with Robert Wood Johnson-Barnabas and Labcorp, in what we call Better Wellness. So, if you're a startup in the health- and life-sciences space, we can accelerate your business.

While I agree wholeheartedly -- I live in New Jersey -- that it is a great place to be and live and to raise a family. I think we need to sell the state on the business differentiation: That you can build smarter, better, faster, by engaging in this community. As an entrepreneur, I would have flown anywhere in the world -- and did many times -- to do whatever it took to accelerate my business. And, I think we have that value position on our doorstep; we just need to aggregate it the right way.

So, I would encourage you, one, to invest in programs like our Better X programs to drive awareness, as came up earlier, that many of these things exist; that we can give startups a leg up in a variety of industries; that we can inspire, train, educate, and mentor young company entrepreneurs. It doesn't necessarily mean young entrepreneurs, though it tends to be. But, that we can give people opportunity of how to build a business and what's authentically best in their community like South Jersey, like we talked about before. It's not a spray-and-pray model. We'd get an authentic fit for whatever it is that's happening in these areas.

So, we believe that the industry focuses potentially could be, and are, climate; life sciences; fintech, where there's quite a bit of activity; logistics -- having, now, the most active port in the country, in case you were unaware -- and a few others. But, those stand out, certainly, as verticals.

I think as represented by the organizations that are here, our view is that every company is a tech company, whether one likes it or not. Whether you are purely a tech business or you are empowered by tech, we all, I believe, would agree that the future is driven by technology enablement. We are tired of seeing these things happen, where New Jersey is in the bottom half or the bottom third of these inevitabilities. We do believe that the collaboration; the right funding; the right awareness; can flip this model around, and we can take the assets that are already here and make them a significant strength.

With that in mind, we look to things like the Startup New York program. It's tax-free for 10 years for certain locations in the State of New York. We believe we should make the entire state a startup zone, tax-free for 10 years. We currently offer, as Kathleen mentioned earlier, a 25% Angel

Tax Credit Program. It's competitive. We believe we need to be an order of magnitude better than what's happening to our biggest competitor, which in this case, would be New York. So, consider making that 75% tax mean.

The issue is, how do we keep and inspire entrepreneurship, especially new company formation, to happen here? I think we do a good to great job in incentivizing growth stage and enterprise business to get involved, but, we're losing too many of our entrepreneurs to other markets, because they see the value I talked about earlier. The ease of which it is to raise capital, hire talent, not to mention the cultural factors built into other markets, make it a very challenging place for New Jersey to thrive.

So, we believe investing in the Better X programs with industry focus to raise more awareness, mentor more young entrepreneurs. Bonnie Watson Coleman helped us secure \$1 million funding; we'd love to see the State get involved in that program as well, helping incentivize further, as the Innovation Evergreen Fund has done; corporate involvement with the innovation community and the grassroots efforts that are supported there. And, doing more to keep our entrepreneurs here. The average age of the most successful entrepreneur is 42. The average age in New Jersey is 40; the average age in New York City is 37. So, we've got a little bit of a head start in keeping those entrepreneurs who often go at that several times over to be successful here.

As I mentioned before, we -- these advancements in technology are inevitabilities. We hope that we can help embrace them and empower the entrepreneurs that exist in the state to have those things happen here first.

Thank you very much, I'm happy to take some questions.

ASSEMBLYMAN TULLY: All right, Michael, thank you. Phenomenal testimony, and a lot of great ideas.

MR. EGENTON: Now you know why I brought him.

ASSEMBLYMAN TULLY: Exactly.

But, for both of you, and, particularly, for the NJBIA Innovation Corps -- because you kind of brought up where we're regarding Angel Investment, and how can Angel Investor programs work and how can we expand or alter them to improve the start-up community here in the state? Because, that is a wild statistic that I think a lot of people don't know as far as where a lot of the investment goes, particularly to three states, and where we're at a competitive disadvantage.

MR. PRICE: My counterpart in New York City, the Tech NYC organization, they talk about having about 1,200 organized funding mechanisms -- funding groups, specifically -- mostly venture funds, some Angels. We have, even if we brag a bit, maybe 100. So, there's certainly a need to find more organizations and incentives around driving Angel Investment.

But, there's a flywheel effect in that we must also then make sure it's attractive enough to keep the entrepreneurs here. Twenty percent of Google's New York City workforce lives in New Jersey. Most of the dinners I go to in New York where we talk about investment, half the table, if not three quarters, are people who are commuting over from New Jersey. So, if we can incentivize them to make it much more attractive to put their dollars to work, which is partly what I'm talking about with this start-up zone program, I think it would be very impactful.

ASSEMBLYMAN TULLY: Take us through a little -- I know you've mentioned TechUnited, but, take us a little bit through about how you help companies and the start-up economy here, and start-up innovative companies here in New Jersey. Because I think there's really not a lot of organizations like yours in the state -- particularly, I know, you have more of a northern focus. You try to help everyone you can, but, I think to the Assemblywoman's point, how do we help foster more organizations like yours where we're kind of in more of a team environment in helping?

MR. PRICE: Well, first, I point out -- I hope you don't foster more or new organizations. I think all of those here and these that exist--

ASSEMBLYWOMAN TULLY: How do we expand, yes--

MR. PRICE: --because I do believe that's part. It's a big state -- this has come up a few times -- the more we can work together to have a one-plus-one-equals-three effect is very, very important.

What we do is, depending on-- We represent the full life cycle of business, so depending on where you are in the ecosystem or the life cycle of your business, it depends on what our offerings are. For an early-stage company, it's often about creating awareness of what they're up to about bringing in potential talent for their reorganization, connecting them with funding sources, and connecting them with government and corporations.

So, a good example, I talk about our Better Planet competition. We're going on our fourth year of this competition. Ralph is -- the former CEO -- has joined our board; he's talked deeply about the need for big energy -- excuse me, big data -- to play a role in the energy space. Right, so how does tech play a role in his world? So, we have issued these tech challenges, solicited several hundred applications of companies from around the world,

but certainly a concentration in New Jersey. Of those who are looking to accelerate their businesses in New Jersey, they have a direct line -- literally, Ralph will pick up the phone for them, he's very interested to make sure he has a competitive edge in his business and how tech plays a role.

So, TechUnited, in his case, we vet -- right, he can't speak to all of them, so we have a judging committee and a selection committee -- we vet what makes sense for them to analyze as a potential pilot program or investment, and make sure that we can accelerate that relationship. If you're not aware, if I was an off-the-street entrepreneur in the energy space, it likely would take me nine months or a year to get a meeting with the right folks at a place like PSEG. Working with TechUnited, we can make that happen probably in three months -- maybe in a month or less, because there's an ongoing cadence to the way that we operate those programs.

So, we do that with several -- I mentioned Verizon, Labcorp, Robert Wood Johnson-Barnabas, Cross River Bank. Audible has been very supportive; we have a focus there in supporting the retail business in Newark. So, depending on your business, we see, how can we accelerate, make you build smarter, faster? That is our primary goals. You can sort of reverse engineer that for the big corporates. We help-- There are quite a few amazing corporations that, frankly, may seem a bit boring, but when you look into what they're doing from an innovation perspective, it's totally incredible.

So, we also help tell some of those stories as best we can, but to the marketing message point earlier, I think it should be louder and wider.

ASSEMBLYMAN TULLY: Well, that was going to be my question. Say I'm a -- I actually like that term, off-the-street entrepreneur. How do I find you?

MR. PRICE: That's a good question.

We get decent coverage from things like ROINJ and the NJ
(indiscernible) Center--

UNIDENTIFIED SPEAKER: It's on milk cartons, or something.
(laughter)

MR. PRICE: Milk cartons, and the beach campaign.

We're very active on social media. We're very-- With this marketing campaign message that came up earlier, frankly, I think we need to meet entrepreneurs where they are. And, that means things like Instagram and TikTok -- in the feed, literally. And, so, if pursuit of a marketing campaign is potentially on the table here, I think we need to be very modern about that approach. Because we do have a branding issue. There is a major -- it's a reality that New York has a "cool factor" that attracts young entrepreneurs in a way that New Jersey currently doesn't. So, you find us often through some of those things. Some of you may have received a message of me, like, playing guitar, about a song about New Jersey, about the tech community. We try to make things a little bit fun and different. We run this 10,000-person event in Hoboken; we do several other things. We leverage our board -- in some cases, influencers -- to try to spread that message. Some of you may know people like Gary Vaynerchuk, Arianna Huffington, other folks have been part of our community and helped spread the word.

But, it's a start; there's a long way to go.

ASSEMBLYMAN TULLY: I appreciate that, thank you.

Does anyone from the Committee have any questions, comments?

ASSEMBLYWOMAN MURPHY: I do.

ASSEMBLYMAN TULLY: Go ahead.

ASSEMBLYWOMAN MURPHY: OK, thank you.

Thank you. And, first, I have a comment, and then I have a question.

The comment is, everyone here knows I'm huge in technology, right? They have all these bells out there. And, I firmly believe, even today, it has proven a point that if we do not have better technology, faster speed - - whether it's broadband, wireless -- and if we do not bring our technology up to the 21st century, no matter what we do here is not going to be successful, as compared to other states, because we're already behind in that field.

A few people before you have mentioned about the Angel Investors. Now, the bill was passed a while ago; kind of older, it's not a brand new bill, it's close to like, eight-nine years ago. I remember Assemblyman Young had (indiscernible), was huge on this. And, I'm sorry Assemblyman Moen couldn't be here either, but I will talk to him. Is that a program that we need to readdress to make sure that that's brought up to where we are today? We've gone through COVID; we're going through inflation; we're going through recession; our businesses, we've lost a lot of businesses during COVID. Manufacturing needs to be brought up. And, we'll go back to South Jersey, Burlington County, including our Burlington Township, our Burlington City, our Florence areas we've been building up with manufacturing.

And, we had this discussion at lunch. The investors are important to these -- to building on what we have. Do we need to readdress that bill to assure that we're brought back up to the 21st century when it

comes to investors and make sure that we're targeting the right investors for these programs?

MR. PRICE: So, there's a chicken-and-egg component here.

ASSEMBLYWOMAN MURPHY: OK.

MR. PRICE: If there aren't enough founders, the investors could have all the incentives in the world, and they don't have a place to put their money.

So, I think the answer is, absolutely, yes, *and*, what does it mean to get the entrepreneurs to thrive and how do we help them thrive and support grassroots organizations and many other things, and make sure that they have the support and resources that they need?

I also would say that -- I would encourage you to think about that approach as an order of magnitude better, right? If New York is doing 25%, like, let's make ours 80%. Let's make something that will get press in a place like *The Wall Street Journal* that people say, "We need to move here," that will get venture capitalist partners -- of whom I have many friends -- who say, "We better set up shop there, because it just became--" Their goal is to invest money at a return, and if we could give them a 2X return compared to other markets, they will force their entrepreneurs to find places -- or, they will spend much more time in market looking, digging up, interesting entrepreneurs.

I was at a dinner two nights ago with an entrepreneur who has raised over \$100 million. I said, "Did you find any of this money in New Jersey?"

"No, we couldn't find it."

There were certainly a few opportunities; it's a blanket statement, but he raised from one of the best investors in the world in (indiscernible) across the country. There's no reason that that money exists in New Jersey; those kinds of investors, individually, are here. I think if we gave them a nudge, that was something that could not be ignored; we would capture quite a bit more of that.

ASSEMBLYWOMAN MURPHY: The sustainability for the Angel Investors -- I think that's huge.

MR. PRICE: Well, so -- I'm sorry to interrupt you.

We've been thinking about how, in real estate, the 1031 exchange allows for a stepped-up basis to have tax-free gains on capital. Part of what the start-up zone's proposition is that we're talking about is how can we create a similar structure in the technology and start-up community to incentivize investors to put money to work, and to continue to put money to work in market, to have that same sort of stepped-up approach?

ASSEMBLYWOMAN MURPHY: Good; thank you.

MR. EGENTON: And, Chairman, I just want to add one quick thing, Assemblyman.

You know the Legislature has revisited issues -- there's nothing wrong with revisiting to see what works, what doesn't work. So, I agree with you that we've done it on several issues. That might be part of your to-do list.

ASSEMBLYMAN TULLY: I appreciate it, thank you.

Assemblyman.

ASSEMBLYMAN DePHILLIPS: So, particularly with the last incentive piece -- that, by the way, Aaron, this was a brilliantly presented

piece of testimony, so, I thank you for your insight and your knowledge and just the way you present your ideas; it's excellent.

MR. PRICE: I appreciate that.

ASSEMBLYMAN DePHILLIPS: I am, particularly with the last incentive that you responded to the Assemblywoman -- I would be very, very supportive of efforts, Michael -- and Aaron -- in the Chamber with legislation, with bills. Because the only way we're going to make New Jersey what we want with respect to entrepreneurship is to continue to -- not continue, to start the process of incentivizing and bolstering the private sector. We have an enormous public sector economy in New Jersey -- too big -- and I would be very supportive of what you're speaking on.

And, so, I leave that with you, Michael.

MR. EGENTON: Thank you.

ASSEMBLYMAN TULLY: Thank you.

Please.

ASSEMBLYMAN KENNEDY: In a previous life, I was the Mayor of Rahway for 20 years -- torture. (laughter)

And, one of the things that -- I got elected, I wasn't involved in politics, and I had this young guy that wanted to be a campaign manager, Jim McGreevey -- he wound up becoming the Governor after that. So, we gave him his start.

ASSEMBLYWOMAN MURPHY: And, you did a fine job at that.

ASSEMBLYMAN KENNEDY: We won the campaign 2-1, and the point of the story was that right when I got elected, Merck & Co., which was our largest employer in the town, was moving out of the state. They were

moving out. And, so, we came up with a concept. We re-zoned the entire area -- it was very controversial. Some of the people that were opposed to it were the first ones that sold them their house. So, we created a research-and-development zone.

And, zoning is an important thing in New Jersey. If you wanted to zone an area, there's a lot of wide-open space where pharmaceuticals and these types of guys are already there. You should encourage those communities to look at re-zoning on a greater-- It gives you flexibility and the ability to do it.

Merck made it their world headquarters. It didn't hurt that Dr. Roy Vagelos, who was the CEO, was a Rahway High School graduate, so it was easy to have the conversation. And, it wound up, for the city, stabilizing property taxes for 10 consecutive years. It was a major home run. And, the loss of the 30 or so homes in the area -- I think everybody there was kind of happy when they sold, because there was one or two holdouts for a long period of time that, ultimately, as soon as they died, their kids sold the thing right away. There was one that remained in the middle of the whole complex for a long period of time.

But, the point of it is that rezoning is probably your best tool in the toolbox to get these companies to grow.

ASSEMBLYMAN TULLY: OK.

Anybody else?

MR. PRICE: Can I make one final, please--

ASSEMBLYMAN TULLY: Please.

MR. PRICE: I just want to point out. What the EDA and what Judith in the CSIT do -- first of all, in the last five years, it made a dramatic

difference and a huge move in the right direction. I think that the work that they're doing is incredible; I also think there's significantly more opportunity there.

So, I want to be clear, I don't think-- This testimony is not meant to be critical of what exists. I think there's quite a bit more white space in front of us, we can work together.

MR. EGENTON: Stand on it, right?

MR. PRICE: That's right.

MR. EGENTON: Yep.

ASSEMBLYMAN TULLY: Wonderful, we certainly appreciate that.

Thank you so much, Aaron.

MR. PRICE: Thank you so much, Chair.

MR. EGENTON: Thanks, everyone.

ASSEMBLYMAN TULLY: All right, next, we have Kim Case with the R & D Council, Haskell Berman with Innovation New Jersey, and Kyle Sullender with the NJBIA.

Please step to the table here. If you can all fit, it's a very small table, there.

UNIDENTIFIED SPEAKER: Ladies first.

K I M C A S E, ESQ.: Thank you, sir, thank you.

ASSEMBLYMAN TULLY: OK, wonderful.

Kim, why don't you start us off?

Thank you for being here.

MS. CASE: Thank you, Chairman Tully, and the rest of this esteemed Committee for allowing me to be here today.

I am the Executive Director of the Research and Development Council of New Jersey. The Council is a nonprofit organization composed of industry, academic, and government members from New Jersey's pharmaceutical, telecommunications, and chemical industries -- industries that are all vital to the state's innovation economy. The Council's mission is to foster collaboration among leaders across these sectors to drive New Jersey's innovation economy.

Our group was started in 1962, although, Aaron just mentioned it, by Bell Labs, one of the world's leading research organizations. Still situated in Murray Hill in Union County in New Jersey, Nokia Bell Labs has an incredible story of innovation dating back to the transistor, the device that all modern electronics are built off of. It also has nine Nobel prizes under its belt. No other private sector business can compete with Bell Labs when it comes to Nobel prizes, the leading world prize for discovery. The predecessor to Bell Labs in New Jersey is Edison Labs, led by Thomas Alva Edison, the father of modern-day research-and-development method. Edison was the leader who built New Jersey's reputation for cultivating innovation, and we have many metrics that illustrate our culture of innovation has stood the test of time, including the fact that New Jersey has more scientists and engineers per square mile than anywhere else in the world.

Our sheer number of STEM professionals is key to maintaining a robust innovation ecosystem. But, investment in talent development strategies is crucial. Beginning in 2017 and lasting through 2027, the number of STEM jobs in New Jersey will grow by 9%, specifically in computing, engineering, and advance manufacturing. So, an educated STEM-focused workforce is essential. Talent is critical to the start-up ecosystem -- the focus

of today's testimony -- and, for as long as the Council has been operating, it has supported initiatives that contribute to the talent pipeline.

We have six STEM learning ecosystems in New Jersey. These ecosystems include the South Jersey STEM and Innovation Partnership, located in Atlantic, Camden, Cumberland, Gloucester, and Salem counties. We have the Delran ecosystem in Burlington County -- and, I just want to acknowledge Assemblywoman Murphy's support for this ecosystem; the HSMC ecosystem in Hunterdon, Somerset, and Mercer counties; the Newark STEAM Ecosystem; the Liberty ecosystem in Hudson County; and NJ NEST in Bergen County, which many of the Committee members here were at in the spring. Each ecosystem brings together formal and informal learning and a community of region through the collaboration of organizations, institutions, and businesses. These ecosystems are cross-sector partnerships that leverage resources to ensure high-quality STEM learning experiences are available to all. Equity is key.

Just a few highlights from our ecosystems include the development of a cybersecurity pathway in Bergen County; HSMC and SJ (indiscernible) math and science accelerated learning K-8 programs to address pandemic-related learning loss; Delran's million-dollar fabrication laboratory that serves as a community hub for innovation learning; and Newark's Bridges to STEAM virtual career program that connects classrooms to professional speakers.

Now in its ninth year, the Governor's STEM Scholars Program was developed to counter New Jersey high school student out-migration. GSS recruits the state's highest-achieving high school and college students and showcases the state's STEM opportunities to them. We believe that by

establishing profound relationships between these students and STEM in New Jersey, we will keep these students here and secure our STEM-talent pipeline and the investment we have made in their K-12 education. This year's Governor's STEM Scholars classes are our largest yet, with 128 students from 20 of New Jersey's counties. We are proud that this class represents the rich diversity of New Jersey, with 64% of the scholars identifying as female, and 83% as students of color.

I also couldn't be here today without mentioning that March is New Jersey STEM month, a month-long celebration that highlights the Garden State's incredible accomplishments in STEM. 2023 will mark the sixth year of New Jersey STEM Month, and with this initiative, we have impacted over 100,000 learners.

This past fiscal cycle, the Council was awarded State funding to build capacity scale and replicate our STEM programming, so that we have an even deeper impact in the state and through New Jersey's STEM talent pipeline. We are excited to use this funding to add two new additional ecosystems in the spring; to expand the number of Governor's STEM scholars; and to offer additional funding for more ecosystem, high-quality STEM learning programs. I will share the RFP with the Chairman to share with you, if you have anyone in your district who is interested in becoming an ecosystem.

While these programs continue to grow and thrive, we always know that more can be done. We hope to continue to receive State funding in FY24 so that we can reach more learners and continue to contribute to the talent pipeline.

I started with Bell Labs in Edison, because it's hard to really know where you're going if you don't know where you came from. The history that New Jersey enjoys because of Bell Labs in Edison is indicative of where we are today as a leader in innovation, and it's important to know that we know these stories so we can celebrate our history and know the foundation of our present. It's also important because, as leaders in New Jersey, we should all be proud of who we are and boast of our successes, and innovation is certainly one of them.

Thank you.

ASSEMBLYMAN TULLY: Thank you, Kim; appreciate it.

OK, Haskell.

HASKELL BERMAN: Chairman Tully, members of the Committee, thank you for the opportunity to speak with you today.

I am Haskell Berman, Senior Vice President for State Affairs at the HealthCare Institute of New Jersey, otherwise known as HINJ, the state trade association for the research-based pharmaceutical and medical technology companies in the state.

Today, however, I address you as one of the founders of Innovation New Jersey, a coalition of business, higher education, and government, working to build a competitive innovation ecosystem; encourage greater collaboration between industry and academia to keep research and research dollars in New Jersey; and promote STEM education.

The impetus for creating Innovation New Jersey was seeing New Jersey-based companies move their R and D to innovation hotbeds like the 128 Corridor, Research Triangle, and northern and southern California. To grow their economies, these states learned how to leverage the research assets

and capabilities of their higher education institutions to support industry research.

While New Jersey stood still believing the innovator companies who call New Jersey home for more than 125 years, but never leave, New Jersey being the home of chemical, pharmaceutical, and telecommunications -- among others. In its report, *What is an Innovation Ecosystem?* The National Science Foundation calls innovation, “The fundamental source of significant wealth generation within an economy.” The report defines innovation ecosystems as a model of, “The economic dynamics of the complex relationships that are formed between actors or entities whose fundamental goal is to enable technology, development, and innovation.” Given a higher growth potential that high-tech industries typically offer, the NSF report says that a state government has a “strong incentive” to play in developing a nurturing innovation ecosystem that spur job development and economic growth.

Innovation New Jersey was launched in July 2010, with the intent of bringing industry and higher education together to promote greater collaboration, staunch the out-migration of R and D, and keep research dollars in New Jersey. We were immediately challenged by the previous administration to develop a plan to address our goal. We spent two years conducting industry-specific focus groups and steady established innovation ecosystems around the country. And, in 2013, we issued our report, *Building Bridges, Breaking Down Barriers*, which you have a copy of.

I won't go into all the findings in the report, in the interest of time, but what I do want to call out is businesses would prefer to collaborate with partners who are in proximity -- if they know about their resources,

assets, and expertise available nearby; to your point, Chairman, about how to get the message out. We've made a great deal of progress over the past 12 years to build a comprehensive, competitive, innovation ecosystem, and reaffirm New Jersey's historic position as a global innovation hub. With many of Innovation New Jersey's recommendations being implemented, our university is creating infrastructure to engage and support in (indiscernible), and the State taking action to create an environment and infrastructure to support its innovation economy.

Some of our key accomplishments and other transformations made over the past 12 years around the state include our most ambitious recommendation, our report, was to call for a centralized directory of university researchers and resources. We then spent five years after publication of our report advocating for state funding, which is now the *ResearchWithNJ.com* database, which you heard about. Then, we were excited to read yesterday the expansion of the database and its move to the Commission on Science, Innovation, and Technology, which was the natural fit for it.

Two, our universities have established business engagement offices, or other organizations like NJIT's New Jersey Innovation Institute, which you heard about, to work with industry.

Three, the State integrated most of UMDNJ with Rutgers to establish a life sciences innovation infrastructure to support the life sciences industry and maintain its standing as the "medicine chest of the world." New developments on the horizon that we look forward to include completion of the Hub in New Brunswick, which you heard about; construction of the new Rutgers Cancer Institute; and the partnership to establish the new Virtua

Health College of Medicine and Health Sciences of Rowan University that will also create a life sciences research hub in South Jersey.

And, of course, we have to thank the Speaker for his vision in establishing this committee five years ago. It's an acknowledgement of the importance of innovation to our economy. Perhaps most importantly, we've built a community at Innovation New Jersey. We share best practices; we network; and members collaborate. We meet at least twice a year, and as AST members, you do get our invitations, and we were privileged to have the Chairman speak at our June meeting. We also publish an e-newsletter, which has a circulation of 3,300 -- and, again, every legislator gets that as well -- with the latest STEM news and R and D updates from our higher education community; State and Federal agencies; state trade groups; and national nonprofits active in the innovation space. My colleague is also active on Twitter and LinkedIn, pushing out our news, and sharing updates from our coalition members. And, there are several here, including the R&D Council and BIA.

When you have time, you can go through our full report, but a few recommendations I would like to pull out, and some new ones from our members. One is the establishment of a state council on innovation, to advise the administration and the Legislature on how to manage and promote the state's innovation ecosystem. Illinois has such a council -- it's in our report -- and we had an informal one under the Secretary of Higher Education in the previous administration.

Two, continued funding for maintenance, and additional funding for promotion of the research with *NewJersey.com* database.

Three -- and again, a few, to your point, Chairman, about getting the message out -- institutionalizing our e-newsletter. It's now done by a colleague of mine on his own time. He started it when he was an intern at BIA 10 years ago; he took it with him. If he no longer has the time to put it out, it dies; so, that might be the one media devoted to innovation in New Jersey that goes out on a regular basis. We should institutionalize that.

We should attract more regional and national professional conferences to establish relationships and showcase the state's R and D resources. Also, in our report, you'll read about adopting the New York and Pennsylvania models to designate centers of excellence: State-labeled authoritative sources for research, training, and other work in a specified field, which typically feature collaborations between the state, academia, industry, venture capitalists, and other private- and public-sector parties. Again, further details are in our report.

And lastly, develop brands and campaigns for certain regions and industries, such as pharma on the Route 287 corridor, to make New Jersey a recognizable innovation destination like Research Triangle and Silicon Valley. You hear those monikers, you know where you're talking about.

So, in conclusion, New Jersey has all the component parts to have a thriving, competitive innovation ecosystem, but more investment, coordination, and promotion is needed to raise public awareness and attract research.

And, I want to thank those here who are members of the Coalition for all their work over the last 12 years, and, again, I think to show that there is a community out there, and it's looking for leadership. I was talking to Kim the other day about STEM month, so I'm holding a special

Innovation New Jersey virtual meeting in two weeks for Kim to talk about STEM month; make a presentation; see who else wants to participate. And, within five minutes of sending out that invitation, I had two dozen people RSVP. Pete, you had about 45 people when you spoke back in June, so there is a community out there that wants to work with you and, as do we.

So, whatever we can do, please let us know.

ASSEMBLYMAN TULLY: Wonderful, Haskell, I appreciate it.
And, Kyle, BIA.

KYLE SULLENDER: Thank you, Chairman.

Again, my name is Kyle Sullender, I am the Director of Economic Policy Research with the New Jersey Business and Industry Association.

Of course, I want to start, on behalf of the entire organization, thanking Chairman Tully and the other members of the Committee for inviting us to testify today about New Jersey's innovation economy and, also, to provide an overview of our recent Indicators of Innovation Report.

Like many in the room, it's long been a vision of NJBIA that New Jersey reclaim its stature as the nation's predominant innovation state. Cumulatively, the United States spends more on research and development than any other country in the world. The most recent figure I had available was more than \$657 billion in 2019. And, while this investment has a ubiquitous positive effect on our nation's economy, we also know that states and localities have much to gain from developing an innovation ecosystem within their boundaries.

For these reasons, NJBIA has produced a series of in-depth reports, which aim to analyze the strength of New Jersey's innovation economy, with particular emphasis on how that economy compares to our

regional neighbors, given that these neighbors will be our direct competitors in attracting talent, capital, and both new and existing businesses. As such, NJBIA released its third iteration of its *Indicators of Innovation* report series in September in this year.

I'd like to highlight some of the findings of that report, and, before I begin, unfortunately, I think the overarching theme really gets to what Chairman Tully said at the beginning of this Committee hearing, which is the unmet potential of the state. And, I'll highlight some of the reasons why that potential is there and, certainly, somebody else at this seat had mentioned all of the great initiatives that have already taken place and the great programs. We certainly don't want to minimize those, but to continue to look at the ways that we can improve and move our state forward in the innovation space. In addition to that, I want to take a moment to highlight the several instances where New Jersey continues to be not only an outlier in our region but on the national stage as well.

A quick background on the innovation report: It is comprised of 12 indicators in three areas -- which, I and others have already alluded to -- that's capital talent and business. We score each state based on their performance relative to the rest of the region. For the purposes of this report, that's Connecticut, Delaware, Massachusetts, Maryland, New Jersey, New York, and Pennsylvania. Because this study does not seek to determine which indicators, if any, are more important than others, we don't weight these scores in any way; we just tally them up and then compare. Overall, New Jersey scored tied for fifth in our region with Connecticut with 41 points, trailing Massachusetts, New York, Pennsylvania, and Maryland, respectively,

in order from first to closest to New Jersey, with only Delaware scoring fewer points than New Jersey and Connecticut.

In the interest of brevity, I won't go through all 12 indicators, but instead, I'd like to highlight some of the key areas for concern from this analysis, and I'll also highlight some of the positives as we move forward. One is, New Jersey ranks fifth in the region for venture capital assets under management. We've talked a little bit about the venture capital space already this afternoon, and was the only state to show a decline in assets under management from 2010 to 2021 -- that's based on statistics from the National Venture Capital Association. New Jersey was also the only state over the past decade to show a decline in state research and development expenditures, according to the National Center for Science and Engineering statistics. I will note that New York continues to spend more on research and development than all six other states in our region combined.

New Jersey continues to experience a greater net loss of first-time, degree-seeking, post-secondary students than any other state in the nation, according to the National Center for Education statistics. It's a net loss of over 27,000 students. And, New Jersey ranked last in the Tax Foundation's 2022 State Business Tax Climate Index for the seventh consecutive year.

I noted positives, and I noted room for growth. I want to make sure that I highlight our state already possesses so many assets and qualities that are necessary to be home to a successful innovation economy. We have a strategically advantageous central location in the northeastern United States; a nation-leading K-12 education system; several highly ranked institutions of higher education; and a highly skilled workforce. Improving

in areas where New Jersey not only trails but places as a national outlier are key to taking full advantage of these assets and improving our ability to attract capital talent and business.

Finally, it is critical to highlight -- as I often do when I speak about this report -- that the analysis does contain positive news, especially with regards to developments in the last several years. The development and growth of an innovation economy will not and cannot occur overnight. And, we're careful throughout the report to acknowledge that fact. One note that I will make of course is given the availability of the data that we're working with coming from a variety of sources, some of the figures that we use despite being the most recent figures available are already running a couple of years behind. You heard me reference a statistic from 2019 already, going back three years. Unfortunately, that is the most recent figure available.

And, there have been many key developments in our innovation space in just the last couple of years that we hoped to see positive results from as we move forward. A couple that I'll highlight that are directly related to previous recommendations that NJBIA has made include the reinstatement of a corporate tax incentive program; the creation of a program to increase state investment and venture capital space with the Innovation Evergreen Fund; and the generation of new public-private partnerships, like the New Jersey Pathways to Career Opportunities Program, to continue reinforcing our workforce-development pipeline.

As we look ahead, NJBIA has outlined a series of additional recommendations to continue to grow our innovation economy. I know I'm already getting the red light, so I won't go through each from here--

ASSEMBLYMAN TULLY: No, no, please.

MR. SULLENDER: But, I do want to highlight a few key ones, and of course they're all present in the written testimony that I've submitted, as well as in our report, which I'm happy to follow up with.

One is to pass current legislation that's been introduced to modify the State's R and D tax credit, and bring the program more in line with those in states like Massachusetts, New York, and California. Another is to continue increasing funding to the Commission on Science, Innovation, and Technology to continue to help small business and start-up generation in the state.

With regards to out-migration of students, we recommend continuing to increase in annualized funding for the innovation and research fellowship program to help the State retain its promising researchers in critical industries. We also recommend the continued examination of the effectiveness of New Jersey's tax incentive programs, like I mentioned a moment ago, as well as an amendment to the Angel Investor Tax Credit program, which I think we've already addressed during this hearing, to increase the incentive in investments in the state's high-growth and smaller companies.

In summary, NJBIA is committed to recreating a thriving innovation ecosystem here in New Jersey, and to help meet some of that unmet potential that we've talked about this afternoon.

I want to thank you all again for the opportunity to submit and provide testimony today, and, of course, I'm happy to answer any questions now or in follow up.

ASSEMBLYMAN TULLY: Sure.

Thank you, everybody, for taking the time today and being here.

Kyle, just to let you know, the R and D tax credit is actually moving through this Committee, so, I expect that to be coming up very shortly.

MR. SULLENDER: That's fantastic. Thank you.

ASSEMBLYMAN TULLY: So, that progress report.

And, again, I encourage all my colleagues to read NJBIA's innovation report. Certainly a lot of great ideas to it.

Only because it came up a couple times here, and I know it's something of particular interest, can you talk about how the Angel Investors Program works, and the best ways to expand or alter to improve kind of the start-up ecosystem here? And that's really for the group as well, but I know it's particularly in your report.

MR. SULLENDER: Yes, sure, of course.

So, I know we've referenced it already, so, I'll save some of the kind of background explanation. Obviously, the Angel Investor tax credit helps incentivize investments in some of those smaller high-growth companies.

In the areas that we've looked at, one of the opportunities for advancement that we've identified, is currently -- I think the program requirements require the company receiving that Angel investment to have fewer than 225 employees. What we've identified is that that kind of leaves open this gap that if you're going to make that investment, you're almost incentivized to skew towards those larger companies that have already shown a little bit more success.

And, so, the recommendation that we've outlined specifically would provide an additional incentive, similar to what already exists for Angel

investments in opportunity zones, but for those companies that have somewhere between 1 and 50 employees to help kind of add that additional incentive to smaller companies that could use it.

ASSEMBLYMAN TULLY: Wonderful, thank you.

Kim, actually, I just noticed -- only because he said there's two new ecosystems that are developing; I'm just more curious about that.

MS. CASE: Yes, we're actually going to launch an RFP to inquire about who wants to apply to be an ecosystem. So, we don't know exactly their locations, but there's some space in northern New Jersey, still, to have ecosystems, and then, also, the infamous Central Jersey that was brought up before.

So, I'm going to send the RFP to you, and if you want to distribute, and people can send it out in their district, and there's going to be funding for ecosystems as well. So, it'll be a good situation.

ASSEMBLYMAN TULLY: We appreciate that. The Committee had a wonderful visit up in Bergen Community College--

MS. CASE: Yes.

ASSEMBLYMAN TULLY: --to learn more about the cybersecurity ecosystem and incubator there.

And, of course, Haskell, thank you again for having me at Innovation New Jersey.

MR. BERMAN: My pleasure, anytime.

ASSEMBLYMAN TULLY: This is the first of many conversations, and I'm sure we're going to have some good legislation come out of all your recommendations here, including the Innovation New Jersey reports.

So, I'll open it up to my colleagues on the Committee, if they have any questions or comments. (no response)

All right, very good. Thank you all, appreciate it.

MS. CASE: Thank you.

MR. BERMAN: Thank you.

MR. SULLENDER: Thank you.

ASSEMBLYMAN TULLY: OK, we're going to run right through here to Thomas MacLellan with Palo Alto Networks, Director of Government Affairs; Jermaine Bethune, with Palo Alto Networks, the Systems Engineer; and Barbara DeMarco with Porzio, the Vice President there.

B A R B A R A D e M A R C O: Palo Alto is in California. Why don't you go first, because I'm a local girl. (laughter)

T H O M A S M a c L E L L A N: Well, first off, thank you very much Chairman Tully and members of the Committee for having me here.

My name is Thomas MacLellan, and I head up Government Affairs for Palo Alto Networks. We are the world's leading cybersecurity provider. Jermaine Bethune is in the back; he is one of our local account team here for the State of New Jersey. He's our Systems Engineer. We also have Pat Rucker who also is our Account Manager here, somewhere right in the back as well. So, if you have any questions as follow up, please let me know.

I've got prepared statements that we've spent a lot of time in capital internally preparing. I'm not going to read them. I would rather you all take the time, and I hope to digest-- Really, my job here today is talking about the role of cybersecurity in helping to protect and to drive an innovation economy.

And, around that, too, let me just give you a little background on Palo Alto. We're the world's leading cybersecurity provider. We have a very simple mission: We want to be the partner of choice and protect our digital way of life. We've got about 14,000 folks around the world. We're in about 150 countries; we protect most of the Fortune 10, most of the Fortune 500; we protect BIG USG; we protect governments around the world. So, I was asked today to come in and talk about-- And, also, by the way, here in New Jersey we do have quite a footprint. We work closely with the NJCCIC. We work with many of the higher-ed. institutions that are here, and I'll talk a little bit about that.

Innovation is key to success for us here at Palo Alto. We are in one of the most competitive marketplaces -- cybersecurity, technology -- with some of the most well-funded adversaries -- China, Russia, Iran, Iraq, we can keep going on. If we do not innovate, we do not survive. Innovation is absolutely key to who we are as a company. It's part of what has allowed us to evolve from being a point product -- a firewall company -- to being the largest cybersecurity that provides a platform of cybersecurity services.

So, with that in mind, I just want to share with you all a couple thoughts and lessons. And, again, take the time to read the testimony. There's really kind of three areas I want to talk about, and I'll leave -- I'll get to yellow, and we can do, hopefully, some discussion.

One is, you need to promote a strong and diverse workforce. One of the biggest challenges that we see in IT, in cybersecurity in particular, is that there are just simply not enough qualified workers. And, I'll talk in just a moment about how we at Palo Alto are helping to drive that.

Two, you need to protect the intellectual property that is being generated through R1 university; through startups; through your own State governments.

Three, you as a State, you as organizations, you can support these startups in adopting innovative technologies. The mantra is this, and take this away: As you modernize, as you innovative, so do the bad guys. The bad guys have help desks; they've got technology that will blow you out of the water with things that they can do. Which means that we, on the good-guy side -- and I can count myself among the good guys -- we also need to innovate.

So, let's talk about, briefly, about promoting a strong, diverse workforce. There is a major shortage in the workforce -- in the IT workforce -- in cybersecurity in particular. Despite there now being 4.7 million professionals, there's still a 3.4 million workforce shortage in the whole world. In the U.S., it's about 700. I apologize, I couldn't find good data here for New Jersey, but I'm sure those numbers track. And, what I just heard from the last presenter here about the exodus of post-secondary grads leaving New Jersey, that is something I think, to drive an innovation economy, you need innovators, and innovators are the people that are coming out and hiring.

And, so, at Palo Alto-- First off, the NJCCIC, we work with them on the Jersey Capture the Flag, we also work with the NJOT and so forth on workforce-development issues. We also, at Palo Alto, we have our corporate values, which include kind of growing the next generation of cyber workers. And, we have an academy program where we provide curriculum to higher ed. institutions, including 11 institutions here in New Jersey. NJIT was just here; we also have Rutgers, Kean, Fairleigh, and so forth. But, you can look

at the list there. In addition to that, we also support 10 \$14,000 -- 14 \$10,000 scholarships to HBCU students. And, New Jersey should look for opportunities to continue to grow the IT workforce, I think with a particular focus on cyber, because there's such a growth opportunity there.

Number 2, protecting intellectual property. Doing something better, faster, cheaper, differently is the essence of innovation, and it's the lifeblood of startups. But, if you don't protect that IP, it's worthless. People get into this space to make money; to change; to make the world better, make the world different. And, particularly when you look at R1 universities here, we work closely -- you know, there are the three, NJIT, there's Princeton, there's Rutgers -- and, I failed.

ASSEMBLYMAN TULLY: You're good; keep going.

MR. MacLELLAN: So, protecting an environment conducive to exploration and innovation is very, very challenging. And, to do that in a secure way is particularly challenging.

And, so, it's going to mean changing the dynamics of how innovators and how security work together. They *have* to work together. We're no longer talking about the IT economy, we're just talking about the economy. IT and cybersecurity is not an extra; it is business essentials.

So, let's talk about adopting innovative practices. In your package, you'll find that we highlight six particular areas that the State can innovate right now; that organizations can innovate right now; that you can help communicate to your organizations right now. And, there is an opportunity right before the State. There's the State Local Cybersecurity Grant Program that's just come out from CISA, which provides dollars to the State to create net-new cybersecurity capabilities. These six are normed along

those lines; this is not a laundry list. This is not the wishlist. This is a very-
- This is what, when you build a house, a punch list. This is more of a punch
list.

And, I want to call out one in the purposes of time. It is called
Attack Surface Management. Attack Surface Management is just that -- you
need to know what the bad guys see about your networks. And, so, we've got
technologies -- innovative, we bought it from a startup, we've now built it
into the fabric of everything we do. We scan the internet, I don't know if it's
once every 15 minutes, or something like that, for organizations' weaknesses.
So, we can see what the bad guys see of your networks. And, in fact, that
concept was just picked up by the Department of Defense, one of our largest
procurements ever in our company, it's called Xpanse. So, we are now
protecting the attack surface for all of DOD. And, organizations here in New
Jersey that are looking to innovate need to know what the bad guys seek to
protect that IP.

So, with that, I will stop and, again, I would ask that you do take
the time to look over the prepared testimony. But, I'm happy to take any
questions.

ASSEMBLYMAN TULLY: Thank you, Thomas, for your time.

MR. MacLELLAN: I appreciate it.

ASSEMBLYMAN TULLY: The work was (indiscernible)

MS. DeMARCO: Hi, good afternoon, Barbara DeMarco of
Porzio Governmental Affairs on behalf of Continent 8 Technologies and the
greater Atlantic City Chamber of Commerce, on which I serve on the Board
of Directors.

What I'm going to talk to you today about is how internet gaming and sports wagering have created an ecosystem for tech in the Atlantic City areas specifically, and in the South Shore region.

This is a region of the state that does not have a diversified economy. I am fourth generation Atlantic County. There is farming; there is food processing, trucking related to that; there's limited travel and tourism. You have (indiscernible) and you have the hospitality and casino gaming. And that's what supports that economy. It is the reason why, in 2008-2009, Atlantic County had the highest foreclosure rate in the country. It's the reason why Atlantic City is the poorest location -- the city-- in the State of New Jersey. And, it's very important to highlight those things, because the only way you can build a community or build an economic model is if you infuse new industries and new talent into that community.

So, the first thing you guys did right was pass the Internet Gaming Bill in 2014. That bill opened up New Jersey to both internet wagering and, eventually, sports wagering. Now, it wasn't the first venture into gaming, using technology. The horse racing industry, for years, had done account deposit wagering, and later, exchange wagering on horses. So, we did have some background in this.

So, what happened next? After the bill is passed, they decided that most of the technology would be located in data rooms on casino premises. Now, our Constitution requires that all the servers be in the Atlantic City geographic area. Actually, this is such a bonus, and I'll give you a lot of reasons why. So, the first thing they did was they (indiscernible) to comply with the Constitution in Atlantic City, and then for regulations, since this is a highly regulated industry, it really would help the regulator if it's in

one place. The late Senator Jim Whalen did an amendment to the Internet Gaming Bill that expanded where the technology can be located, from data rooms on the different campuses of the casinos to one centralized location.

And, this is where my client, Continent 8 Technologies, came in. They are the leading (indiscernible) provider of technology infrastructure to the internet gaming and sports wagering industry in the world. They are wholly owned by one individual, Michael Tobin, who is an entrepreneur and just such a truly wonderful individual, who wanted to come to South Jersey, because he saw the similarities to where he's from in northern New York, and how southern New York got all the (indiscernible); northern New York didn't. Well, he saw the reverse in New Jersey, and he wanted to go in a location that needed help, needed diversification, etc.

So, this was the place where he built his only data center. The rest of his data centers for the other states that have sports wagering and or internet gaming are located in POPs -- Point of Presence -- and larger data centers. This is an independent data center built strictly for this purpose. It is a regulated data center. The only thing in that is the DGE and all the companies they regulate. It is located in a bunker, through a public-private partnership that I helped negotiate with the Casino Reinvestment Development Party, in the bottom of the Atlantic City Convention Center. And, I'm sure all of you went to the League of Municipalities and had no idea that a world-class data center was operational for 90% of internet gaming and sports wagering in the State of New Jersey in that bunker. And, I'm sure the bus parking lot where you see this great big metal structure -- you had no idea that's phase two, because there's been such a demand, to your issue on marketing.

There is no company that does a (indiscernible) in New Jersey. Why? We have the best regulators in the country, if not the world; they were the first to the table with innovation with internet gaming and sports wagering. And, people want to go in a stable, regulated environment. There's nothing worse than going into a state that doesn't know what they're doing.

So, that was one. Two, they loved the idea of a centralized location. Rather than being in Pennsylvania, where you have to go to a POP in Pittsburgh and a POP in Philly, you can -- it's all there. Both for the customer and for the regulator, so you can watch what's going on all the time.

So, all of these things have made it a very attractive place. Now, Continent 8, this is all they do. They've been in existence for over 20 years. They are located in the Isle of Man and their only other data center that does this is on Mohawk territory in Quebec. This is the only one they independently built is the one in New Jersey, in Atlantic City, in that bunker that you don't know is there, and we are now looking to go to phase three and four because of the demand. The people want Continent 8. Why? They know what they're doing. They know how to protect the information in there. They know how to work with the regulator. They are the chosen providers from around the world where internet gaming and sports wagering has occurred for years.

It hooks them, and this is the really neat part: If they regulated infrastructure or regulated clouds. For those of you who don't understand cloud: Google, Yahoo -- all it means is that you and I are on there and we don't know where our information is. It's in a server in West Virginia; it's in a server in a cornfield in Iowa. We don't know. When you have a regulated cloud: You know where your servers are; you can service your servers; you

know where your information is, and it's proprietary information. It's -- they know it's in that one place; they know it's protected by this proven company; they know it's being regulated by the DGE. That's a regulated cloud. Now, why do you want a regulated cloud? Let's use the analogy of I-95 and the Turnpike-- I'm sorry, I'm Italian, I use my hands. (laughter)

I-95, you drive on it. You don't know what cars are on that; you don't know who is in the car; you don't know what's in the trunk of the car; you don't know where the car is going; you don't know who gave you the money to put the gas in the car; you know nothing. On the Turnpike, you know where the car is, where they entered; you know if it breaks down, someone is going to come pick it up. So, you pay a premium to be on a regulated cloud. You pay a premium to be on a cloud that nothing else is on but internet gaming.

Why is that so interesting? That cloud is attached to the rock of Gibraltar, because their data center is where Eisenhower planned the North African campaign. Their data center is in the Philippines; their data center is in Paris; in Ireland; in the Isle of Man; and the list goes on. And, it connects as this private network around the world, so there's redundancy, there's disaster recovery, there's additional security.

Why is a data center and independent data centers so important to internet gaming? It can't go down. These servers are casinos; each one is licensed like a casino. Continent 8 is licensed like a casino. The reason why you don't see an Amazon or another one of these big server companies in there is because they don't want to vet every single member of their board or ownership through the DEG, because it's worse than the worst kind of physical exam you can possibly imagine. So, this little company that didn't

need all that research done upon it came in and they went through that, just like all the casinos do, and just like all the providers and licensees who work with casinos that are highly regulated.

Why? Because it was a dark industry, prior to us legalizing it. Ninety-eight percent of gaming was done illegally in the United States; it was legal elsewhere, but not here. So, you're trying to turn the tide on that, and make it legal. So, the-- Just like they did with brick-and-mortar casinos, they made it really tight, so no one can say New Jersey did it wrong and New Jersey allowed bad actors in.

So, the data center has redundancy, it has multiple sources of connectivity, it has generators, all brand new, that back up. If the power goes out -- there was a lightning strike to a transformer, everything went dark in Atlantic City. Anyone who had their stuff in the data rooms on the casino campuses went dark. The Continent 8 data center did not go down, not one minute. So, all their customers -- which are your FanDuels, your Draft Kings, your Bet MGMs -- they remain live and operational.

The other thing that's important to mention about internet gaming and sports--

ASSEMBLYMAN TULLY: Barbara, I want to get all your points out, but they have to apply to--

MS. DeMARCO: OK.

ASSEMBLYMAN TULLY: Thank you, I appreciate it.

MS. DeMARCO: The last part that I want to say is it kept both the horse racing industry and the casino industry alive and functioning during COVID. If it hadn't happened, you would have seen a total collapse of that economy, and a repeat of 2008.

So, when you do it right, you create the ecosystem, you create companies that come out of that that will provide you geofencing; that will provide you ID verification of people; that will do e-sports as a possible new form of gaming -- or live dealer, or live roulette. So much could come out of it. And, we're working with Stockton and (indiscernible) on the e-sports part of it. We are working with the CRDA on building on infrastructure. It's a good project, it's a wonderful way to do it, because we're in a very concentrated area, and we have the best regulators in the country.

So, I can give you all a positive story, and that's one.

ASSEMBLYMAN TULLY: Thank you, we appreciate that.

MS. DeMARCO: For South Jersey.

ASSEMBLYMAN TULLY: Thank you, we appreciate it.

Does anyone from the Committee have any questions? (no response)

All right, Barbara, thank you. And, I'm going to read your report and I want to follow up with you directly, so, I appreciate your time.

MR. MacLELLAN: Thank you, man.

ASSEMBLYMAN TULLY: OK, now we're going to bring up Ian McLaughlin with BioNJ, and is this Shane (indiscernible) with the Liberty Science Center.

UNIDENTIFIED SPEAKER: It's Christine--

ASSEMBLYMAN TULLY: Oh, Christine Schroeder, with the Liberty Science Center.

And, thank you so much for joining us here today.

C H R I S T I N E A R N O L D - S C H R O E D E R: Thank you so much, Chairman.

ASSEMBLYMAN TULLY: Thank you.

MS. ARNOLD-SCHROEDER: I am Chris Arnold-Schroeder, I am the VP of External Affairs with Liberty Science Center.

First, on behalf of LSC's trustees and my fellow executives at the center, I want to thank you for 29 years of support that the State of New Jersey has provided for LSC.

Next year, LSC celebrates our 30th anniversary, inspiring learners of all ages about the power of promise and pure fun of science and technology. LSC is proud to be the most visited cultural institution in the State of New Jersey, with annual attendance of more than 750,000 children and adults. The center houses the Jennifer Chalsty Planetarium, the largest planetarium in the western hemisphere. And, a new exhibition space, Weston Family Art and Science Pavilion. More than 280,000 K-12 students participate annually in STEM programs at LSC, 91,000 of which represent students from our high-needs, low-income communities.

LSC's mission is to inspire the next generation of scientists and engineers. During the COVID-19 pandemic, we became New Jersey's largest provider of live virtual science programming to sheltering-in-place students and teachers. Our astronomy webcasts alone for families drew over 200,000 views in 2020.

LSC has embarked on a large expansion project, what will become a 30-acre innovation campus called SciTech Scity -- and that's scity, S-C-I-T-Y; science infuses everything. The goal of this science city of tomorrow is to foster the creation and growth of new companies that use science and technology to make the world a better place. In the tradition of Walt Disney's original vision of EPCOT -- the experimental prototype

community of tomorrow -- SciTech Scity aims to be an internationally recognized community where businesses test and residents and visitors experience new science-based products and services before they come to market.

SciTech Scity will bring together technologists, scientists, entrepreneurs, civic leaders, citizens, teachers, students, and other thinkers and doers who share renowned computer scientist Alan Kay's prescription, that the best way to predict the future is to invent it. SciTech Scity will be a community infused with science, creativity, and actionable optimism about building a better future for all of us. SciTech Scity will help drive New Jersey's innovation economy and help position New Jersey, and Jersey City, as being on the leading edge of applied science worldwide. The business creation hub of SciTech Scity will be an eight-story facility called Edgeworks. It will have laboratories, our youth spaces, office suites, coworking spaces, and a product showcase for start-up companies and for established companies and universities that want to be a part of this innovation ecosystem.

We will initially focus on two industry sectors: Health care and clean tech/climate tech. You don't need me to tell you that there's a crisis in U.S. health care. Costs keep escalating; outcomes have worsened; and doctors and nurses are burning out. Technology can help us get out of this crisis by shifting health care from hospitals into peoples' homes. Technology will allow people to track their own health and intervene before they become severely ill.

SciTech Scity's first innovation partner and international tenant is Israel's Sheba Medical Center, the largest health-care system in the Middle East, and one of the top 10 hospitals in the world. An American affiliate of

Sheba will build and operate a cutting edge *hospital of the future* simulation space at SciTech Scity, employing a host of technologies (indiscernible) sensing, monitoring, AI, augmented reality, telecommunications, and robotics. This *hospital of the future* simulation will focus on digital health and some health care, home health care, including hospital and the home, which showed a promise of digital medicine to deliver better health outcomes and wellness equity. Digital advances in health care will help all of us, but they offer particular promise to underserved communities that don't currently have convenient or affordable access to specialized health care.

Sheba will not be treating patients at SciTech Scity, so, it will not be competing with existing hospitals and our own health-care providers in New Jersey. Medical providers, however, throughout the state, are invited to join Sheba and LSC in inventing patient-first futures of health care. Sheba Medical Center is SciTech Scity's partner in showcasing what health and medicine can look like in the near-term future. Top-shelf innovation partners in other key industries, energy/sustainability and artificial intelligence, for example, will ensure that SciTech Scity achieves its vision of being the premiere place in the world where people can come and see the future before it is actually here.

The SciTech Scity campus will house Liberty Science Center High School, a new public magnet STEM high school for Hudson County that will be built by the Hudson County Improvement Authority and operated by Hudson County Schools of Technology. The new high school will provide programs in Earth, sustainable engineering, and climate science, life, biological sciences, and space -- astrophysics -- to 400 students in grades 9-12. LSC will arrange for students to have intensive mentorships and work

experience with companies and scientists at Edgeworks, nearby Liberty State Park, and then LSC itself; and the companies in the surrounding community. One unique feature of this funding model for Liberty Science High School is that significant private funds, starting with the \$2.75 million matching grant from the Overdeck Family Foundation, went to fund this public school.

Liberty Science Center High School will put students on a path to well-paying STEM careers. This is particularly important in Hudson County, the most densely populated county in New Jersey, where students from low-income families are underrepresented, and STEM scholarship programs and Hispanic and Black adults are underrepresented in STEM jobs. LSC will create programs for middle school students from underserved communities in Hudson County who are passionate about science and aspire to attend Liberty Science High School, that may need extra help in mathematics and prerequisite skills.

SciTech Scity will also include Scholar's Village -- residential housing for innovators, teachers, scientists, entrepreneurs, STEM students, and other individuals who want to be part of this tech-progressive community that is inventing the future. These residents will have the opportunity to test and use transformative new high-tech products before the rest of the world.

SciTech Scity is a public-private partnership. The City of Jersey City gifted land to the project that is worth \$18 million. Additionally, Liberty Science Center has lined up approximately \$400 million for the project from individual philanthropists, like the honorable Frank J. Guarini. We've (indiscernible) companies like (indiscernible), Verizon, Bank of America, Horizon Blue Cross Blue Shield of New Jersey, and ADP. The extensive (indiscernible) on SciTech Scity is taking place right now. Construction is

expected to start early next summer, and once the final \$40 million needed for the project is in place, SciTech Scity is scheduled to open in 2025.

Thank you for giving me the opportunity to present SciTech Scity. I invite all of you to visit LSC. We have a great new exhibit on Pompeii, and, thanks to donors John and Regina Scully, one of the world's largest model train sets showing area Lackawanna as it was in New Jersey in 1952.

Please reach out to me, and we'd love to give you a behind-the-scenes tour.

ASSEMBLYMAN TULLY: Thank you, Christine, I appreciate it. Thank you for your testimony.

Ian, please go ahead.

I A N M c L A U G H L I N, Ph.D.: Chairman Tully, members of the Committee, and staff and aides, of course.

On behalf of about 400 companies and organizations in the life sciences throughout the State of New Jersey, from some of the largest entities in the world to a startup with two people and a test tube -- as our President and CEO Debbie Hart likes to say -- on behalf of them, thanks for inviting BioNJ to participate in this discussion.

I am Ian McLaughlin, the Executive Director of Government Affairs at BioNJ. And, I've shared written testimony which echoes and corroborates a lot of the points you've heard already today, so, I can just summarize and try to avoid too much redundancy for the sake of time.

So, New Jersey has earned the reputation of being the "medicine chest of the world," as my colleague from Innovation NJ mentioned. And, it's ultimately because it's home to one of the principle hubs of biomedical

innovation throughout the country -- and the world. And, that's because every single stage of the life cycle of transforming an idea into a therapeutic is represented in this state. And, that's a characteristic about which not many other parts of the country can boast.

And, so, in addition to New Jersey's density and its diversity and highly skilled and education communities, the state has a variety of innovative and unique mechanisms that offer support to startups in the life sciences. And, I'd just like to highlight a few, some of which you've heard earlier today.

So, in particular, we're grateful for Chairman Tully's participation in the Commission on Science, Innovation, and Technology, from whom you heard earlier today. Some of the mechanisms are opportunities like CSIT; Catalyst Seed R and D grants; R and D voucher programs; SBIR/STTR; direct financial assistance programs. These are all creative mechanisms, and they support the growth of new entities in the life sciences. And, then, also the Angel Investor Tax Credit and Evergreen Fund, which were mentioned earlier as well. And, we're excited to see the innovation that will emerge from the Hub, the Cove, and SciTech Scity -- the kind of clusters that provide the venues that have generated significant innovation in the life sciences nationwide, along with the NJ Pathways program that will help to connect people with the training that these companies need today for hiring, and hopefully, beginning to make some progress on that net migration of students to other states.

I've also had folks from other states and national organizations reach out to learn more about the EDA's NLL program. Their goal is to mimic that program for their member companies, and, you know, we're

grateful that these programs exist in New Jersey. And, we'd be thrilled to see them enjoy continued support, expanded support, many of which, again, have been highlighted in prior testimony.

Some examples of concerns that member companies have voiced over time. Specific examples -- I hope that the surtax imposed on corporation business tax filers will sunset, as it's scheduled to, at the end of next year. And, the only other concern that I'll highlight here are some of the provisions being considered that focus on -- being considered in the Legislature -- that focus on prescription medications in particular; a provision that would require advanced notification of prices prior to the launch of new medications.

I would also like to mention an initiative on which the life sciences industry in New Jersey is currently working, which is the health equity and clinical trials initiative, with the goal of improving demographic representation among clinical trials that are conducted in the state. You know, with the ultimate goal of ensuring that anyone from any community has the option and opportunity to participate in the latest of biomedical innovation that's occurring in New Jersey. And, you know, we would be thrilled with any possible collaboration that might be viable with State Government and State Legislature.

Apart from that, thanks again for including us in the discussion. And, we would be grateful for the opportunity for some of our member companies to continue this discussion, to engage with you all directly to convey some of the more specific points of friction that inhibit innovation in this ecosystem throughout the state -- from the large and established entities

but also some of the challenges that some of the smaller startups face, uniquely.

So, thanks again.

ASSEMBLYMAN TULLY: Ian, thank you, well done.

Christine, thank you.

Does anyone have any questions or comments? (no response)

Ok, thank you so much; appreciate it.

Next, I am actually going to bring up Fred Brody and Joe Montemarano. Actually, is Bill Connor here as well? Bill, I'll probably do you -- unless you want to come up as a group.

B I L L C O N N O R: I actually wasn't going to (indiscernible)

ASSEMBLYMAN TULLY: What's that?

MR. CONNOR: I wasn't going to testify.

ASSEMBLYMAN TULLY: Oh, you weren't going to testify, I just have you on my-- I will just check you off right here.

Thank you, Bill, appreciate it.

Fred, go ahead. Thank you.

F R E D M. B R O D Y: Yes, I would like to thank you, Chairman Tully, for this opportunity to appear before the Assembly Science, Innovation, and Technology Committee, and provide testimony to aid the development of a robust and inclusive innovation and start-up ecosystem.

I respectfully ask that the Committee accept my letter and the attached document prepared by Glenn Gladney, founder of Access Optical Networks, or AON. It's a minority-owned technology and manufacturing startup, with primary operations in New Jersey. Unfortunately, Glenn couldn't be here; he's undergoing some medical tests that couldn't be

rearranged around this Committee. AON has plans, as outlined in the attachment, to establish new facilities and employment within an opportunity zone in Newark, New Jersey. A brief description of the founder's expertise, as well as my own, is included in the attachment.

I am accompanied by Mr. Joseph Montemarano, who helped with these remarks, and he served on the original staff of the New Jersey Commission on Science and Technology for nearly a decade as Associate Director for Science and Technology. And, Director for New Technology Business Enterprise. A brief description of his expertise is included in the attachment as well.

I am here today as AON's consulting Director for Government Affairs. I have had an association with AON almost since its founding as a New Jersey technology startup around 2002. So, AON founder Glenn Gladney credits the Science and Technology Commission's university research infrastructure investments for the warm welcome he received at Princeton University, and for the ease of access to key faculty research collaborations that contributed to the core of AON's technologies. In fact, one of the most important legacies of the original New Jersey Commission on Science and Technology is its innovation, capacity-building, and influence on the culture of New Jersey research universities.

It's important to emphasize that there is no one-size-fits-all ecosystem for New Jersey's sectors. One beacon of progress in New Jersey's life science/biotech ecosystem -- which, a great deal of credit for groundbreaking startup-friendly New Jersey legislation is owed to BioNJ. For example, the startup net operating loss, or NOL, credits.

However, some of New Jersey's other technology ecosystems, especially for infrastructure, intensive hardware, and manufacturing, are less than optimal. We are glad to know that your Committee understands the importance of developing a strategic innovation and investment roadmap tailored to each of New Jersey's respective start-up ecosystems. It may also be useful to consider emulating successful economic development incentives offered by other states. For example, our closest neighbor, the State of Pennsylvania, has used its Ben Franklin Fund for decades to successfully entice promising New Jersey startups to leave our state.

Looking forward, the New Jersey Commission on Science, Innovation, and Technology should be a key player in assisting the Committee in development of this roadmap, along with New Jersey relevant public- and private-sector partners and organizations. The New Jersey Commission on Science, Innovation, and Technology's resources need to be augmented and adequately staffed for this undertaking and for implementing its mission.

Before closing, I invite the Committee to consider the needs and experience of AON as a technology and manufacturing startup, as well as many other New Jersey startups that have found conventional venture capital funding to be a mismatch. Also, some of the NJ EDA financial assistance programs should better align to meet the innovation ecosystem's needs. As an example, despite the significant technical and equipment investment AON has made over the past 20 years in New Jersey, and the several millions of dollars raised from friends and family stock investment, AON has spent endless hours on EDA -- NJ EDA -- applications and paperwork without receiving funding from this entity.

I thank you for your time and attention. Mr. Montemarano, who is our subject-matter expert here, and I would be happy to respond to the Committee's questions today or in the future.

Thank you, Chairman.

ASSEMBLYMAN TULLY: Thank you, Fred, I appreciate it.

Joe, please, go ahead.

J O S E P H M O N T E M A R A N O: Sure.

Thank you, Chairman, and thank you, Committee.

I just want to paraphrase Kim Case: If you don't know where you started, it's harder to know where you're going.

And, so, I'm appearing, in part, as being with the original Commission on Science and Technology. I understand that all of its records were, according to state retention policies, were sent to (indiscernible) and shredded. (laughter)

So -- but I also understand you did have interest in having some sort of a roadmap. And, what I brought, in near pristine condition -- and there should be a copy, at least in Governor Kean's archive -- of what was the original blue-ribbon commission document that, essentially, laid out a strategic plan and vision for how technology development and investment might occur.

I can comment that one of the four pillars that we never had enough funding to do was workforce development, so I certainly hope that that is something that attention is paid to. It's sorely needed.

The other, I would say, is I actually was the individual who identified this location on a trip back from Rutgers-Piscataway to my offices in Trenton. There was a sign out for lab space, and, as part of my

responsibilities and trying to be an advocate for New Jersey's entrepreneurs, I was desperately looking for wet lab space; and, when I came, there were 85 500-square-foot wet labs for the 22 subsidiaries of Johnson & Johnson. And, I went, at that point, racing back not only to the Commission, but to go talk to my friends at New Jersey EDA.

And, when they found out that it not only included the particular space -- and there were leaking ceilings, etc. at the time -- but, the land across the road, they got very excited about it. In fact, together, we figured out a way to help the Commission provide some seed funding for this first incubator, which was built here.

Additionally, you know, the experience that I've had with advocating for the small companies, that there are still areas where EDA's programs have not evolved to meet the needs of these companies. And, in particular, as what was referenced, not every company is based upon conventional venture capital. And, while with your messaging -- I'm sorry, it's very old school -- this is back in 2018. *US 1*, by the way, had over 10,000 readers in corporations up and down Route 1. And, specifically, this is talking about universal display.

And, they actually came out of technology invented at Princeton University, and I was very much part of helping in that commercialization, as I was the first industrial liaison for the Commission-sponsored Advanced Technology Center at Princeton. And, I concluded 25 years of service to Princeton as Director for Innovation and External Alliances. I've worked with hundreds if not thousands of the smartest science minds across the country and the world and New Jersey, and also worked very, very closely with partnering universities. So, while there are times when the universities find

it hard to play well together, under the Commission's influence, we saw a great deal of willingness for the universities to work together, and I hope that that is something which the new Commission can do as well.

And, so, I only would leave open is as somebody who has a memory of what's done and not asking to repeat what's done in the past, but at least as -- if there's any interest in areas where we might see how we can do things better, what worked in the past, we should continue amplifying. And, where we didn't really live up to what needs to be done is something we should also be paying attention to. Because, I'm sure we wouldn't be having this meeting today if your Committee felt that we were doing everything possible.

So, basically, I'm just happy to be a resource if needed.

ASSEMBLYMAN TULLY: Joe, I certainly appreciate you being here and bringing your knowledge here. And, I certainly want to (indiscernible) that as well.

Does anyone in the Committee have any questions? (no response)

All right, very good. Joe, thank you so much for making the time.

MR. MONTEMARANO: Thank you.

ASSEMBLYMAN TULLY: OK, we're almost there. We're going to have Michael Zwick with Rutgers, and David -- sorry, Row-Sue? Row-So, with Independent Colleges.

Come on up.

DAVID ROUSSEAU: Hi, how are you?

ASSEMBLYMAN TULLY: Thank you, gentleman, thank you for making the time today. I appreciate your patience.

MR. ROUSSEAU: I will defer to Rutgers first. (laughter)

MICHAEL E. ZWICK, Ph.D.: All right, grateful.

Good afternoon. I want to thank Chairman Tully for inviting me to testify for the Assembly Science, Innovation, and Technology Committee concerning innovation and start-up ecosystems in New Jersey.

My name is Mike Zwick, and I have served as the Senior Vice President for Research at Rutgers since September 2021.

As you may be aware, Rutgers, the State University of New Jersey, is a large institution composed of three geographic campuses: Rutgers Camden, Rutgers Newark, Rutgers New Brunswick, and Rutgers Biomedical and Health Sciences. We impact every county in the State of New Jersey. When I speak about Rutgers, I like to share our values, as communicated eloquently by our President, Jonathan Holloway. We seek to build a beloved community that embraces our diversity and is inclusive of everything we undertake; we relentlessly pursue academic excellence in our education and research activities; and we seek to bring strategic clarity to a large and diverse institution.

This is not only to benefit our students and faculty; we also strive to make Rutgers more easily accessed and understood by the people of New Jersey who, as a land-grant institution, we are duty-bound to serve.

Rutgers Research Enterprise, which is foundational to New Jersey and New Jersey's innovation and start-up ecosystem, is strong and growing. Last year, 1,595 different Rutgers principal investigators received 4,176 sponsored awards. In total, Rutgers received \$872.8 million in sponsor funding. Of note, our funding for biomedical research from the National Institutes of Health was \$241.4 million in fiscal year '22, and has grown by

25% over the last two years, and 56% over the previous four or five years. These Federal dollars support research employment on our campuses, state workforce development, and support for New Jersey businesses.

The Office for Research's innovation ventures team moves Rutgers innovations from discovery to the market. They manage approximately 1,300 technologies, 2,900 patents, have supported 96 active start-up companies, and oversee 852 licenses to external companies. Our diverse products include diagnostic tests for COVID; therapeutic development for human diseases; graphing technology; underwater drones; cement technology; recycled railroad ties; and agricultural products like cranberries and turf grass -- which, I think many of us probably ate a lot of cranberries recently.

Each of these research activities strengthens Rutgers' student-facing academic programs and helps prepare our students for the careers of tomorrow. A strong state university with growing external funding can pursue high-risk research that leads to discoveries essential for a vibrant innovation and start-up ecosystem.

Now, my career path, before joining Rutgers University, was a bit unusual. I arrived from Emory University in Atlanta, Georgia, where I was a tenured professor of Human Genetics and held several senior administrative titles. This is not unusual for an academic; what is unusual is that I am a former Surface Warfare-qualified Officer in the United States Navy; retired as a Commander O-5 in June 2017 with 25 years of service. I served onboard the USS Kauffman FFG-59 in Newport, Rhode Island, and I am a veteran of Desert Storm, was recalled to active duty to support the Iraq and Afghanistan war efforts from November 2002 through November 2004.

These collective experiences inform my leadership of the Rutgers Office for Research. First, I really seek to understand who we serve. At Rutgers, we serve our students, our outstanding faculty, our patients through Rutgers Healthcare, our 500,000 alums, and, ultimately, the people of New Jersey. Rutgers, the State University of New Jersey, is more than a name -- it's a mission.

Second, I seek strategic clarity in our activities supporting innovation and how we communicate. Frankly, as much as I did as a scientist -- I pursue experimentation -- we can only improve as an organization if we perform carefully designed experiments; take calculated chances; and measure our outcomes.

Applying these ideas to develop an exciting innovation and start-up ecosystem in New Jersey suggests strategies we might pursue. We want a system where entrepreneurs are empowered to take risks. Because entrepreneurship is risky, we should seek creative opportunities to help more succeed. Connecting, mentoring, supporting entrepreneurial individuals with diverse backgrounds is a key to a stronger New Jersey. This is something we at Rutgers have done and do effectively and efficiently. For example, Andrew Brooks who led the RUCDR Infinite Biologics, a part of the Rutgers Human Genetics Institute of New Jersey, developed the first FDA-approved saliva test for SARS COV-2 coronavirus. RUCDR Infinite Biologics was subsequently spun out as a private company in New Jersey now being sampled -- and it actually has laboratories located in Piscataway, New Jersey.

While the government should never get in the business of picking entrepreneurial winners and losers, it can support institutions like Rutgers University that act as thoughtful incubators of talented and promising

innovators. When faced with a complex challenge such as supporting an exciting innovation and start-up ecosystem in New Jersey, I seek to identify force multipliers. So, what are force multipliers? Force multipliers are attributes of an organization that enabled the successful completion of multiple essential missions. I first became aware of this idea during my service in the Navy, and I wanted to share a short anecdote that exemplifies this concept.

So, during Desert Storm, I was a communications officer onboard the USS Kauffman. We received this new technology called GPS, which at the time was encrypted, but allowed us to know our location on Earth with tremendous accuracy. At the time, this capability allowed the Navy to carry out many missions effectively. In my case, it allowed us to escort ships through minefields out of Kuwait City. Today, GPS is in our phones and our watches, and has become foundational for how we travel and live our lives. The potential for GPS as a force multiplier was clear then, and it continues to be a force multiplier.

So, what are some possible force multipliers at Rutgers that can further help develop New Jersey's innovation start-up ecosystem? I want to suggest two major ongoing activities that could be expanded and help catalyze future public-private partnerships.

The first is Rutgers core services. Core services are specialized research platforms operating a fee-for-service businesses, usually capital intensive, that support cutting-edge research essential for innovation start-up ecosystems. Many investigators need access to these platforms, but not a single investigator can fully utilize them. They also provide critical training

for our students; support our academic mission; and provide employment for technical experts who manage and run vital equipment.

Since I've arrived at Rutgers, we have sought to make these core services broadly available to New Jersey entrepreneurs. Further supporting this initiative, the Commission on Science, Innovation, and Technology began offering companies \$25,000 grants to use core services found at Rutgers and other public universities in New Jersey. The initial demand has been high, and increasing funding for this program can provide much-needed support for the innovation and start-up ecosystem.

Providing access to cutting-edge platforms can be the difference between success and failure for a start-up company. Given these initial successes, the State of New Jersey through CSIT, for example, could provide further support to institutions applying for Federal equipment grants to the platforms located within core-service facilities. For example, providing 10% of the cost of a platform for five years could be expected to help our faculty investigators obtain the other 90% of the funding from the Federal government for equipment purchase, with a remaining subsidy provided by the institution for managing the core-service facility. This is an innovative force multiplier, and not something other states are doing, but it could support innovation startups in New Jersey.

Supporting early-stage startups and reducing the failure of these endeavors can be aided by obtaining Federal SBIR/STTR grant funding. And, existing programs within the NJEDA and CSIT also support these goals and are worthy of continued support, but many fledgling companies need help to be competitive for such funding. At Rutgers, our tech-advance and health-advance programs are designed to provide funding for faculty startups to

generate critical data necessary for a successful launch. Increasing these fundings for these activities in New Jersey could be a game changer. These programs could be managed statewide by the NJEDA or CSIT, and would help strengthen the linkages between public universities and our New Jersey innovators and entrepreneurs.

New Jersey is poised to become an innovation leader. We have a diverse population with a vast pool of college graduates and top-level talent; a top-20 research university with a medical school; a soon-to-be built innovation hub in New Brunswick; and a robust life sciences ecosystem with many of the leading pharmaceutical companies in the world calling New Jersey home. The future of innovation suggested growing inclusive and dynamic partnerships between innovators, entrepreneurs, industry, investors, universities, and the public sector. New Jersey should lead the way in creating and nurturing the environment that will encourage such public-private partnerships. In proving our core services and enhancing financial mentoring support for startups are concrete actions we can take today to help us realize this vision.

As an educator, a public servant, a scientist, and citizen of the great State of New Jersey, I am deeply encouraged by this Committee's leadership. I know that working together, we can help make New Jersey a national and even global leader in innovation, new business creation, and economic development.

Thank you.

ASSEMBLYMAN TULLY: Michael, thank you for your service, and for your testimony. We appreciate it.

David, please go ahead.

MR. ROUSSEAU: Chairman Tully, members of the Assembly Science, Innovation, and Technology Committee, thank you for inviting me to testify at this hearing today.

I am David Rousseau, Vice President of the Independent Colleges and Universities of New Jersey, which represents the 14 nonprofit public commission institutions in the state. We have a map of the state with our locations in the folder I gave you. Our institutions include three research institutions -- Princeton, Stevens, and Seton Hall -- as well as 11 other comprehensive universities that offer a wide range of both undergraduate and graduate programs. These institutions are important contributors to the higher education ecosystem in the state, which has helped New Jersey maintain a Number 1 overall ranking in education -- K-12 and higher ed. combined -- and, included in your packet is a magnet highlighting the fact that New Jersey is the education state -- we talk about marketing and those types of things. So, something that we're trying to do for our own organization.

So, quick facts about our members and how they contribute to the innovation economy. Twenty-five percent of our undergrad -- we generate 25% of the undergraduate and 49% of the graduate degrees in math; 48% of the graduate degrees in computer science, 26% of the undergraduate degrees; and 51% of the graduate degrees in engineering, 28% of the undergraduate; and 63% of the graduate degrees in chemistry and 26% of the undergraduate; and 64% of the graduate degrees in (indiscernible) science. These levels exceed our general proportion of degrees in New Jersey; we're only 23% of the undergraduate degrees, and we're 36% of the graduate

degrees. So, you see those numbers show that our contribution to these sectors is strong.

On the specific topic of innovation and start-up ecosystem in New Jersey, as well as entrepreneurship, which feeds into these other areas. I provided you with this information from a number of our members of programs that they have on their campus. I'm not going to go through them all that I gave you, and I don't like picking one child out of the other. You heard a lot about Princeton today. Princeton is the big boy in things, but the one I would point you to is -- to potentially look at -- look at FDU and the Rothman Institutes. They're entrepreneur zones where they're going out and working in towns. I think there's 15 towns that they've already worked with these towns and a couple more that they're-- And, yes, Assemblywoman Murphy, there are some in South Jersey (indiscernible).

ASSEMBLYWOMAN MURPHY: I know there would be.

MR. ROUSSEAU: But, of course, the level of involvement varies among institutions. But, we all know that the next big thing could be developed by a graduate at any institution in this state or the country. Either the smallest institution in the state, or the largest institution.

One thing I would like to take away is that even if an institution is not heavily involved in tech or other STEM areas, it's important that we ensure the overall higher education system remains strong. While STEM may be sexy to talk about, our economy still needs teachers to educate the next generation and maintain our Number 1 ranking to help attract and keep these startups in the state. Since we all know that executives want good schools for their own children and their employees' children. We need trained nurses and health-care administrators to keep our state healthy.

These companies need -- these companies that will be startup -- need accountants; they need HR people; they need all the other things that make a business run. We all hear stories about, you know, startups coming up, that's a partnership of some guy who was in the engineering school and he gets involved with somebody in the business school to take it to the next step. So, we need to make sure that we can't lose focus on the need for all these other areas within higher education.

We've heard this discussion before -- we also need to make sure we have a strong higher education system in New Jersey, including my 14 members, to -- at worst -- not let the bad brain drain get any worse, and maybe even turn it around a little bit. An aside on that, the numbers are-- People have heard me, and this goes away from my interest -- my current employer's interest, and goes back to a prior life I had. This trend is a 50-year trend. We're not going to turn the trend around. What we have to do is just make sure it stays where it is and maybe, maybe we need to do in New Jersey, do a better job of attracting kids into our state to go to our schools. And, to that also, reduces (indiscernible).

My 14 members provide more choices to stay in New Jersey. Please take a look at the information I provided you with, and if you think, if you want to have further hearings and calling the schools directly, and there's a couple other asides, stepping aside from my current role.

Some of you know I had a long career in State Government. Some of you are younger than, probably, my career in State Government was. I came into State Government in 1982. I had a 23-year career at the highest levels of the Executive and Legislative branch. I had the privilege and honor of being sentenced to be State Treasurer during the recession of 2008 and

2009. So, 14 years ago at this time, I'm pulling my hair out every day -- I had more then -- every day, trying to figure out what -- how to deal with what we were dealing with. And, I've seen the good, the bad, and the ugly of New Jersey policy. I've seen the demise of us as a pharmaceutical industry. The manufacturing side of it moved out. I probably dealt with legislation that helped Rahway do what they wanted to do with the Merck property. I know I worked on what Clifton and Nutley needed to do with the Hoffman-La Roche, the change in the telecommunications; the rise of sports betting; and those types of things.

You know what? We always move -- we always move forward. And, it was talked about, "How do we promote these things?" One-- And, this is clearly a personal opinion. One of the things that we do in New Jersey, and it's both our politics, it's outside groups-- We do a really good job of tearing ourselves down. And, so, that means that the marketing we have to do, we have to do marketing just to get us back to where we were to neutral. And, so, that's always a challenge.

And, I would tell you that, if you ever get a chance, and it really talks about that New Jersey mentality, about how we tear ourselves down but we try to build stronger from it. I had the honor of, I was sitting on the -- as Treasurer -- I was on the Sports Authority. I was on many authorities. I was on the Science and Technology; EDA. I was on the Sports Authority the first year that the New Jersey Hall -- first class New Jersey Hall of Fame. I think it was 2009 or '08, when Bruce Springsteen was one of the inductees. And, if you Google it, you go back and you read his speech that night, it talked about that mentality in New Jersey. I'm not sure if it's good or it's bad, but it's something we have to deal with.

And, maybe it's the whole, you know, New York-New Jersey -- New York-Pennsylvania thing. But, we need to do a better job, all of us -- Legislature, outside groups, not tearing us down all the time. And, if we say we're bad, it's a self-fulfilling prophecy. And, I'm not sure how we change that, but we have to figure out some way to change it. That's a personal editorial.

ASSEMBLYMAN TULLY: I appreciate that.

David, Bill, thank you so much.

Does the Committee have any questions? (no response)

Wonderful. I would love to follow up with you directly, but I appreciate you guys being here today.

Thank you.

OK, Anthony Lowman from Rowan, and Luis De Abreu from Bergen County Community College.

Gentleman, thank you for being here.

ANTHONY LOWMAN, Ph.D.: Thank you very much.

Good afternoon. My name is Tony Lowman, I am the Provost and Senior Vice President for Academic Affairs at Rowan University.

I want to thank the Committee for having us today, and allowing us to tell our story, to talk about our work in the area of technology, innovation, and workforce development. I am here on behalf of our President, Ali Houshmand, who sends his regards.

So, I want to start: I've been at Rowan 10 years. I joined Rowan University when Ali Houshmand took over as President, along the same time Rowan received its designation as a State research university. In that time, we've grown from 10,000 students to, now, over 23,000 students. That's our

commitment to stopping the drain -- brain drain -- out of New Jersey. So, we've been working very hard to bring these students to New Jersey and really help transform New Jersey into a leader and destination for research innovation.

On this time we've been focused on the President's strategic compass, which aligns four pillars. These pillars are: Access, affordability, quality, and, really, being the economic engine for our region. With your belief, your investment, and, really, trust in us, we've grown dramatically. Ten years ago, we were a regionally ranked Masters-classified university. Today, we're a top-100 public research university and we're the third-fastest growing university -- research university -- in the country. We're currently a Carnegie II classified university. You might have heard our colleagues from NJIT and Rutgers speak to Research I status. And, we have a rapid, aggressive pathway to becoming Research I university, which would give the state three public research universities performing at the elite levels of research universities in the country, which would help us become that national leader in research innovation.

We're one of four schools in the country to offer two medical schools with an MD and a DL program. And, in about 18 months, when we open the doors of our School of Veterinary Medicine, we'll be one of only two institutions in the country with two medical schools and a vet school.

Recently, we partnered with Virtua Health to create the Virtua Health College of Medicine and Life Sciences of Rowan University, along with a new school, the Rowan Virtua School of Translational Biomedical Engineering and Sciences, to provide pathways to collaborations that we are eager to explore. Our two institutions are combined investing nearly \$200

million for innovation and life sciences, to drive innovation from the bench to the bedside.

As a leader in education innovation, particularly at the intersections of life sciences and engineering, Rowan is dedicated to expanding our entrepreneurial spirit in the area of research and technology commercialization. On our 700-acre west campus, we've built the South Jersey technology park of Rowan University. We're sitting here today in this innovation hub that's an incubator in life sciences. That's our tech part down in South Jersey; we have three major research centers doing work for the Department of Defense. It's our center for research in education; advanced transportation engineering systems; our center for advanced materials and manufacturing; and our virtual reality, augmented reality and artificial intelligence center on the west campus. We also have more than 20 startups focused mainly in the life sciences. These are companies that have spun in from the outside to partner with the university, as well as spin-outs from Rowan University research.

The tech park offers a space for entrepreneurs in the industry to collaborate with the university on research and development; launch new products; and start new businesses. Myself, I'm actually -- aside from my day job of Provost -- I'm also an engineer and entrepreneur, and I have a company housed at that tech park looking at new medical devices.

In the tech park, we also provide a commercialization office; access to faculty and students; a pipeline of talented expertise for these young technology-based companies. We have additional resources available through our nationally recognized and nationally ranked School of Innovation and Entrepreneurship within Rohrer College of Business. In an

entity designed to further opportunities, professional startups, and a cross-campus entrepreneurial mindset.

Additionally, in the City of Camden, with our medical school in partnership with Cooper Health, we work out of the Joint Health Science Center in Camden, working in areas such as cancer research; medical robotics, using virtual reality and augmented reality and AI; as well as research and health equity and social determinants of health.

One of the things I heard a lot today, I've been hearing a number of folks from the EDA, my colleagues in other universities; I've heard from industry: the challenge of access of venture capital and seed capital for companies. And, at Rowan, we watched startups come out of our college. We watched talented students leaving with innovative ideas, going into Pennsylvania, Delaware, Maryland, because they saw the funding. So, we started the Rowan Innovation Venture Fund in 2014, a university-based innovation fund targeting our students, alumni, and companies working in the area that were willing to stay in South Jersey to drive innovation. This fund was a pretty good success for the university, so just recently we announced the increasing of this fund up to \$25 million in investments for early-stage companies who want to make South Jersey and New Jersey their home.

So, we talk about Rowan, and, in 10 years -- I'd like to highlight that -- we've transformed from a respected regionally master-class fund institution into a research powerhouse. And, we're continuing to invest in the university of the future with things like our Rowan Innovation Fund, as we talked about, but we're also continuing to develop our west campus. We're currently in the design phase of a 200,000-square-foot R and D and

manufacturing hub, to be a home for industry and academics to work side by side for workforce development, as well as develop new technologies. We're also in the final phase of design, and we're about to begin construction on a \$50 million life sciences research tower to support the Virtua Health College of Medicine and Life Sciences. And, we believe this will be the location to bring technologies to bench-to-bedside.

I see red, so I'm just going to move on through, because you can read a lot of this.

ASSEMBLYMAN TULLY: I appreciate it.

DR. LOWMAN: So, I'll just get to the summary at the end. So, I was-- Unfortunately, Assemblywoman Murphy had to leave, but she made the comment about all the great things that the EDA was doing and how, boy, wouldn't it be great to see some of these things in South Jersey with the state investing? Well, we're doing it at Rowan.

You might have heard what I talked about. We're aligned with all these things; we're doing it with our commitment to keeping our cost down for students. And, we're also doing it, really, looking at relatively meager levels of state funding compared to some of our peers. And, I'm not here to complain, I'm not here to say that we're not going to do it. We love what we do, and we love being a part of the State ecosystem. I think we can think about Rowan, think about -- we can add value to the State's initiative. We can be a great partner, we can be a great State asset. And, as we bring access to talent and funding and land and a pipeline of a workforce, think of Rowan as a great State asset as we move forward.

Thank you.

ASSEMBLYMAN TULLY: Anthony, thank you, I appreciate your testimony.

I would love to follow up with you after, because I've watched from afar, the growth of Rowan has been very impressive.

So, thank you for your testimony.

Luis from Bergen Community College, thank you so much for coming here, I appreciate it.

L U I S D e A B R E U: No problem; thank you very much for the invitation.

Members of the Committee, my name is Luis De Abreu, I am the Director of the STEM program at Bergen Community College, located in Paramus, New Jersey.

And, our President, Eric Friedman, sends his regards, as well as members of the Board of Trustees that have been very supportive. In fact, I was able to bring one of them with me, Trustee Barreto, who is here in the audience with me.

I've been at the college for about 11 years, always involved with anything that is STEM related. I've been the Director of the STEM program for about six years already.

And, just a little bit about Bergen Community College. We have a little over 11,000 students, which about 25% of them are STEM students. We are predominantly a minority institution; about 41% of the students right now at Bergen Community College are of Hispanic descent, which speaks volumes of the diversity in Bergen County and the State of New Jersey as well. Talking about that, a talented pool of students at Bergen Community College is heavily involved in research, which is not common for a community

college. In fact, we have an award-winning research center, a STEM students research center. We are the only community college in the country that has a multi-disciplinary STEM research center of its kind, which has made us -- put us on the radar. In fact, we have won a couple of awards, and we keep going in that direction as well.

Talking as well about the success of the students and the research, back in June, we were selected as one of the finalists to come down to Virginia and compete against 12 other finalists from other community colleges around the country in the Community College Innovation Challenge. Of course, the students of Bergen Community College did such a great job, they walked away with the first prize as the leading innovation in the competition. And, many Angel Funds approached us, which was very, you know -- it validated all the work we've been doing with the students. Again, it's something currently new for a community college to be exposed in that realm, but we have taken it to the legal level. We, now, we're working on establishing patterns; we're working with a legal department at the school just to be able to, somehow, capitalize on this success that the students have had on this research innovation project, and we're looking forward to taking it to the next level.

The research done with the students has also been recognized by many other organizations. Students are getting awards up and down; they're being accepted to top institutions around the country. But, many of them have actually expressed the wish to stay here in New Jersey. In fact, too bad that Kim Case has left, but some of our students are part of their Governor's STEM Scholars Program that they have established at the R&D Council.

What else? We have, aside from the CCIC, the Community College Innovation Challenge, we also do our internal competition, and we invite all our corporate partners as well as educational partners, and other organizations that work with us. And, we look forward to do one more that we're going to be doing on April 14, so, consider this an invitation to all the members of the panel to come and join us to the STEM C² Research Summit, which is a way for us to bring together all high schools and two-year institutions as well as four-year institutions together to show the talent of the different students in the state, and, sometimes even across the river. We bring people from New York just to show us what's going on in the research realm.

We are the lead institution on one of the New Jersey Pathways, R and D Workforce of Innovation, which was originally established by the AACC, as well as the lead institution for one of the ecosystems that Kim Case mentioned from the R&D Council. So, you can see the commitment from Bergen Community College in terms of taking the students to the next level in terms of research. Again, it is something that is not common for community college, but we have proven that as long as it's done correctly, and as long as the students are being provided with the right tools and resources, they can really excel and take it to the next level.

You've met Eduardo Hernandez, which was one of our students back in March or so when you came to visit the school, he was talking about cybersecurity. And, just to give you an update on Eduardo Hernandez -- Eduardo Hernandez was awarded with one of the strongest, one of the biggest and most competitive scholarship awards in the country, which is called the Jack Kent Cooke Scholarship Foundation: \$55,000 to go to the school of his

choice; he decided to stay in New Jersey and is going now to Stevens to pursue a career in cybersecurity.

So, one of the main key takeaways that I want from this event is to hopefully create a portal or some way for us to all communicate. I feel that us, as a community college, I feel the pressure, actually, now, to be able to produce all the talent that is needed by many of the organizations that presented today. So, I'm looking forward for that connection, for that networking, in which I don't need to reinvent the wheel here; I don't need to come up with ideas; I don't want to be making arbitrary decisions. I want to talk to some other organizations that presented here today in order for us to make the best possible case, best practices, and bring New Jersey back on board at the top, leading state in terms of research and innovation in the country.

Thank you for your time.

ASSEMBLYMAN TULLY: That's wonderful, Luis.

Thank you so much for your testimony here today, and I can speak to the incredible work you're doing there. So, thank you, and, Joe, it's always great to see you -- a dear friend from Bergen as well.

So, thank you.

MR. De ABREU: I appreciate it, thank you.

ASSEMBLYMAN TULLY: Does anyone have any questions?

(no response)

OK, thank you so much, appreciate it.

MR. De ABREU: Thank you.

ASSEMBLYMAN TULLY: OK, up next we have multiple representatives from Montclair University. Gary Williams, Maria Rodriguez-

Gregg, Lora Billings, Elizabeth Rich, and Valeria Aloe. I don't know if we can all grab an extra chair.

OK, thank you so much, I appreciate your patience today. I believe you're actually our last group, so--

MARIA RODRIGUEZ - GREGG: Saved the best for last--

ASSEMBLYMAN TULLY: Exactly--

MS. RODRIGUEZ-GREGG: --right, on this gorgeous, gorgeous afternoon -- or shall I say evening, since it's already dark out.

Thank you so much, Chairman Tully, and members of the Assembly Science, Innovation and Technology Committee. We are very appreciative for the opportunity to talk about Montclair State University and what we are doing to innovate.

You know, a lot of people talk about other universities. We heard Rutgers, Rowan, Stevens, so many. But, we rarely hear Montclair. We're doing so much, not just to create transformational opportunities for our students in experiential learning, but to also give back to our communities and create an economic impact in almost every sector.

So, we are very excited to speak today. I am going to pass it on to, we have Dr. Billings, Dr. Lora Billings. She is the Dean of the College of Science and Mathematics, as well as Elizabeth Rich and Valeria Aloe, who are from the Feliciano School of Business -- specifically, the Center for Entrepreneurship and Innovation -- to talk about what they are specifically doing.

I am going to kick it off to Dr. Billings first.

ASSEMBLYMAN TULLY: Thank you.

L O R A B I L L I N G S, Ph.D.: So, thank you, Chairman Tully, and members of the Committee.

I want to very quickly say that the College of Science and Mathematics at Montclair is a research-driven solutions generator, intertwined with an educational mission. We are committed -- we are a Hispanic-serving institution. We are committed to building community collaborations and partnership to solve real-world problems and train a diverse *and* creative STEM workforce for New Jersey and beyond. We are committed to building an ecosystem that supports that clean energy and sustainability that will make the Governor's goal of 100% clean energy by 2050.

And, by investing in experiential learning through our internship program, such as the PSEG Institute for Sustainability Studies, their Green Teams projects in the summer and the academic programs, such as our Doctoral program in the Environmental Science and Management, we have created a thriving community of scholars to conduct cutting-edge research; educate new generations of scientists, scholars, and entrepreneurs; and fuel the region's economic growth.

We're an RII -- I would talk a little bit about the RII and RI, but NSF calls us the "missing millions." This is the group of people you really want to access to get us to that next level. And, additionally, we are taking advantage with these programs that we've heard so far today. Our Clean Energy and Sustainability Analytics Center has ongoing relationships with corporate partners, utility providers, and government agencies to identify and quantify and interpret the ramifications of clean energy developments to facilitate energy planning.

As Judith Sheft mentioned before, the CSIT clean tech research and development voucher program are a part of that. And, we have a company called iCheck Energy that's performing energy audits at the university to try and figure out how we can be more efficient. We also are part of the New Jersey Wind Fellowship Programs. So, yes, we can be in that group up north with wind, which recruits New Jersey students in offshore wind jobs and supports the next generation of research for the offshore wind industry.

But what about the future? We are building on our successful partnerships with the nearby City of Paterson. We're going to propose to develop a New Jersey Green Innovation Center to serve as the State's information resource for emerging energy and sustainability resources. Located near the Great Falls along the Passaic River, the setting provides an ideal spot for meetings, workforce training, K-12 education throughout the year, while bringing business and economic opportunities to this urban and historically undeserved part of New Jersey. The project would increase public access to environmental resources; foster public participation in green innovation; and promote environmental justice. It's a unique area dating back to Alexander Hamilton. They have multi-tiered raceways that actually fueled the industrial park for 154 years. We're thinking of this as sustainability past, present, and future.

We would invigorate local environmental education and training programs in the domains of clean energy; water and wastewater; green infrastructure; resource conservation; waste management; and the sustainability for Paterson and the nearby areas. It could be a hub that brings together innovators and climate tech; communicates economic opportunities;

and educates the public in the latest practices in clean energy adoption and sustainability practices. So, this center would guide the New Jersey green workforce of the future.

So, the possibilities for public service are endless, and we hope you support our ambitious project.

ASSEMBLYMAN TULLY: Thank you; appreciate it.

V A L E R I A A L O E: Hello, my name is Valeria Aloe, Co-Director of the Center for Entrepreneurship and Innovation.

So, founded in 2013 -- nine years ago -- the Feliciano Center for Entrepreneurship and Innovation at Montclair State University is a dynamic initiative with science to serve as a catalyst for innovation, economic inclusion, and access to current and future entrepreneurs. The Center serves as a bridge between start-up founders seeking help and those who have the experience, the knowledge, and financial means to provide critical assistance. We are a vibrant community of small businesses, leading-edge technology, experts, and community partners. Our mission is to support current and future entrepreneurs -- particularly micro businesses and solopreneurs.

We serve the underserved. Ninety percent of those who went through our programs are either female or people of color. And, the campus where we are, we are at 60% of our students are students of color/non-white. So, we support them as they launch their concepts and grow their businesses.

Our commitment to innovation in the start-up economy is evident not only in our mission, but in how we facilitate it. Our approach immerses our participants in an ecosystem of experimentation in which founders can assess their concepts through multiple pathways of product validation, research, customer feedback, prototyping, and refinement, before

proceeding to launch their business. So, we have them go through methodic, step-by-step approaches versus them jumping into investing in an idea that may not be ready for investing, or in a patent that may not be ready yet.

Mindset -- it starts with a mindset. Innovation for us is in the mindset. The goal is to equip students and community members with a new way of approaching problem solving, critical thinking, and the transformational mindset that will lead to long-term personal and professional success regardless of whether or not they choose to pursue entrepreneurship. When it's in the case of our students, what we do is we challenge them to think differently, to look at a problem from many angles, and to give them the skills that then can serve them as they progress in life, whether they become an entrepreneur or they decide to go for a corporate job.

ASSEMBLYMAN TULLY: I appreciate it, thank you.

MS. ALOE: Thank you.

E L I Z A B E T H R I C H: So, hi, thank you for having us here today.

My name is Liz Rich, and I am also a Co-Director at the Feliciano Center for Entrepreneurship and Innovation.

And, so, coming out of the pandemic, we knew that New Jersey entrepreneurs and small business owners were really struggling, obviously. That is obvious to all of us. So, we knew that our entrepreneurship center really had to serve our community, and needed to change all of the things that we were doing so that we could serve our entrepreneurs in this post-COVID moment. So, Valeria and I talked to hundreds of entrepreneurs and other stakeholders on and off campus in our community to understand their

needs, specifically in this moment, and three things really continued to surface as we talked to them.

One being folks just needed practical knowledge. I was talking to a lot of my students and they were going to TikTok and YouTube to get entrepreneur -- and, it was just heartbreaking for me. So, folks really just need practical knowledge on how to start and grow their business.

They also needed that sense of community and fellowship. I think a lot of us during the pandemic who weren't entrepreneurs, we can all attest to the fact that we were feeling isolated and that we needed that sense of fellowship. So, entrepreneurs especially is a very lonely, lonely road. So, they needed that sense of community especially.

And, then, last: funding. Entrepreneurs always need that start-up cash and seed funding for their businesses.

So, based on this, we created our Ignite Entrepreneurs Program in Spring 2022 -- not to be confused with the EDA's Ignite Program, I think I need to trademark ours. So, Ignite is a six-month program offered twice a year, and it blends the critical components of what our entrepreneurs need. So, it gives them on-demand virtual learning; you meet them where they are when they're ready to learn. We give them experiential, in-person workshops, individualized mentorship: It's not a one-size-fits-all solution; mentorship needs to be individualized. We also give them group networking opportunities and seed funding opportunities, because we know that, alone, all of these things are great, but if we really want to create impact and positive outcomes, we really have to have this continual blending of all these elements.

So, the program is currently serving predominantly female founders and entrepreneurs of color, who have not had access to the

resources, networks, and opportunities that they deserve. And, so, that is really important to us, that we are serving our community well.

And, through Ignite, we're giving them an ecosystem rooted in innovation and experimentation where it's OK to fail, it's OK to take risks; we just want them to explore something new and novel. Whether it's a new piece of their existing business, or something entirely new that we've never seen before. So, we don't want our entrepreneurs to only fall in love with their individual outcomes and their individual product or individual revenue, right? We want them to fall in love with the collective problems they are solving for their communities, for our state. It's really important that they fall in love with their problems, because we know that where this mindset takes place, new worlds can emerge and we can make really, really cool things happen.

So, this program is innovative because, as Valeria said, we spend a lot of time in that mindset expansion stage, and we have a tremendous benefit in that we can also have folks utilizing our 3-D lab. We have a 3-D printing lab, our mix lab, it's one of the largest 3-D printing facilities in the nation, which serves as an inter-disciplinary hub for transformative innovation. Our mix lab offers prototyping services to the region's small and mid-sized manufacturing companies, and helps creators develop real-world outcomes to the most pressing challenges.

So, you know, in conclusion, our success stories really illustrate our commitment to innovation and access to our communities, including a female founder who recently worked in our ecosystem and sold her company to Nutronix in 2021, an alum who I've worked with personally who prototyped several of his projects for years at our mix lab, and he's now just

gained national distribution in over 50 home design stores, including a national chain, Nordstrom.

So, we're so proud of our students, and we just want them to thrive. And, I think the common thing that has come out here is that we just need to come together, right? There are so many opportunities out there. How do we let our students know what's out there for them, and how they can continue to grow?

Do you want to add anything?

MS. RODRIGUEZ-GREGG: Yes, and I just want to add to that, I think, one, it's great that this Committee is kind of bringing the show on the road and coming to the Bioscience Center. We would gladly welcome you to come to Montclair. I mean, we're addressing a lot of the issues in New Jersey when it comes to teacher shortages, nursing shortages, even our merger that's happening with Bloomfield College to ensure that that PBI -- the state's only PBI -- is still an institution in New Jersey. And, we would love to host maybe a roundtable or something, where we can further discuss and have more people come together, some sort of summit, to really talk about this collectively. Because, it really is holistic, and we do need to come together as opposed to being in silos.

ASSEMBLYMAN TULLY: Totally agree, and thank you so much for your time today, I really appreciate it.

I would like to hear more about the center, so I'll certainly follow up with you directly.

Does anyone have any questions, comments? (no response)

OK, thank you so much.

MS. RICH: Thank you.

MS. ALOE: Thank you.

ASSEMBLYMAN TULLY: And, I believe that's it.

I know this was a long day, but I appreciate all the work, it's important.

And, thank you so much, we are adjourned.

Thank you.

(MEETING CONCLUDED)