

THE ECONOMIC IMPACT OF FEDERAL INVESTMENTS IN MASSACHUSETTS

FIELD HEARING

BEFORE THE

SUBCOMMITTEE ON
ECONOMIC POLICY

OF THE

COMMITTEE ON

BANKING, HOUSING, AND URBAN AFFAIRS

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ON

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MASSACHUSETTS

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THE ECONOMIC IMPACT OF FEDERAL INVESTMENTS IN MASSACHUSETTS

FRIDAY, OCTOBER 20, 2023

U.S. SENATE,
COMMITTEE ON BANKING, HOUSING, AND URBAN AFFAIRS,
SUBCOMMITTEE ON ECONOMIC POLICY,
Lowell, MA.

The Subcommittee met at 3:00 p.m., at the University of Massachusetts Lowell, University Crossing Building, Room 490, One University Avenue, Lowell, Massachusetts, 01852, Hon. Elizabeth Warren, Chair of the Subcommittee, presiding.

OPENING STATEMENT OF CHAIR ELIZABETH WARREN

Chair WARREN. This hearing will come to order.

Good afternoon and welcome to today's hearing "The Economic Impact of Federal Investments in Massachusetts".

This is a hearing of United States Senate Committee on Banking, Housing, and Urban Affairs Subcommittee on Economic Policy.

I chair this Subcommittee, which oversees issues of economic growth in this country. Given this Subcommittee's focus, it is no surprise that we are here today to talk about one of the key drivers of economic growth, public investment.

One of the most important things I do every day as a Senator, is make sure that the Federal Government officials are aware of the Commonwealth's needs and that our communities, our residents, and our small businesses get the Federal support that they need.

To get that done, I work with my partner, Senator Ed Markey, who tirelessly advocates for Massachusetts in the Senate, and with our hardworking House partners, including Congresswoman Lori Trahan, from right here in Lowell.

Now, in Washington, we have also worked with everyone, both Republicans and Democrats, to deliver for our Commonwealth. In just the last 2½ years, we have worked with President Biden on historic legislation to bring nearly \$8 billion in Federal funding for projects to expand our infrastructure, public safety, research, and transportation projects right here in Massachusetts.

With President Biden and the leadership of Democrats in Congress, our Nation has made truly historic investments.

The American Rescue Plan, the bipartisan infrastructure bill, the CHIPS and Science Act, the Inflation Reduction Act.

Four bills. Two passed with Republican support, and two passed entirely by Democrats. Four bills that have delivered money to

fund hundreds of projects and thousands of jobs right here in Massachusetts.

This work has made a difference that can be seen all around the State. We have supported firefighters, with over \$270 million in Federal funding. We secured \$185 million in Federal funding to help connect every home, school, and business in Massachusetts, with affordable broadband.

We have fought for funding to repair and replace aging infrastructure and bridges that pose safety risks to drivers, pedestrians, and businesses, including right here in Lowell, the Broadway Street, Market Street, and Lawrence Street and Swamp Locks pedestrian bridges, and roads and bridges all across the Commonwealth.

As we discussed earlier today, we have secured commitments for hundreds of millions of dollars to begin replacement of the Bourne and Sagamore Bridges on Cape Cod.

We have invested in public transit, including Federal funding for the Green Line extension, our ongoing work to make sure the T is safe and reliable, and \$275 million in Federal support for transit capital and operating expenses, funding for transit systems in Barnstable, Springfield, Worcester, and other cities and rural communities throughout the State.

We are supporting clean energy and a clean environment. We fought for and won \$1.5 billion in the Bipartisan Infrastructure Law for the EPA's Brownfields program. And now, 14 communities here in the Commonwealth, including Worcester, Berkshire, Springfield, Ware, and Westford, have received Federal grants to clean up polluted, abandoned, and neglected properties and redevelop them into meaningful community assets.

The Bipartisan Infrastructure Bill created the clean school bus program. Last year, five Massachusetts school districts, Fall River, Lawrence, Lower Pioneer Educational Collaborative, New Bedford, and Upper Cape Cod Regional Vocational Technical received nearly \$30 million through the program to buy dozens of clean, new electric school buses. And there is more money on the way.

We have fought for billions of dollars in new funding for research and innovation, including nearly doubling the funding for the National Science Foundation.

Together, the National Science Foundation and National Institutes of Health have supported thousands of jobs here in Massachusetts and thousands of scientists at all of our great research institutions, including nearly \$12 million in funding, right here at UMass Lowell.

Last year, we learned that the Department of Energy was providing two Massachusetts companies, 6K, Inc., and Ascend Elements, more than \$530 million dollars for innovative battery manufacturing, recycling, and materials processing.

All of this Federal support means that Massachusetts will continue to be a leader in research and innovation, building a cleaner future for our children and grandchildren, and creating thousands of good paying jobs here at home.

And there is more.

This year, with the Massachusetts congressional delegation, we secured legislative earmarks worth nearly \$225 million to support

160 community projects across Massachusetts. I just have to name a few.

Funding for Home Base and Massachusetts General Hospital, so that we can support the families of fallen veterans.

Funding for childcare services for homeless families in Boston.

Funding for the North Shore Workforce and Career Mobility Program in Salem.

Funding for Cape-Abilities, to support adults with significant disabilities.

And dozens more projects like these.

Governor Healey and her administration have been strong partners, helping to identify needs and doing everything they can to identify, plan, prepare for, and implement infrastructure and other projects that receive Federal funding. I am extraordinarily glad that she is going to be able to join us later today.

The Biden administration has worked to pass historic bipartisan legislation. And then, officials have been working just as hard as anyone, to set up and implement these programs. I appreciate Dr. Kathleen Hogan, from the Department of Energy, and Carlos Monje, from the Department of Transportation, joining us today to talk about their work.

And finally, we have heard from and listened to and worked with leaders in the local communities, to make sure their needs were met. I appreciate Dr. Bourque, the co-executive director of the Massachusetts Association of School Superintendents; Dr. Chen, the chancellor right here at UMass Lowell; and Mr. Lou Antonellis, from the International Brotherhood of Electrical Workers, who took the time today to give their firsthand account of how this Federal support makes a difference for families, for small business, for schools, and for communities all across the Commonwealth.

So thank you all for being with us today.

Senator Markey, you are recognized for an opening statement.

OPENING STATEMENT OF SENATOR EDWARD J. MARKEY OF MASSACHUSETTS

Senator MARKEY. Thank you so much, Madam Chair, for bringing this very important hearing to Lowell. And thank you for your leadership in fighting and leading, persistently, insistently, and battle after battle to make sure this funding actually has become a reality for Lowell and for the Commonwealth. So thank you.

And again, it is just a tribute to you that you bring this hearing right to Lowell, right to the people.

And you have already gone through the litany of all of the money, and so I won't repeat it. I will just kind of summarize it. Between the two COVID relief bills and the Infrastructure Bill, and the CHIPS Bill, and the IRA, which is the biggest climate bill in history, Massachusetts is going to receive \$135 billion.

How much is that? The entire State budget is \$56 billion. So more than twice the entire State budget is coming in in Federal money, and this, really, once-in-a-lifetime opportunity to look at that investment and to say, how can we capitalize upon all of the different opportunities?

Which is why we are so glad that all of you have come here today, because you are the experts. You are there on the ground.

You know what is happening, in terms of ensuring that we get a disproportionate share of all of the money and that it comes here to the Commonwealth, because we are smarter, we are more aggressive, and we are ready to make the applications in a timely fashion, so that we are able to bring that funding back.

So this is, for me, just such a great gathering of leaders. I am looking forward to hearing from all of you. As we go down the line here, I am obviously going to be very interested in all of the clean energy money, all of that funding. I know a lot is going to be going to UMass Lowell, grants that they are already applying for and winning. But I know that the same thing is true all across the Commonwealth. This is a revolution in infrastructure investment and we thank you, all of you, for everything that you are doing.

Thank you, Senator. Thank you, Madam Chair.

Chair WARREN. Thank you. Thank you, Senator Markey.

So today, we are going to have three panels. And I am going to introduce the two witnesses at our first panel.

I am very pleased to introduce Mr. Carlos Monje, the undersecretary of transportation for policy in the office of the Secretary of Transportation. In this role, Mr. Monje helps to oversee Build America Bureau and the implementation of the once-in-a-generation investment of the Bipartisan Infrastructure Law.

So thank you for joining us.

I also want to introduce Dr. Kathleen Hogan. Dr. Hogan is a distinguished national leader in clean energy, with a more than 20-year career as a Federal executive spanning the Environmental Protection Agency, and now the Department of Energy, where she serves as the principal deputy undersecretary for infrastructure. Thank you for being with us, Dr. Hogan.

I will turn to you, Mr. Monje, for your opening statement. You are now recognized.

STATEMENT OF CARLOS MONJE, UNDER SECRETARY OF TRANSPORTATION POLICY, DEPARTMENT OF TRANSPORTATION

Mr. MONJE. Thank you very much, Chair Warren and Senator Markey. Thank you for the opportunity to testify today and for your leadership and partnership in Washington and here in Massachusetts, as we work to build a stronger, safer transportation system.

As I speak to you today, the Department of Transportation is close to wrapping up its second year of implementing the historic Bipartisan Infrastructure Law. We have been hard at work creating new programs and making critical investments in our Nation's infrastructure. To date, across the administration, we have announced more than 38,000 projects across the country.

We actually have a map of country, with dots on it.

Chair WARREN. Is it cool?

Mr. MONJE. There is no white space. There is no white space.

Our transportation investments are making our roads safer for pedestrians, for bicyclists, and for drivers, and making transit more affordable and reliable and accessible, and reconnecting communities that have been divided by past transportation decisions.

We are making sure that these investments are not only resilient against extreme weather, but help combat the climate crisis. These are not only investments in America's infrastructure, but, as you said, Chairman, also in its workforce, creating hundreds of thousands of good-paying jobs each year in manufacturing, construction, operations, and maintenance.

On behalf of Secretary Buttigieg, I am honored to share with you, today, some of the ways in which the people of Massachusetts are benefitting from these investments, as well as other areas of the Department's work.

Safety is the Department's top priority. And in 2022, we committed to an ultimate goal of achieving zero roadway deaths through our national roadway safety strategy. I am pleased to begin by highlighting our safety investments in Massachusetts. After all, Massachusetts consistently ranks as one of the safety States in the Nation, in terms of fatalities per miles traveled and in pedestrian fatalities per capita.

The Bipartisan Infrastructure Law greatly expanded the resources we are able to put towards roadway safety, in the form of the Safe Streets and Roads For All program. To date, we have awarded more than \$30 million to 17 communities here in Massachusetts. The Safe Streets and Roads For All program is helping 15 communities across the Commonwealth, including the cities of Fitchburg, Pittsfield, Southbridge, Ware, and Worcester, to develop comprehensive roadway safety action plans.

We have awarded \$9 million to Boston, to deploy low-cost, high-value safety improvements at intersections across that city. In Springfield, we awarded \$15 million to improve safety for pedestrians and cyclists at 15 intersections and along 10 corridors that currently experience a disproportionately high number of fatal crashes.

This Safe Streets program is just one example of how we can continue to work together to make one of the safest States in the Nation even safer.

DOT is also hard at work tackling the climate crisis. As the biggest contributor to greenhouse gas emissions, transportation must also be part of the solution.

On this front, we have made significant investments in Massachusetts. Most notably, our Federal Transit Administration awarded nearly \$220 million in the last 2 years, under the BIL-funded low- and no-emission bus and bus facilities program. Through these awards, we are helping to replace diesel buses with electric and hybrid buses across the Commonwealth.

In the last fiscal year, Massachusetts received more than 10 percent of the total funding for this program. I don't know if it's disproportionate, but it was second only to California in terms of the total funding received.

These are the kinds of investments not only making transit agencies more reliable, but also giving transit riders a quieter, more pleasant experience, and communities cleaner air.

Moreover, they include efforts to prepare our transportation workforce for these newer technologies, including through apprenticeships, on-the-job training, and instructional training.

A good example is the \$6.9 million award provided here in Lowell, to the Lowell Regional Transit Authority, in June, to purchase hybrid electric buses to replace their older vehicles that had reached their useful life, and to launch a workforce development program that provides on-the-job and instructional training for the maintenance and operations of these hybrid electric vehicles.

As we make investments in the safety and climate impact of our transportation system, we are mindful that the benefits of transportation projects must also be done equitably. The Department is actively addressing environmental justice and working to undo past harms through the Reconnecting Communities, and Rebuilding American Infrastructure With Sustainability and Equity Programs. Those are two separate programs.

As part of the Biden administration's Justice40 initiative, here in Massachusetts the new Reconnecting Communities program is already helping the City of Boston assess the feasibility of reconnecting parts of Chinatown to downtown Boston, that were previously divided by the construction of the MassPike.

Meanwhile, RAISE, the other program I mentioned, is funding improvements to transit infrastructure, bridges, and roads in disadvantaged communities, in Springfield and Lynn, in New Bedford, and Brockton, and, again, right here in Lowell.

And we are funding the rehabilitation and preservation of four deficient bridges here in town, with improvements to pedestrian, bicycle, and transit accommodations.

Lastly, I want to touch on America's workforce and innovation as we look forward to building for the future. Massachusetts received nearly \$6.5 million from DOT's new BIL-funded Strengthening Mobility and Revolutionizing Transportation. It is a SMART discretionary grant program. In Massachusetts, SMART is funding SMART traffic signals in Brockton, planning for SMART grids at the Cape Cod gateway airport and at MetroWest Regional transit headquarters, and improvements to rail safety on Cape Cod, using unmanned aircraft systems and SMART sensors.

I was here in Boston, alongside Governor Healey, earlier this month to cut the ribbon on a brand new facility at DOT's Volpe Center, right in Cambridge, which will draw on some of the brightest minds to support the work across our department.

This new LEED-certified facility will provide the modern facilities need to expand advanced transportation research and house the next generation of the transportation workforce through internships, academic research partnerships, and mentoring programs.

Speaking of academic partnerships, we also recently named UMass Amherst as the lead of our New England University transportation center, along with consortium members from Bunker Hill Community College, Holyoke Community College, and MIT.

We are excited to see how they can help us advance our transportation work, particularly in both safety and equity.

And in closing, at the DOT, we see Massachusetts as a shining example when it comes to demonstrating how transportation infrastructure can be safer, more climate friendly, and a tool for building communities and encouraging innovation.

We are also encouraged by the Commonwealth's desire to go further to continue investing here in the years to come and improve

the lives of its residents and workers, to support the critical industries that reside here, and to present a model for communities across the Nation.

Thank you. I look forward to the conversation.

Chair WARREN. Thank you very much, Mr. Monje.

Dr. Hogan.

**STATEMENT OF KATHLEEN HOGAN, PRINCIPAL DEPUTY
UNDER SECRETARY FOR INFRASTRUCTURE, DEPARTMENT
OF ENERGY**

Ms. HOGAN. Chair Warren and Senator Markey, also, thank you for this opportunity for provide an update on the Department of Energy's progress in implementing the Bipartisan Infrastructure Law and the Inflation Reduction Act, which we call BIL and IRA.

So BIL and IRA truly are historic investments in renewing American infrastructure for decades to come, really for rebuilding American manufacturing and increasing American competitiveness, and important to bolstering our energy security, reducing energy costs for American families, and, as we have said, creating millions of lasting, good-paying jobs, and, of course, to do it right here in Massachusetts.

So on behalf of the Department, I truly thank you for your leadership in getting these bills over the finish line and our ongoing partnership in their implementation.

So through BIL and IRA, Congress, you all, have committed to invest more than \$90 billion over the coming decade, through the Department of Energy, and really to catalyze investment in our energy infrastructure.

To date, the Department has opened the funding for at least \$72.8 billion of that funding across the public and private sectors and, as we know, it is so important with a special mission, to ensure Tribal, underserved, and traditional energy communities have a seat at the table.

So now, we see investments are heading to many partners and energy priorities across the country, including the Commonwealth here.

Just this week, the Department announced nearly \$100 million for two projects in Massachusetts, under the Grid Resilience and Innovation Partnerships, or GRIP program, as we call it. These awards are proposed to help reduce the impacts of extreme weather events and natural disasters on the region's grid, as well as to modernize the electric power system.

In addition, the State and Tribal formula grants for grid resilience, in BIL, brought more than \$9 million to Massachusetts, which the State will, in turn, use to competitively fund projects to improve energy reliability and resilience, while addressing energy costs for consumers, as well.

BIL and IRA, as we are implementing it, are also providing substantial investments for our aged homes and buildings. Congress provided a tremendous \$3.5 billion into the Weatherization Assistance Program, which reduces energy costs for low income households by increasing the efficiency of these homes. Of that total, more than \$80 million, is allocated to Massachusetts, with 50 percent of those funds already in the State.

And in addition, in June, the Department announced the first selectees for the Renew American Schools Program, which will fund upgrades at K-through-12 public schools in areas of need. One recipient is Natick Public Schools, here in Massachusetts, who will receive more than \$2 million to fully electrify the Bennett-Hemenway Elementary School, being able to add a new heat pump and state-of-the-art automation, so that they can replace aging rooftop units.

The Department has also provided funding to two Massachusetts cities/towns, Boston and Littleton, totaling about \$1 million. And that is through the BIL funded energy efficiency and conservation block grant program.

These efforts in these two regions will be used to improve building efficiency and to increase electric load flexibility. And there will be many more local awards coming as we address the applications from communities on a rolling basis.

The Department is also working closely with the States as they work to roll out the more recent funding under the Inflation Reduction Act's home energy rebate programs. Here, the Commonwealth will receive more than \$146 millions to help households, many of them low or moderate income households, to save money on their bills, upgrade their homes, and reduce indoor and outdoor air pollution.

When we look at this program nationally, these rebates offer up to \$1 billion in home energy bill saving each year and will support more than 50,000 jobs across the country. And of course, there is even more jobs and savings available when they get paired up with IRA home improvement tax credits.

BIL is also bringing nearly \$8 million to Massachusetts through the longstanding State energy program, which assists States in meeting their energy objectives, and we look forward to seeing the work there.

So really, in closing, as the Department continues our BIL and IRA work—and as you hear, we are still in the early phases of what is a many year effort here—we really do look forward to our partnership with this Committee as we strive for a clean and secure energy future that is made in America and that creates millions of American jobs, including right here in Massachusetts.

So on behalf of the Department, again, appreciate your interest and the opportunity to be here, and I look forward to your questions. Thank you.

Chair WARREN. Thank you very much. I, again, appreciate both of you being here and appreciate all of the money you are bringing.

So we are talking about billions of dollars of investments here, and there are dozens of ways that these investments are going to help families and small businesses and communities all around the Commonwealth.

But I just want to start with transportation. Mr. Monje, you help oversee transportation policy for the Department of Transportation for our whole country. You have worked at a lot of different jobs in Federal Government for more than two decades. And I just thought you would be perfectly situated to explain a little bit about the scale of what is going on here.

When you think about your career in public service, how significant is the Federal investment in transportation projects that is occurring now, under the Biden administration?

Mr. MONJE. It is historic. You mentioned once in a generation. It might be once in a lifetime. It is certainly, for many of us at the Department of Transportation, something we have—and they, for much longer—worked their entire careers to do.

We have got more money for roads and bridges since the creation of the Eisenhower system; more money for transit in the history of the republic; more money for rail since the creation of Amtrak.

And to think of where we started at the beginning of this administration, in the depths of the pandemic, Congress wisely put a lot of resources that we put into place to save the aviation industry, to save the transit agencies all across the country.

And as a result, 14 million jobs have been recreated during this administration, and 336,000 just in the last month. And we have got more jobs for women, for people of color, for people with disabilities, in decades.

Chair WARREN. More good union jobs?

Mr. MONJE. Union jobs.

It is a golden age for unions. And most of the lowest inflation of any major economy in the world.

Chair WARREN. Tell you what. We will come back to some of these. I just want to make sure we get this laid out, because we also did some research on this.

This is the largest Federal investment in public transit ever. It is the largest Federal investment in passenger rail since the creation of Amtrak. It is the single largest dedicated investment in bridges, since the construction of the interstate highway system.

So all powerfully important.

Can I ask you—I just want to drill down one of these, and that is bridge funding, which has been particularly important right here in Lowell.

Mr. Monje, how much Federal funding is Massachusetts set to receive through the Bipartisan Infrastructure Law for bridge replacement and repairs?

Mr. MONJE. Yes, ma'am.

Just in terms of Federal highway formula dollars, it is \$5.4 billion over 5 years, and that is \$243.5 million for each of the fiscal years, for just the bridge formula funding.

And as you know, Massachusetts, before the bill was passed, there are 472 bridges and more than 1,100 miles of highway that were in poor condition. And that is just the formula dollars.

I have a list in this packet, somewhere of just a sentence on each project that has won a discretionary grant, and it is 14 pages. 14 pages worth of all of the projects. I will have to have a shorthand if you ask on any one of them, because there are just so many. Massachusetts is competing and winning for these dollars and is doing extremely well.

And that is combined with money that is coming from the Commonwealth, as well, in the Next Generation Bridges program.

Chair WARREN. That is terrific.

And it is also good to see that we are pouring money in to make sure that our public transit system is greener.

To date, the Bipartisan Infrastructure Law has awarded Massachusetts about \$135 million for clean transit buses and improved bus service through a Department of Transportation program aimed at helping State and local governments purchase either zero-emission or low-emission buses and the facilities needed to support these buses.

Mr. Monje, could I just ask you?

Is investing in low-emission or zero-emission buses something that, if we didn't do this at the Federal level, then the State and local governments typically would be able to pick it up on their own and make that transition from old, dirty diesel buses to these clean new buses?

Mr. MONJE. No, ma'am. I think the Federal investments are critical. And as you know, we have provided a record investment, \$1 billion a year. It is six times what we were funding before.

And these vehicles are critical. We have already awarded grants to build more than 1,800 America-made zero-emission buses. And Massachusetts, again, is competing and winning, including recent grant here, that is going to purchase seven zero-emission buses. It is critical and a key piece of decarbonizing the sector.

Chair WARREN. I want to add, I really appreciate the Department of Transportation not only is helping us replace the buses; it is also helping build the facilities so you have got charging stations and can actually keep them up and running.

Mr. MONJE. Yes, ma'am.

Chair WARREN. So we are reducing the cost for our towns on this.

I also want to ask about what it means to be unlocking scientific advances that will fuel the next generation of energy technology. I feel like, in this area, Massachusetts has no equal. We have researchers at UMass Lowell and MIT and Northeastern, who are already using Federal funding to develop new semiconductor materials, to test and monitor drinking water for communities across the Commonwealth, and to create academic networks to increase engineering degrees among underrepresented groups.

Government-supported research has long been a critical ingredient in generating innovation that supercharges our economy. And that is why one of my top goals, from the day I was elected to the Senate, has been to double the funding for the National Science Foundation, which is our Government's premier research program for scientific research.

And it is also why I introduced legislation called the National Institutes of Clean Energy Act, to invest \$400 billion in a system of institutes at the Department of Energy, dedicated to research and development of advanced clean energy technology.

Now the CHIP and Science Act, which Congress passed last year, set up a program very similar to the one I had proposed. When fully funded, it will send billions dollars to the Department of Energy to invest in basic scientific research related to clean energy technology.

Dr. Hogan, we often talk in fields like biology or chemistry, how basic research can unlock advances, for example, in treating cancer. How does the work that our research universities and our na-

tional laboratories do on basic science of energy help us in the long run, to fight climate change?

Ms. HOGAN. Well, what a great question as we sit here and talk about sort of putting technology to work today.

Chair WARREN. School buses?

Ms. HOGAN. But what we are not talking about is why these technologies are here today. And it is because of the work we did in basic science many years ago. Right?

So think about the materials discovery side of things, as one example. And you are already talking about what is going into semiconductors. So basic science is really just critical to us keeping a pace with the solutions of the future.

And we talk about the revolution we are going through right now, with electric vehicles, but we have more work to do there. They are great now. But they can keep being better. Right? So we can have better materials, lower cost, more variety, et cetera. And it does go back to the work we need to do with basic science.

One of the efforts that we are very excited about at the Department of Energy that we have launched, is our eight energy earth shots. So what is behind those earth shots? It is really putting together really difficult goals for the future, around some of the hardest issues in addressing the climate problem, and a way to put our arms around the discovery you need to do in basic science and pull it together with our applied science programs at the Department because, again, these are all part of what we need to do to make as quick progress we can on these very important problems.

Chair WARREN. That is terrific. And I just want to dig a little deeper on one piece of that. And that is, how Federal funding helps us grow our economy.

And I am thinking right now about batteries and the work that is being done around batteries. The Department of Energy has created, out of the Bipartisan Infrastructure Law, these energy innovation hubs focused on spurring innovations about batteries. Now batteries are going to be critical to our clean energy goals, particularly when it comes to the transition to electric vehicles.

Dr. Hogan, can you just say a word about why with Federal funding for something as basic as batteries is so important to accelerate the growth of the electric vehicle market?

Ms. HOGAN. Yes, absolutely. Thank you for that. Because, again, we are living through this. And there is so many things we need to get right as we do this.

We want there to be a lot of accessibility to the batteries. So when you bring Federal funding to the table, more people can have access to high quality batteries. This is kind of a global thing that is going on right now. And for us to play in this country and have as many people play as possible, it takes the money to make that happen, so that we are not left behind.

So there is the accessibility issue that is critical.

But the other very important opportunity we have in front of us is the manufacturing of all of these batteries, both for transportation and for our grid as well.

With the help of the investments from the Bipartisan Infrastructure Law, we will be increasing the supply of the whole battery supply chain in this country, in many corners of the country.

Chair WARREN. That was my third question. So it is basic research, it is batteries. But could you say a little bit more about how the work you are doing is also about supply chains and why this is so critical to a clean future?

Ms. HOGAN. Yes. So I have talked a little bit about how this is a global change. As we know, there is lots of countries that then have the opportunity to pick up the new investments and then sort of own that part of the supply chain. This is our opportunity in this country to cement and secure our energy supply chains around batteries and other clean energy opportunities, as well.

We talk about onshoring, reshoring, or just making sure that it is made here, as we grow out some of these opportunities.

So that is really the critical aspect of this. And we don't have to say the word, "geopolitical issues," too much, I think, to really underscore why it is so important to get this right, right now.

Chair WARREN. That is really terrific.

Thank you, Dr. Hogan. Thank you, both.

Really appreciate your being here.

Senator MARKEY.

Senator MARKEY. Great. Thank you.

Mr. Under Secretary, I heard you mention earlier, California is number one and Massachusetts is number two.

What category was that?

Mr. MONJE. Of the funding?

Chair WARREN. Everything.

Mr. MONJE. With the bus program, yes.

Senator MARKEY. I am not sure everyone heard it.

Mr. MONJE. It is number two State behind California. And Massachusetts has a lot of people, but not quite as many as California. So you are doing extremely well.

Senator MARKEY. In terms of what?

Mr. MONJE. Is terms of discretionary grants for low and no bus grants.

Senator MARKEY. And by the way, California is number one, we are number two, in NIH funding. California is number one, we are number two, in National Science Foundation funding.

Mr. MONJE. Yes, sir.

Senator MARKEY. We are not just the Bay State; we are the Brain State as well. So we are six times smaller than California. But in actual dollars, we compete.

Mr. MONJE. Very well, yes, sir.

Senator MARKEY. Then that goes into our economy and it makes all of the difference in the world.

And what I would like to do, if I could, is to just turn to the issue of passenger rail, inter-city passenger rail, because it works to increase productivity, but it can also reduce greenhouse gases from going up into the atmosphere as well.

So could you talk a little bit about the east-west rail, \$108 million grant? Because I think it would help to explain what we are trying to do to make sure that we are expanding upon the vision of the administration.

Mr. MONJE. Yes, sir. We are very excited about this project. The Federal Rail Administration has about \$66 billion that it is spending on rail. And again, a big chunk of it is coming to Massachu-

setts. And as you mentioned, \$108 million through our CRISI grant program.

And basically, what you have got is a rail line that is run by CSX, a freight rail that runs east to west. And we gave \$108 million to upgrade and, in many cases, to provide double tracking, to re-engineer the geometry of the rail, and make sure that there is poll sites, so that we can de-conflict those rails and add twice-a-day service east-west and provide an alternative to the NEC.

It is one of the great projects that we were able to fund in the first couple years.

Senator MARKEY. Please make sure you get those rails correct, because we are going to have a Green Line problem.

Mr. MONJE. Yes, sir.

Senator MARKEY. Just make sure that happens.

And Doctor, I would love to talk to you about the Renew America Program that you talked about for Natick High School. Obviously, we need a Green New Deal for public schools in America, so they can move to the future and that kids can be in healthy environments.

So can you talk a little bit about that program? I understand that upwards of \$5.5 billion worth of applications went in for that program across the country, just showing the needs that exist in public schools for these kinds of clean energy programs.

Ms. HOGAN. Absolutely. As you point out, Congress provided the Department with \$500 million for this program. It is a brand new program, so we didn't really know what type of interest/demand there would be for it.

We put out a first-year solicitation at the level of \$80 million, but the applications that we got for that were over \$5 billion. So we were able then to take 2 years of the appropriations that Congress had given us for that first round of awards, really trying to provide the money to improve as many schools as possible, relative to what we had then. And we will have more solicitations in the future.

But you are absolutely right. It was 10 times oversubscribed with good applications to help schools. The other aspect of this is it is all schools in needy areas. The kids have to, in these schools, have a high percentage of being on lunch voucher programs. So these are aged schools, schools with kids in need, and it is really an opportunity to improve, not just the energy efficiency, but the learning environment and address the indoor air quality as well.

Senator MARKEY. This leftover asbestos problems and lead problems from earlier generations that are still there and befouling the air, the environment in which children are trying to learn.

And I am just going to follow up for a second on what Senator Warren was talking about in this battery technology area.

We are a special place. And Green Town, we have 300 start-up companies in Green Town, in Somerville. And all of them qualify for the tax break, for the post part, that was in the IRA. Joe Manchin calls it that. We call it the biggest climate bill in the history of the world. So that is what it was.

And the appetite for this funding is enormous. It is not \$369 billion. It is more like \$1 trillion, \$369 billion dollars.

And I saw a picture of Joe Manchin standing next to Secretary Granholm, in West Virginia, cutting the ribbon on a new battery plant down in West Virginia, saying 800 jobs are going to be there.

And there should be a comma in that sentence, saying, and that battery technology comes from Somerville, Massachusetts, and Green Town, which invented that technology, developed that technology and has hundreds of workers here as well.

And we will spreading that technology across the country and not using lithium ion, but using iron, I-R-O-N, the second most common element in the world.

So the breakthroughs that UMass Lowell, breakthroughs in Green Town, the breakthroughs all across this State, it has absolutely electrified this State to electrify the country.

And we thank you for all of the work that the two of you are doing in order to make that transition telescoping in time, because of the urgency of problems. Thank you.

Chair WARREN. Thank you very much.

Thank you, Mr. Monje. Thank you, Dr. Hogan. We appreciate your being here.

And now we call up Governor Healey.

Thank you.

Ms. HEALEY. Good afternoon.

Chair WARREN. Good afternoon.

So I am pleased to introduce the Honorable Maura Healey, the 73rd governor of Massachusetts.

Since assuming office in January, Governor Healey and her administration have been a force. Just yesterday, she issued an executive order that officially establishes the Federal funds and infrastructure office to help ensure that Massachusetts is equipped to make the most of this funding in every city and every town across the Commonwealth.

Ed and I could not ask for a better partner in the State House and we are grateful to the Governor for taking the time to join us today. I will now turn this over to Governor Healey for her opening statement.

Governor Healey, you are recognized.

STATEMENT OF MAURA HEALEY, GOVERNOR, COMMONWEALTH OF MASSACHUSETTS

Ms. HEALEY. Well, good afternoon, Senator Warren and Senator Markey.

It is a pleasure to be with you here and in the historic and vibrant city of Lowell. I couldn't think of better place for this convening, and I welcome the opportunity to testify about the critical importance of Federal funding to our State's goals and our future.

Massachusetts is a State of firsts, as we know. The first State constitution, public school, library, and park. We built the first lighthouse, railroad, and subway. And here in Lowell, one of the great centers of industry, so much was accomplished.

Now, also, I know that you had an opportunity to spend time with our Lieutenant Governor, Kim Driscoll, earlier today, and other members of our administration. Know that our entire team sees our responsibility as an obligation to lead today, in leading in ways to protect the rights and well-being of our people, and to fear-

lessly tackle the biggest challenges our Nation and our world are facing.

Since taking office in January, we have led the fight on climate change. We appointed the Nation's first cabinet-level climate change position in the State's first under secretary for environmental justice and equity. We launched the Nation's first State climate bank dedicated to affordable housing. We extended our clean energy lead and issued the largest RFP for offshore wind in Massachusetts history. We banned State purchases of single-use plastics and launched the strongest biodiversity conservation program in the Nation.

We have also led on the fight to lower costs for families, seniors, and businesses. Last month, we signed into law the most generous universal child and dependant tax credit in America. And this week, we filed the Affordable Homes Act, which would be the biggest investment in housing affordability in our State's history.

We have led on education. Our first budget funded, permanent, free school meals, breakfast and lunch, for all public school students, and free community college for those 25 years and older.

We have rallied to advance equitable access to higher education in the wake of a misguided Supreme Court decision on college admissions; we have defended reproductive rights and the safety of our LGBTQ youth.

We are leading. But the challenges we face are generational in consequence and global in scale. That is why your leadership in Congress, in partnership with the Biden-Harris administration, has been so inspiring and critical to our efforts.

You have enacted some of the most ambitious investments in America's history, stamping this legislation with Massachusetts values, from Senator Warren's fight to lower prescription drug costs, to Senator Markey's pioneering climate bank vision.

The intent of these investments and the requirements for States to secure them are closely aligned with our visions, our policies, our work here in Massachusetts. And our partnership with the Federal Government has the potential to make the deepest impact and set the highest standards for our country's progress.

Federal infrastructure funding will not only help Massachusetts make long overdue repairs to our roads, rails, and bridges; it will allow us to create good, accessible jobs and to strengthen community and coastal resilience. That is why our applications for Cape Cod bridge funding and the Alston multimodal project include commitments to advance the legislation's goals of high labor standards and pathways to good, middle-class careers for women and men of color.

The Federal clean energy funding through the Inflation Reduction Act will not only help us achieve net-zero carbon by 2050, it will help us create green jobs, affordable housing, and environmental justice for our communities.

We are planning on using all of our resources inside and outside of Government to match funding opportunities with our decarbonization goals. That includes the community climate bank, which will finance the decarbonization of our building sector while expanding affordable houses for our people.

Yesterday, we announced our application for \$250 million in clean energy Solar For All investments. This will be for up to 78,500 affordable homes, from the EPA's Greenhouse Gas Reduction Fund, the largest emission-reduction initiative in U.S. history.

In addition, Federal funding for advanced manufacturing through the CHIPS Act and so much more, will allow Massachusetts to not only lengthen our lead, but to broaden access to good innovation economy jobs.

We are working with industry to expand workforce development pathways, starting with historic investments in STEM education in our schools, which we celebrated, here, STEM week in Massachusetts this week. Already, we won the Department of Defense competition under the CHIPS Act, to host the Northeast Microelectronics Hub, with plans for workforce training in advanced manufacturing.

And we have been named an investor catalyst hub for ARPA-H, the National Institute of Health's medical innovation program for transforming health care, in part because of our proven commitment to health equity.

From the first days of our administration, competing for and winning Federal funding has been one of our highest priorities.

We established a Federal funds infrastructure office under Director Quentin Palfrey to guide this work across our administration and to work to rally partners in local government, business, academia, and labor. We are getting results. And we have the opportunity to, we believe, to do so much more.

What Federal funding means for Massachusetts is an economy that brings opportunity to all of our residents and solutions to our Nation's and our world's most pressing challenges.

I thank you once again for the opportunity to testify and be here today. And I thank you for all of your tremendous advocacy on behalf of the residents of Massachusetts.

Chair WARREN. Well, thank you. It is terrific to have you here today.

Your administration has hit the ground running and we are proud to be your partners in making sure that the Federal Government, in Washington, is providing resources needed to support both infrastructure and economic development right here in the Commonwealth.

Now, we have been talking all day about the historic scale of Federal investments that have been made during President Biden's first 2 years in office, everything from bridges to scientific research to public transit. But as unprecedented as these investments are, there are still a limited number of Federal dollars available. That means there is fierce competition all across the county to bring these dollars home.

In many cases, States and localities must demonstrate that they are willing to bring their funds to the table to combine with Federal dollars, in order to receive Federal grant.

So Governor Healey, can you just say a little about, how did you approach the task of making sure that Massachusetts would have the matching funds that it would need to be competitive to win Federal grants?

Ms. HEALEY. I appreciate the question and could not agree more as to your characterization of the fierceness of the competition among our sister States, and also cities, chasing hard after these Federal dollars.

And again, unprecedented funding available through the actions of the Biden-Harris administration and through the work of you all in Congress.

So it was our estimate that there is about \$17.5 billion available in Federal funding. The combined applications require as much as \$3 billion in State matching funds to be eligible to maximize how much we might be able to be awarded. So \$3 billion in the State obligation, all together.

We have already got \$2 billion. We worked hard to put \$2 billion and make that available for this purpose. And just yesterday, we took another big step forward.

And what we did is file legislation specifically to create what we are calling a capital investment and debt reduction fund. This will allow us to leverage the interest that has accrued in what is a historically high stabilization fund and use that money to support pay-go funding.

It is capital in hand. We estimate that, over the next 3 years, it will be able to unlock approximately \$800 million in resources that can be applied to pursue Federal funding opportunities.

Importantly, it will also include \$50 million for municipal matching grants in a local infrastructure bank. And this is a resource that our cities and towns can use to finance infrastructure projects and support Federal grant applications.

So that is one thing that I wanted you to know about, in terms of our ability to compete. It is making sure that we show the State has skin in the game, that we are doing our part in making, not just words, but action and money available to pursue, leverage, and maximize opportunities for Federal funding.

Also it is very important to create the director position, to create the office of Federal funds and infrastructure. It is a whole-of-Government approach that we are using to make sure that that office is working with every single secretary and agency, both to help identify Federal funding opportunities to help our teams make and put forward the very best application for those funding opportunities, and to track things.

We also formed an advisory council because we know how important it is for teams to be meeting regularly. This is a biweekly inter-agency coordination effort, so that we are holding one another accountable throughout the administration. They also maintain a State clearinghouse for tracking Federal grant opportunities and agency applications.

And we recently established, as well, a Federal funds partnership for municipalities and Tribes. We thought this was very important because we need to make sure that our cities and towns, our Tribes, our regional planning authorities, have the support that they need; first off, that they know what is available. Because, as we know, not every city or town or Tribe has the bandwidth to be able to spend the time to identify Federal funding opportunities, saying nothing of the infrastructure to actually do the work in completing applications.

So we wanted to make sure that we were helping them both identify and then make those applications.

Those are just some of the things that we have done that I think have put us in a position to really rally team Massachusetts. And I think you are not afraid of sports analogies, I know, both of you.

Chair WARREN. We are fine with it.

Ms. HEALEY. That team spirit is really something we are trying to promote. I think it was one of the reasons we were able to win ARPA-H, because we really rallied through this team Massachusetts approach, bringing together the business, academic, non-profits, labor communities, to show who we are and show what we are capable of in Massachusetts.

Chair WARREN. I just want to say, you have only been here 9 months. And that really is extraordinary. Because we are talking about the unprecedented amount of money that is available. But this money is not available just because someone puts it in a nice, big box, puts a ribbon on top, and hands it over. People have to get out and compete for it.

And you and your team have just done an extraordinary job of lining up Massachusetts and Massachusetts schools, Massachusetts towns, Massachusetts institutions, Massachusetts companies, to take maximum advantage of every Federal dollar that you can get your hands on.

And all I can say is, Ed and I are there all the way with you on this.

I am just going to ask you one more question and then hand it over to Senator Markey.

And that is, we have talked about a lot of the projects, we have talked a lot about the bridges, we have talked some about transit, both mass transit, school buses, and so on.

Where else are Federal resources needed to help grow the economy in the Commonwealth? We always want to ask for more.

Ms. HEALEY. And I always will.

All of the areas that you mentioned are very important. I would add to that, coastal resilience, with the severity of the storms that we have seen and the impact on existing and antiquated infrastructure, we really need help in that area as well.

I mentioned our greenhouse gas reduction fund for a reason. This is a generational opportunity here. And now, States are eligible to compete for the Solar For All program to really accelerate solar deployment. Our team, my team, identified places in Massachusetts where there is more capacity for solar. So we have the capacity. But the question is, how do we actually get this built? So we need assistance and the Federal resources to make that happen.

Our climate bank has identified nearly 30,000 affordable rental homes that are eligible to be retrofitted with EPA funding over the next 5 years, and this is really important, in terms of investment.

Some of our infrastructure needs Statewide:

Williamsburg. I look at the Williamsburg Route 9 reconstruction, and it is important. We applied for \$44 million to help with rural surface transportation. This would modernize and reconstruct Route 9. It is a critical east-west freight route in the region that is very important, that has safety and resilience needs.

We also applied for another infrastructure improvement project that travels along a part of Route 7, that goes over the Kampoosa Brook in Stockbridge. This requests \$2.8 million in Federal funding, combined with \$630,000 of State funds, to replace a drainage system and allow for the safe passage of wildlife, including nine State-listed rare species, which also supports our biodiversity goals.

We have applications out for U.S. DOT protect grant funds. These are, again, central to flood protection in places like Route 20, in Worcester, at the exchange of Route 20 and Grafton Street; on Morrissey Boulevard, in Dorchester; as well as a Statewide planning study to identify more flood-prone transportation infrastructure needs.

So those are just some of the areas that come to mind. I mean, there is no shortage of work that we need to do.

I can't be here in the proximity to the Merrimack without mentioning the work that we need to do in the Merrimack, in terms of shoring up some of the CSOs and the other infrastructure along the banks. Efforts were made to really clean up that river. And unfortunately, with antiquated infrastructure and the inability of municipalities and towns to really come up with the funds to deal with it, we don't want to go backwards. And I just want to point that out, as we are in close proximity here.

Chair WARREN. We can see it out the window here.

Senator Markey.

Senator MARKEY. Thank you.

The Markey family is here because of the Merrimack. They left Ireland to come here and work in the mills, and that was the Industrial Revolution. And now, you are leading a second industrial revolution, you are looking at in the perspective of reclaiming these old assets and opening up innovation for a way in which young people in our State can lift their gaze to the constellation of possibilities, regardless of their race, regardless of their income or country of origin.

And that is why I think Senator Warren and I, as you completed your opening statement and your answers to Senator Warren's questions, I think we were both giving you a standing ovation in our brains, listening to the incredible vision that you have for the Commonwealth and for the Commonwealth, what you have done already.

So could you perhaps turn to those communities of color, those historically underserved communities and talk about what your vision is, going forward, in terms of using all of these Federal funds and leveraging it in a way to ensure that we deal with those still historically un-dealt-with issues, the legacy of the past?

Ms. HEALEY. I appreciate all of your advocacy in this area in particular, Senator Markey.

Equity is really in the center of everything we do. There is an equity lens on every policy decision made across our administration.

And we know that, for far too long, certain groups have been shut out of opportunities, including funding opportunities. We have an opportunity, now, to address that. And it starts with a recognition of the disparities. It starts with an understanding of the history and how we end up with some of these really disproportionate

and disparate results. And it starts with an engagement around being very intentional as a team, as an administration, about getting after it.

When I mention a vehicle, the Federal funds partnership for municipalities and Tribes, it is an example of an important vehicle to make sure that those communities have access to Federal funds.

The same is true, I mentioned the \$50 million assistance to municipalities in terms of matching grants and a local infrastructure bank that we included in our matching funds legislation. We also included an additional \$12 million set aside for technical assistance to underresourced local governments.

The community climate bank, which is really focused on decarbonization of our building sector, is focused on dealing with affordable low income housing situations that we know are just really lacking.

And so it is those measures. I think about MVP. This is our municipal vulnerability preparedness fund. We relaunched it, 2.0, standing out at Belle Isle Marsh not too long ago. And the idea was to do that new State funding program in a way that focuses on environmental justice communities. I call them environmental injustice communities, because these are the ones, predominantly low income, predominantly communities of color, that have been overburdened and underresourced for far too long.

I think, also, the fact that we established, for the first time, an under secretary of environmental justice, speaks to the commitment that we have as an administration on this.

Even the housing bond bill that I filed yesterday, or the day before, is very intentional in its focus on addressing issues of environmental injustice as we build housing retrofit going forward.

So these are some of the ways.

I will always be that civil rights lawyer, though I don't know exactly the State of my bar card these days.

But that ethos, that lens stays with me, as it did as Attorney General. It certainly does as Governor. And we have a team that really does center equity in all that we do.

Senator MARKEY. I appreciate very much the fact that you see Chelsea every day, you see Lawrence every day. It is part of your makeup. And they going to be front and center, Black, Brown, indigenous communities. Because ultimately, they are our future. They are our workforce. They are our hopes and dreams for the whole 21st century in this State. Very much appreciate that.

Ms. HEALEY. I appreciate that.

I think we do have an opportunity, like never before, to actually get after it and address those disparities. And I think it is a huge opportunity.

Senator MARKEY. If I may ask just more one quick question?

Chair WARREN. Of course.

Senator MARKEY. And that comes back to your climate bank. It took me many years to get this national climate bank up. It is \$20 billion. McKenzie says it is going to leverage \$200 billion worth of private sector money. It is going to be tens of thousands of potential jobs. Even in Massachusetts, there are going to be tens of thousands of projects to get leveraged out of it. And there is a \$7 billion

Solar For All program on top that \$20 billion, that you can apply for.

Could you talk about those programs, your bank that you are starting, plus your ability to apply for it and qualify for loans that will be coming out, very low-interest loans out of the solar bank, out of the climate bank, to leverage, union jobs, on the one hand, and then community development with equity, on the other.

Ms. HEALEY. This is something I am really excited about.

The climate bank, in particular, was something we announced early on, that we wanted to do. We wanted to do it in a way that hadn't been done before in the country, and that is to focus it on affordable housing.

But what we have known and what I have come to learn from our fantastic climate chief, the country's first climate chief—she sits on top of everything—Melissa Hoffer, is what we can do with the leveraging of private investment and how you can take a single dollar and turn into 10 or 14, or maybe even more.

And so the idea is we establish this bank. We seed it. I have already got the \$50 million to seed it. And then we look for additional funding, whether through the Federal Government or through private investment. And that is how we are going to grow this.

We have a team set up working, already, to identify uses and applications. It is housed within Mass. Housing, which is a quasi-State agency. Very conversant in financing and lending arrangements and will be ready to go.

That is the climate bank. Very excited about that.

And Solar For All, as I say, we have done the work already, being able to identify where we can make use of additional capacity in Massachusetts. While we have our four seasons, it is still the case that there is sufficient sun for a sufficient number of days, and we have got a lot more opportunity to make use of that.

Thinking about how we can do that through these loans, which are unbelievable in scale. \$7 billion we get to compete for. Thinking about now, our teams, is how to operationalize. We don't get want to get ahead of ourselves, but we want to be ready to go. And so identifying actual sites, particularly sites that make sense.

How do we think about siting solar in a way that is not going to do environmental harm, that is not going to disadvantage communities, but that makes sense strategically. That is where we are right now, and I am very excited about the Solar For All program.

Senator MARKEY. You are the national leader. Thank you.

Chair WARREN. Yes. And we both thank you for being here today, but we thank you for the work you have done for 9 months now, and we look forward to the work you do for many, many more months and years into the future. You are a terrific partner, and that is how we get things done.

Ms. HEALEY. Thank you very much for the opportunity to testify. Thank you for the tremendous partner that both of you and your teams have been to the administration and to the Commonwealth of Massachusetts. We are grateful.

Chair WARREN. You can count on us. Thank you.

And now I would like to call up our third panel, please.

Chair WARREN. So welcome to our third panel here.

I am pleased to introduce Mr. Lou Antonellis, the business manager and financial secretary of the International Brotherhood of Electrical workers. Mr. Antonellis was elected as the union president of the International Brotherhood of Electrical Workers in the Local 103 chapter, back in 2014. He has a strong track record of fighting for good, green, union jobs across the Commonwealth.

Thank you for joining us.

Next, we have Dr. Julie Chen, who serves as chancellor of UMass Lowell. Chancellor Chen was unanimously appointed by the UMass trustees in May 2022, and she became just the second woman to lead a university with more than 18,000 students.

Thank you for joining us, Chancellor Chen, and thank you to your entire team at UMass Lowell for welcoming us today.

And last, we have Dr. Mary Bourque.

Dr. Bourque has been an educator for over 30 years and is currently the co-executive director of the Massachusetts Association of School Superintendents. Dr. Bourque was formerly the superintendent of the Chelsea Public Schools. And in 2017, Dr. Bourque was named Massachusetts State superintendent of the year.

Thank you very much for joining us, Dr. Bourque.

So I will turn to you now, Mr. Antonellis, for your opening statement.

STATEMENT OF LOU ANTONELLIS, BUSINESS MANAGER AND FINANCIAL SECRETARY, INTERNATIONAL BROTHERHOOD OF ELECTRICAL WORKERS

Mr. ANTONELLIS. Thank you. Thank you, Senator Warren. Thank you, Senator Markey.

It is great to be back here in Lowell. The last time I was actually in this building was for the ribbon cutting and grand opening back in September of 2014, almost 10 years ago. So the building looks as magnificent today as it did back then. So kudos, Chancellor.

Local 103 members and contractors have a lot of recent history—we have a deep history, but even a more recent history here in Lowell. We performed all of the electrical and telecommunications work when this building was built. We also built the University Ave. Bridge that you see out the window here, and the Lowell General Hospital's most recent addition and renovation, across the river.

But I do appreciate the opportunity to be here today to discuss the incredible work IBEW members do and the opportunities that new Federal infrastructure and clean energy funding has created for our members here in Massachusetts.

And I want you to know that I drove up here in my American made and UAW-assembled all-electric Ford Lightning pickup truck. In fact, Local 103 has an entire fleet of electric vehicles. We are putting our money where our mouth is and showing our commitment to the move to a clean, green electrical infrastructure.

We are setting the example for our members and we are installing 100 EV chargers at our campus headquarters in Dorchester. So I hope to see both of you driving around in Government-issued electric SUVs sometime very soon.

But I also want to thank our entire delegation for their hard work in bringing billions of dollars in Federal infrastructure and

clean energy funding into Massachusetts. We are taking advantage of it, and our members are already hard at work helping businesses, homeowners, school districts, and communities across the Commonwealth use that funding to develop and adapt clean energy technology for the future.

This year, the Boston Public Schools rolled out the first 20 of a fleet of electric buses that will grow to 700 electric buses by 2030. These buses were made possible by \$7 million in Federal funds and by the hard work of IBEW 103 members, who worked with the school district to design and install the infrastructure they need to electrify their bus fleet.

Speaking of buses, the MBTA is also making progress on that front, as well. With the help of IBEW members and Federal infrastructure dollars, we are excited to be building a new electric bus facility in Quincy, and, by 2026, it will be ready to host the MBTA's new electric bus fleet.

IBEW 103 members are also helping residential buildings add electric vehicle charging systems into their parking infrastructure, because residents are rapidly switching to electric vehicles.

And it is not just electric vehicle chargers that IBEW members are installing. We are also building solar projects across the Commonwealth. And as EPA's Solar For All grants start coming to communities in Massachusetts, thanks in part to your advocacy, we will be ready to help homeowners take a big step towards zero emissions.

As Federal dollars continue to flow in and kickstart more and more projects, IBEW is going to be right there. We are doing our part to ensure the electrical workforce we need, is ready to hit the ground running. We have seen our membership grow by almost 2,500 additional members in the past several years, and we plan to double that growth over the next 5 years, so we can be prepared to meet the Commonwealth's clean energy goals.

We have made substantial and strategic investments in workforce development and training, of more than \$10 million, to create and train a pipeline of workers to meet the demand. A key piece of our plan to do that is expanding and diversifying the electrical workforce of the IBEW. I am proud to share that, in our most recent apprenticeship class, more than 50 percent of participants are women and people of color. This was our most diverse apprenticeship class ever, and we plan to keep building on that progress.

Our membership is committed to reflect the diversity of the communities in which we live and work. This is critical for two reasons. The shows the world that the IBEW knows how to meet the moment, and we are doing it through inclusivity. And even more importantly, it shows young women and people of color that a real career in the electrical industry, with great pay and benefits, is available to them.

And thanks to the work of Governor Healey and Lieutenant Governor Driscoll, our administration, and our elected officials, we are seeing unprecedented investments, creating new and unique opportunities for IBEW members.

We are committed to making sure everyone in the Commonwealth, families, businesses, local governments and workers, reap those benefits.

So again, I want to thank you both very much for the opportunity to be here today, and I look forward to discussing further how important Federal investments in infrastructure and clean energy are good for Massachusetts and good for its union workforce. Thank you.

Chair WARREN. Thank you very much. Thank you, Mr. Antonellis. Chancellor Chen.

STATEMENT OF JULIE CHEN, CHANCELLOR, UNIVERSITY OF MASSACHUSETTS LOWELL

Ms. CHEN. Yes. So Chair Warren, Senator Markey, thank you for the opportunity to testify today about the profound and transformative economic impact of Federal investments in Massachusetts.

It is an honor to welcome you to Lowell, a city that was founded on innovation and entrepreneurship and transformed by the National Park Service's investment in sharing that history.

Federal investments, particularly through the Commonwealth's research universities, have played a pivotal role in inspiring innovation and bolstering research and development in the Commonwealth.

Here at UMass Lowell, these projects hold the potential to, for example, convert greenhouse gases to clean burning fuels; target RNA molecules to aid in early disease detection; and ensure water quality in underserved communities.

These things create jobs, economic growth and, as we see, research converted into technology, technology into businesses, and businesses into the cutting edge industries of tomorrow.

For UMass Lowell and countless organizations in Massachusetts and across the country, it is Federal funding that creates bold ideas, innovative theories, and then transforms them into tangible technology and societal impact. Federal agencies have referred, like the National Science Foundation, the National Institutes of Health, the EPA, the Departments of Transportation and Energy and Defense, these all play a critical role in terms of this Federal investment in the Commonwealth.

And Federal funds from these agencies invest in ideas such as—using, as we heard, IRA and BIL, the Inflation Reduction Act, to create community-based energy efficiency programs to combat climate change and save residents of underserved communities needed money on their monthly electric bills.

Using CARES Act funds during the pandemic, to enhance our medical manufacturing capacity, provide personal protective equipment, and create training opportunities.

Using ARPA money via a Mass. tech collaborative, to provide equitable access to high-speed Internet and digital literacy to gateway city and underserved communities in the Merrimack Valley.

And using NIH funding, to develop point-of-care technologies that target heart, lung, blood, and sleep disorders, especially in underserved populations.

These investments bolster economic investment, create good paying jobs and high tech opportunities for our State's workforce, and provide professional and research experiences for our students, and

also promote equity outcomes across health care infrastructure and clean energy production.

Today, UMass Lowell is actively working to accelerate this model of success on our East Campus, just around the corner. Through the redevelopment of underutilized land, the university will create a mixed-use district in downtown Lowell, with R&D and industry collaboration as its core.

This co-location of faculty, researchers, students, industry, Government, nonprofits, this has been the key to UMass Lowell's rapidly growing \$100 million research enterprise. And from startups to joint research centers with major corporations, our commitment to collaboration has attracted business partners to our shared research facilities, innovation hub business incubators, and the Massachusetts Medical Device Development, or M2D2, Center, which is run jointly with the UMass Chan Medical School.

M2D2 was one of the first nine Johnson & Johnson life sciences innovation labs worldwide. And through barter of the biomedical advanced research and development authority funding, M2D2 supported more than 80 companies, 32 who worked to develop life-saving solutions in response to the COVID-19 public health crisis.

This recognition by industry, coupled with critical Federal investments, have created clusters of expertise around technology, around health sciences, around life sciences, and biotech.

I was proud to join President Marty Meehan, last November, in an OpEd in the Boston Globe, as part of a Statewide push by industry, nonprofits, and State agencies urging the Biden administration to locate the advanced research projects's agency for health, or ARPA-H hub, in Massachusetts, and I was thrilled by Governor Healey's announcement last month that the State had succeeded.

And while we know that the technical depth and breadth of our university's and industry representatives were no doubt key to the success and administration's choice as important, as important, I believe, is the history and culture of collaboration between Massachusetts legislators, the organizations here in this Commonwealth, and researchers, to translate goals and aspirations into research that help real people.

In fact, 5 days before the ARPA-H announcement, we witnessed a similar outcome. The Healey-Driscoll administration announced that Massachusetts would receive nearly \$20 million through the Federal CHIPS and Science Act to establish the Northeast microelectronics coalition hub.

We are delighted to join with our Massachusetts industry and educational partners to help meet the Nation's microelectronics requirements, stimulate job creation, train the next generation of STEM workers, and build the region's advanced manufacturing and technology sectors.

UMass Lowell, the Commonwealth, and the country are already beginning to see the tangible outcomes from your efforts from this historic investment that Congress has made over the last several years.

I look forward to your questions today and our ongoing conversations in the months and years ahead, as we continue to work with our elected officials and Federal agencies to advance knowledge,

discovery, and prosperity in Massachusetts and across the United States.

Thank you to the Committee, the United States Senate, and the entire Massachusetts congressional delegation for your continued support.

Chair WARREN. Thank you, Chancellor Chen.

Dr. Bourque.

**STATEMENT OF MARY BOURQUE, COEXECUTIVE DIRECTOR,
MASSACHUSETTS ASSOCIATION OF SCHOOL SUPERINTENDENTS**

Ms. BOURQUE. Yes. First of all, Senator Warren and Senator Markey, thank you for the invitation to speak to you this afternoon.

I want to commend you on choosing the term, “investments,” in the title and, therefore, the framing for this hearing. Investment is a term that implies a return or appreciation over time.

In education, our investment return is, quite simply, our students, the next generation, who are prepared with the knowledge and skills to be the future workforce and leaders of our communities, State, and Nation.

Investing in education is one of the most important ways we can strengthen our economy and ensure our global competitiveness. We are grateful for the Federal support to our schools throughout the 2-year pandemic and the multiyear recovery work that continues today.

School leaders were able to use the elementary and secondary school emergency relief funds authorized in three separate Federal laws, to ensure a holistic, multiyear approach to educating students during and beyond the pandemic.

In particular, the \$1.8 billion Massachusetts received from the American Rescue Plan ensured district leaders were able to use these funds to address the immediate needs of our students, and also plan through, an equity lens, for postpandemic transformation of how we do education and how we wrap our school district programs around both students and families.

Data collected this summer from AASA, of school district leaders in Massachusetts and around the country, found that the number one use of the America Rescue Funds was adding instructional time and programs. This was echoed by data collected by the Massachusetts Department of Elementary and Secondary Education, which found that addressing unfinished learning loss supporting special populations, such as our ELL, and special education students, improving facilities and air quality, and supporting the social/emotional and mental health needs of our students, were the primary areas that were invested.

In addition to ESSER funding, there are two very concrete areas of recent Federal investment that have propelled positive change. I want to highlight the two to you today: Educational technology and clean energy buses.

It is in the area of educational technology that transformational change, through an equity lens, is most noticeable. Prior to COVID-19, school districts across the Commonwealth were slowly moving forward with their technology plans. In most school dis-

tricts, students shared classroom sets of computers, laptops, or Chromebooks. In a very few, fortunate school districts, students were lucky enough to have a one-to-one capability, but students were not allowed to bring the Chromebooks or the laptops home. Districts did not have the money to institute a repair or replacement plan as is done with textbooks.

The digital inequality of those schools that had computers and those that did not, or only had a few to share among hundreds of students, and those families that had computers or digital resources for learning were there and those that did not. We knew that this was there. But we were comfortable, at the time, saying, we are working on it.

With COVID-19, the shift to online learning shined the light on educational inequities that had to be urgently addressed.

Through a greater investment in the E-Rate program, funded through the universal services fund, ESSER moneys, and Federal funds mentioned earlier, districts were able to purchase the digital devices, Chromebooks, and laptops, as well as hire technology support staff trained to support the teachers, students, and families in the use of the devices.

Second, the funds were used to address the access to Internet issues. And so the purchase of hotspot and community family affordability plans were implemented.

Third, as teachers changed the way they planned and executed lessons, they created daily lessons that required more connectivity, capacity, and reliability.

Federal funds helped with the installation of broadband Internet, which provided communities high-speed connectivity that was reliable and stable.

Our rural and urban areas, in particular, benefited from the increased technological access and opportunities to learn, but also highlighted longstanding inequities in who could and could not access the Internet. Students from low-income households or those without access to technology and Internet connectivity struggled to participate in distance learning, leading to disparities in educational opportunities.

As many school district leaders proudly express today, because of COVID-19, our school districts are one to one. For other school districts, they are getting there.

There is no going back, however, to the way teaching and learning was conducted prior to COVID-19. For us, as educational leaders, there is only going forward.

I want to thank Senator Markey for his longstanding advocacy for the E-Rate program.

So what does going forward look like? We build upon the resilient educational infrastructures initiated over the few years and we expand where needed. We continue to uncover where there may be digital access and connectivity disparities and seek to close them. We continue to be creative and innovate.

It is exciting to envision what the classroom of the future can look like, thanks to the investment in technology. We need to continue to invest in this work.

The second area I would like to highlight is the very real investment in our students' health. Federal funds, in many school dis-

tricts, were directed to implementing new or upgrading existing HVAC systems, resulting in improved air quality within our schools.

To address the air quality outside of school buildings, district leaders used a combination of Federal resources to begin to purchase or lease electric buses and charging stations.

It is here I want to thank Senator Warren for her work and her vision to provide clean school buses for our communities, most recently her work with the Environmental Protection Agency's clean bus program, which has been instrumental in bringing the benefits of electric buses to our communities.

The investment in clean buses is a value statement on so many levels. It demonstrates to students that their health is valued, the air quality of their community where they live is valued. We know diesel buses contribute to the air pollution which, in turn, contributes to respiratory problems, such as asthma in our children.

Our urban communities have been the most disproportionately impacted by the air pollution, with emissions from cars, public transit, trains, airports, all converging to create a clean air crisis for our families.

Helping these communities, in particular, sends a message of their value and the environmental justice we seek for them.

In addition to making a dent in air pollution, the zero-emission buses are quieter, thus, reducing noise pollution. And over time, we believe the buses, with charging stations, will be more cost effective and sustainable for our school districts.

Our district leaders wanted to share that they are grateful for Round I and are eagerly awaiting Round II, as they seek to replace their diesel buses with environmentally friendly, healthier transportation.

One of our district leaders shared that his school district and city did not have the money to take on this initiative. It would not have happened if it were not for these funds and their award.

Here, again, is an example of deep transformational change that has begun and must continue and will continue with your ongoing leadership. We can't go back when so much good has happened.

Chair WARREN. Yes.

Ms. BOURQUE. Thank you.

Chair WARREN. Thank you so much. That is a terrific statement. Thank you, Dr. Bourque.

So we have been talking about the importance of infrastructure. It is about traffic, it is about clean air, it is about clean water, it is about building a future, it is about our research. But it is also about jobs.

And I want to focus on that, for just a minute, because we haven't had as much conversation on it.

I was looking at the stats on the Boston Logan Airport renovation.

The Bipartisan Infrastructure Law set aside a billion dollars to improve airports around the country. Logan Airport received the largest grant of any major airport in the entire Nation. And it is being used and has been used to fund the work on Terminal E.

Mr. Antonellis, you are a labor leader here in Massachusetts. Tell me, who is carrying out the work at Logan to modernize Terminal E?

Mr. ANTONELLIS. Sure. The new renovations at Terminal E at Logan are hundreds of millions of dollars in transportation infrastructure investments. And I believe much of it, I think \$62 million, was provided by President Biden's Bipartisan Infrastructure Bill.

And union construction firms, including IBEW contractors and members, are still out there working. I know they had a ribbon cutting last week, but there is still work to do.

There was about 1,000 total construction jobs created on that one project, engineering and construction jobs.

Chair WARREN. 1,000 total construction jobs?

Mr. ANTONELLIS. Yes.

And about 150 to 200 electrical-specific telecommunications jobs created for IBEW men and women. In fact, my son is an IBEW apprentice, and he is an employee on that job. So it hits home for me, that job. I am very excited about the investments at the airport.

Chair WARREN. That is terrific. And not just 1,000 jobs, but 1,000 good union jobs.

Mr. ANTONELLIS. That's right.

Chair WARREN. That is terrific. And jobs that are being used for apprentices, as well.

Mr. ANTONELLIS. That's right.

Chair WARREN. That is terrific.

So when President Biden came to Boston to announce this investment, he said, "Logan is more than an airport. It is an economic engine."

Chancellor Chen, I want to ask you. You lead UMass Lowell, so this may seem like an odd question.

But is it important to the university, here in Lowell, that Boston has a world-class airport?

Ms. CHEN. Definitely. I would say two words: Nonstop flights.

We all know, having nonstop flights between Boston and San Francisco and L.A. and Seattle and, of course, DC and international, London, Paris, Tokyo, San Paulo, this enables our faculty, staff, and students to be connected to partners across the world and across the country.

And that is what enables us to be at the forefront of new discoveries and also attract companies to want to come here. Right? They think about where they are going to locate. Well, if they can take a quick flight from where they are currently to Massachusetts, it makes a huge difference in them thinking about where I do want to locate.

And we want them to be here in Massachusetts, working with our students, faculty, and staff.

Chair WARREN. Great. So airport is a great example. But airport is not the only example of jobs that have been funded through these new investments in infrastructure.

Mr. Antonellis, can you just name a few other major projects that your members are working on right now, that have benefited from Federal dollars?

Mr. ANTONELLIS. Sure. I know the MBTA gets a lot of bad headlines.

Chair WARREN. Yes, deservedly.

Mr. ANTONELLIS. But at the end of the day, the MBTA receives a lot of Federal dollars. It puts a lot of hardworking Massachusetts residents to work. And we would be lost without those jobs at the MBTA. Maintenance jobs and construction jobs.

And I know bus electrification, we have been talking about. Four major bus electrification projects are coming to the MBTA. One recently bid in Quincy, that we talked about, a massive project at the old Lowe's site. And then there is one coming in Cambridge, one in Jamaica Plain. And we are very excited about doing the work on bus electrification, as well as the City of Boston for the school buses, to electrify them.

Chair WARREN. I know. Look, I am aggravated with the T right now. So are a lot of people.

Mr. ANTONELLIS. Of course.

Chair WARREN. But this is how we make it better. And it is not going to get better on its own. It is only going to get better if we make the investment and we have good workers there, straightening this out. And I appreciate the work.

Mr. ANTONELLIS. We need safe, reliable, public transportation.

Chair WARREN. We need it.

Mr. ANTONELLIS. Desperately.

Chair WARREN. That is exactly right.

Another piece—and you picked up on this, Dr. Bourque—that is exciting about the investments in infrastructure, is helping electrify the local school bus fleets.

And last June, I sent a letter to the Massachusetts Association of School Superintendents—you may remember this—highlighting the benefits of electrifying the Commonwealth school bus fleet and encouraging members of your association to take full advantage of the EPA's newly announced \$5 billion investment in the clean school bus grants program.

And you got part way there, but I just want to give you a minute to say something more about it. Why do we need to care about green school buses? After all, kids can get delivered on those old diesel school buses.

Why does it matter so much?

Ms. BOURQUE. Air impacts everything. It seems very evident, but we have to really consider the fact that our students are breathing in toxins from the diesel fuel. And we know some from science, in terms of what the impact is on a young person's body, but they end up coming into the classroom and the cognitive brain function might be a little slow for a while. Certainly, the motivation might be impacted. The energy level that you want from a learner. And so, then it is that difficulty to engage in learning, to take academic risks.

And so most certainly, it is about wanting the best for our students and it begins with air.

Chair WARREN. I like that. I like that.

I also want to pick up, you made the point about access to computers and the kids having access. Very important. But I was thinking, as well, about the gaps in high speed Internet access.

The Commonwealth's highest income counties, more than 70 percent of residents have high speed Internet.

But out in Berkshire county, the number drops to 39 percent. Fewer than half of the residents in Franklin county and Hampshire county have access to broadband.

I think that is one of the reasons. Another exciting part of the Bipartisan Infrastructure Law and the American Rescue Plan is the massive investment in broadband, to finish, to get the broadband everywhere.

\$90 million dollars, the largest Federal investment in high speed Internet in our Nation's history.

So Dr. Bourque, you work with school superintendents across the Commonwealth. Can you just say a little bit more, you talked about the computers themselves, but what it means to have access to broadband?

Ms. BOURQUE. Sure. I think I would like to go back to the beginning of COVID and when we first started to have our students learning online.

And what ended up happening, the meetings would drop with their teacher. There would be interruptions. There would be the frozen screen, certainly, because there was not enough connectivity. There wasn't the capacity.

As teachers got better at planning lessons, they were also including videos or they were including hyperlinks. And the high speed capacity of many of our districts were not just able to handle that type of high speed capacity.

And then when you add 40 teachers doing it all at the same time, then that becomes another piece that you end up losing the connection.

Chair WARREN. Yes. That is actually a very good point.

This is part of reason that Senator Markey and I were very pleased to help bring \$175 million in Federal funding to Massachusetts, with the goal of bringing online, the parts of Massachusetts that don't have access to high speed Internet.

Right now, it appears that the funding that we were able to bring in is going to serve about 16,000 locations in our Commonwealth. And this means Massachusetts families, Massachusetts kids who will have access, and it matters.

So let me do a personal favorite, and that is Federal research.

Chancellor Chen, do you know, offhand, roughly, about how much Federal research funding UMass Lowell receives right now, to support all of your groundbreaking scientific advances?

Ms. CHEN. Yes. So of our \$111 million annual, are research, about 60 percent—sorry. About 54 percent, about \$60 million is Federal.

But the other piece of that is often industry and State. And it is not separate. One of the things that is unique is we talked a lot about matching dollars and commitment. So that Federal dollar piece is often matched by the industry piece and the State piece, that makes up that whole bucket of \$111 million a year.

Chair WARREN. Such an important point. It is the leverage point. I was thinking that we were, when talked about Logan.

Not all of the dollars came from the Federal Government. But if the Federal Government is not there to play, nobody comes to play.

Ms. CHEN. Right. Exactly.

Chair WARREN. It is having all of it that then creates the jobs, creates enough to support the research, creates enough that we can get the school buses across, whatever it is we need to do.

I want to talk about one piece of the funding that expanded as a result of the CHIPS and Science Act. So the CHIPS law allocated about \$1.6 billion to stand up regional hubs supporting the production of semiconductors and other microtechnologies.

And last month, we talked about this some, Massachusetts was awarded \$19.7 million in funding, to establish one of those regional hubs here. It is going to help Massachusetts lead the way with innovation in this cutting edge sector. And some of this work is going to take place right here at UMass Lowell.

So here is my question for you, Chancellor Chen.

How is the microelectronics work being done here at UMass Lowell, going to help grow our economy and strengthen our national security?

Ms. CHEN. Yes. Thank you for that. And thank you, Senator Warren and Senator Markey, for your support of that effort.

I think it speaks to one of the things that we talk about in terms of building ecosystem. There is an opportunity, because of the funding, bringing together UMass Lowell, other universities—MIT, Northeastern, we talked about—with companies in the area. It creates this ecosystem that has a virtuous cycle.

And one of the things here at Lowell, we have about 80 faculty, graduate students, and undergraduates that are involved in microelectronics research. The key, I think, for Massachusetts is that we don't have a big billion-dollar fab here. But Massachusetts has the skill and the talent to do the value-added piece.

How do you integrate the chip with sensors? How do you integrate it as part of the cloud? How do you do that edge device, edge computing? It is that building on top of the chip that is the specialty, I think, of this Commonwealth.

And a lot of that work is being done here at Raytheon, in printed electronics, in our center for advanced materials and soft materials. So a lot of the faculty and students are involved in that microelectronics research.

Chair WARREN. That is terrific.

Senator Markey, do you have some questions?

Senator MARKEY. Well, yes. Thank you.

Thanks so much for all that you do.

And we can see the future of the Commonwealth sitting right here. So we thank you for everything you are doing to make the 21st century greater than the 20th century. Thank you.

So Dr. Bourque, just coming back, just for a second, to the E-Rate and the emergency connectivity fund.

So when I was a boy, my father went to Lawrence High School. He got a good education. He was a milkman for the Hood Milk company. We live in Malden. But I can compete with the school superintendent's son in Malden, if I take my book bag home and I study as hard as he does.

Right? I didn't feel inferior. I felt, as my mother would say, "Eddie, if you don't study, we are going to donate your brain to

Harvard Medical School as a really unused human organ. It is up to you. Don't do it."

So I didn't feel, in any way, discouraged.

But as you are saying, when it comes to these digital technologies, there is a big gap. We don't have to worry, really, about Lexington or Newton or Brookline. But we do have to worry the kids in Chelsea and Lawrence and Lowell, in other communities who don't necessarily have universal access.

So we saw during, as you said, during the pandemic. It just shined a spotlight on that inequality, where 12 to 17 million children, mostly Black and Brown and immigrant, did not have the Internet at home. So they were at an incredible disadvantage.

Which is why I fought, along with Senator Warren, to add \$7 billion extra to the \$4 billion in the E-Rate program that I created in 1996, so that that \$11 billion would help you to create a program for Chromebooks, for hot spots, wi-fi, that kids could use.

So what is the lesson that we have to take from that, in terms of the thirst that kids have for it, regardless of their income and their aptitude for it, regardless of their race or country of origin, in terms of our long-term workforce development strategies for the Commonwealth and how ARPA helped you and how all of these other programs have to contribute to further advancing that goal?

Ms. BOURQUE. Oh, where do I start on this one?

You are absolutely correct. First of all, we are in a different world. And we were propelled into this world. The tipping point was COVID-19.

And so certainly where we had textbooks for all of us going to school, we now have a Chromebook or a laptop. And what that provides is 24-7 access to knowledge, to education, to problem solving skills, to connecting to other peers. The future and the landscape of what education could look like—we haven't talked about AI and virtual reality. Those can be good. There can be positives.

What Chancellor Chen was talking about in terms of the developments and the digital piece, what is the future? And if we isolate ourselves to just a few districts that can build that future pipeline of thought partners, of problem solvers, critical thinkers, then we are doing a disservice, not only to the districts where our children are not getting that access and opportunities, but we are also doing a disservice to our country.

Because we need the pipeline across the board. We need a workforce across the board, in digital technology and in innovation and creativity.

Senator MARKEY. How much did that Federal funding help?

Ms. BOURQUE. Oh, immensely. And I have retired, but I am working for the Association of School Superintendents. But for my successor, textbooks are the laptop. The laptop goes home.

There is practice. There is tutoring on Saturdays, if a child just wants to pick up the laptop and open it up at 9:00 a.m. There is just the ability for students to be curious and to go look up something. Many of us had a set of encyclopedia in our home growing up. Well, the laptop, the digital access is the encyclopedia nowadays.

Senator MARKEY. And with AI added on top it—and we have to be smart about how we are doing it, maybe.

Ms. BOURQUE. We have to wrestle with security and safety on behalf of our children, but absolutely. We should not fear it.

Senator MARKEY. Yes. And with maybe 60 languages spoken here in the schools of Lowell, with AI, every one of them might have it individualized with their home language, ability to be able to give them that kind of individualized attention that they need.

And then it comes to you, Mr. Antonellis. You are talking about your son, now, following in your footsteps.

Mr. ANTONELLIS. That's right.

Senator MARKEY. And there is going to be all of these thousands and thousands of jobs now, that require a higher skill set, I think, that you had to have.

Mr. ANTONELLIS. That's right.

Senator MARKEY. So what are those additional skills that your son now has, that you didn't have when you started, in terms of all of these digital technologies and the role that this system plays in it?

Mr. ANTONELLIS. It is not just my son. My daughter, too, went and got a college education. She got a business degree at UNH. And now she is an electrical apprentice. She is doing estimating and she is working with, no longer blueprints, but it is on a computer now. And she takes the computer home, and she learns how to estimate a job and count light fixtures and plugs along the floor, with a computer and with software that helps her lay out a job and bid a job for her contractor.

And the technology is amazing. The electrical industry is changing so fast, when it comes to building automation. And you can come in with a laptop and you can make the lights come on when someone enters the building and shut off as soon as they leave and programming for security systems, for card access, for cameras, stuff that didn't exist 20, 30 years ago, but now is prevalent in every single building that we enter. And it is all of that technology exists here.

Senator MARKEY. And these kids had to have additional skill sets in order to get into the game.

Mr. ANTONELLIS. Yes, exactly.

Senator MARKEY. You were mentioning, in terms of minority apprentices. Can you go back with that number one more time?

Mr. ANTONELLIS. Sure. Absolutely.

So started 7 years ago, my administration, and we made a deep dive into being purposeful on creating more opportunities for women and people of color, and certainly, because we are a Boston-based local union, the folks of Boston from the housing projects and the communities and the neighborhoods in Boston that typically wouldn't have access.

So we have increased our minority participation, women participation every single year. For the past 3 years straight, we have had 50-percent-plus of women and people of color in our apprenticeship program.

And kind of to give you a little snapshot, over the past several years, we have been retiring members with a racial makeup of like 95, 96 percent White males that are leaving the industry. And that is just a snapshot of where the industry was 35 and 40 years ago.

But the folks that are coming in and replacing those workers are 50 percent women and people of color, that are creating those jobs. And that is where we are going to look to to fill the gaps and fill the needs for the jobs of the future, all of these green jobs that are coming. We are going to need everybody, all hands on deck to help us. Women and people of color and underprivileged communications are helping us meet those goals.

Senator MARKEY. And you are essentially tied to Dr. Bourque, over here, in terms of the provision of the skill set for your workforce, as older, White male workers are retiring.

And then just finally, if I may, Chancellor Chen, can you talk about the importance of environmental justice funding in research, so that we can have the big picture seen quite clearly, in terms of what has to happen?

Ms. CHEN. Yes. And it is critical, environmental justice funding, in many ways. I will give two quick examples.

One is a project, I think, that you are very familiar with. NSF funded a project to develop the electronic tongue as a way to detect contamination in water. And the key part of that is that it is a hand-held, easy-to-use electro-chemical device that anybody can do.

So if we put these in the hands of who I like to call our citizen scientists. Right? A high school kid, an elderly person, somebody in their household to test their drinking water. It enables us to get a snapshot across the whole community, to understand if there is contamination.

And that is critical. I think the Governor mentioned before, about sewer overflows. These types of things with contaminated water hit environmental justice communities harder than others. And if we put in the hands of these people the ability to test their own water and for us to identify where there is problems, quickly, that is something that helps all communities.

And then the other piece I will mention is energy efficiency. Understanding how—similar thing—environmental justice communities often don't take the most advantage of some of the problems we have for energy savings. So this project is a way to understand and talk to those communities and get them involved and understand. How do you find that early adopter in an EJ community and get them to trust that this is something that is beneficial to them?

Those are just two great programs that have been sponsored by Federal funding, by your support, to help make this happen for all of our communities.

Senator MARKEY. Everyone talks about our need for more megawatts of electricity. But they don't talk enough about negawatts, because of energy efficiency. Because we are working smarter, not harder, using these digital skill sets to just reduce the amount of electricity that we use in the first place, and giving these young people the skill sets they can use in buildings and cars and all of their projects, just to make all of those projects more efficient.

So we thank all of you for your work.

And I would just like to note that there is an empty space here for Congresswoman Trahan. I'm sure she'd rather be here than where she is.

Ms. CHEN. I think she would rather be here than in DC holding the fort down.

Chair WARREN. That is a low bar.

Senator MARKEY. Thank you, Senator Warren.

Chair WARREN. That's right. So are you ready for me to wrap this up? We are good?

Senator MARKEY. Ready.

Chair WARREN. I just want to say thank you, again. We have talked today, a long day, about infrastructure, about what it means for jobs and the economy and our communities and resilience.

But this has also been a day about partnership. I have the best partner in the United States Senate. We are more than twice as strong.

Do the Power Rangers thing. Right?

We also have a great partner in our Governor and Lieutenant Governor, who are all-hands-on-deck and ready to go, and in our mayors, who want to be part of this.

But it is also about partnership with the people who have shown up as our witnesses. I am very grateful to you for being here, for talking about these issues that are so important to all of us. We have real opportunity here. And we can't—let me put it this way. We will do so much better if we keep strengthening these partnerships as we go forward.

So thank you again to UMass Lowell for hosting us. It has been terrific. And thank you to our witnesses.

Questions, for the record, are due 1 week from today, on Friday, October 27th. For our witnesses, you have 45 days to respond to any questions.

Thank you, again. With that, this hearing is adjourned.

[Whereupon, at 5:13 p.m., the hearing was adjourned.]

[Prepared statements supplied for the record follow:]

PREPARED STATEMENT OF CARLOS MONJE

UNDER SECRETARY OF TRANSPORTATION POLICY, DEPARTMENT OF TRANSPORTATION

OCTOBER 20, 2023

Chair Warren and Senator Markey, thank you for the opportunity to testify today and for your leadership and partnership as we work to build a stronger, safer transportation system.

As I speak to you today, the Department of Transportation (DOT) is close to wrapping up the second year of implementing the historic Bipartisan Infrastructure Law (BIL). We've been hard at work creating new programs and making critical investments in our Nation's infrastructure. To date, across the Administration we have announced over 38,000 projects across the country. Our transportation investments are making our roads safer for pedestrians, bicyclists, and drivers; making transit more affordable, reliable, and accessible; and reconnecting communities that have been divided by past transportation decisions. We're making sure that these new investments are not only resilient against extreme weather, but help combat the climate crisis. And these are not only investments in America's infrastructure, but also in its workforce, creating hundreds of thousands of good-paying jobs each year in manufacturing, construction, and transportation.

On behalf of Secretary Buttigieg, I'm honored to share with you today some of the ways in which the people of Massachusetts are benefiting from these investments, as well as other areas of the Department's work.

Safety is the Department's top priority and in 2022, we committed to an ultimate goal of achieving zero roadway deaths through our National Roadway Safety Strategy. I am pleased to begin by highlighting our safety investments in Massachusetts; after all, Massachusetts consistently ranks as one of the safest States in the Nation in terms of fatalities per miles traveled and pedestrian fatalities per capita. The Bipartisan Infrastructure Law greatly expanded the resources we're able to put toward roadway safety in the form of the Safe Streets and Roads for All (SS4A) program. To date, we've awarded more than \$30 million to 17 communities in Massachusetts. The SS4A program is helping 15 communities across the Commonwealth, including the Cities of Fitchburg, Pittsfield, Southbridge, Ware, and Worcester, to develop comprehensive roadway safety action plans. We've awarded \$9 million to Boston to deploy low-cost, high value safety improvements at intersections across the city. And in Springfield, we awarded \$15 million to improve safety for pedestrians and cyclists at 15 intersections and along 10 corridors that currently experience a disproportionately high number of fatal crashes. The SS4A program is just one example of how we can continue to work together to make one of the safest States in the Nation even safer.

DOT is also hard at work making sure that the transportation sector is central to tackling the climate crisis; as the biggest contributor to greenhouse gas emissions, transportation must also be a part of the solution. On this front, we've made significant investments in Massachusetts.

Most notably, our Federal Transit Administration (FTA) awarded nearly \$220 million the last 2 years under its BIL-funded Low- and No-Emission and Bus and Bus Facilities programs.

Through these awards, we're helping to replace diesel buses with electric and hybrid buses across the Commonwealth. In Fiscal Year 2022, Massachusetts received more than 10 percent of the total funding from this program, and was second only to California in terms of total funding received. These kinds of investments not only make transit agencies more reliable, but also give transit riders a quieter, more pleasant experience, and communities cleaner air. Moreover, they include efforts to prepare our transportation workforce for these newer technologies, including through apprenticeships, on-the-job training, and instructional training. A good example is the \$6.9 million award provided to the Lowell Regional Transit Authority (LRTA) in June to purchase hybrid-electric buses to replace older vehicles that have reached their useful life and to launch a workforce development program to provide on-the-job and instructional training for the maintenance and operation of hybrid electric vehicles.

As we make investments in the safety and climate impact of our transportation system, we're mindful that the benefits of transportation infrastructure projects must also be done equitably. The Department is actively addressing environmental justice and working to undo past harms through the Reconnecting Communities and the Rebuilding American Infrastructure with Sustainability and Equity (RAISE) programs. As part of the Biden administration's Justice 40 initiative in Massachusetts, the new Reconnecting Communities program is already helping the City of Boston assess the feasibility of reconnecting parts of Chinatown to downtown Boston

previously divided by the construction of Interstate 90 (the Mass Pike). Meanwhile, RAISE is funding improvements to transit infrastructure, bridges, and roads in disadvantaged communities in Springfield, Lynn, New Bedford, Brockton, and right here in Lowell, where we're funding the rehabilitation and preservation of four deficient bridges with improvements to pedestrian, bicycle, and transit accommodations.

Lastly, I want to touch on America's workforce and innovation as we look toward building for the future. Massachusetts received nearly \$6.5 million from DOT's new BIL-funded Strengthening Mobility and Revolutionizing Transportation (SMART) discretionary grant program. In Massachusetts, SMART is funding smart traffic signals in Brockton, planning for smart grids at the Cape Cod Gateway Airport and at MetroWest Regional Transit's headquarters, and improvements to rail safety on Cape Cod using unmanned aircraft systems and smart sensors.

I was also recently here alongside Governor Healey to cut the ribbon on a brand-new facility for DOT's Volpe Center, which will draw on some of the brightest minds to support the work across our Department. This new facility will provide the modern facilities needed to expand advanced transportation research, and house the next generation of the transportation workforce through internships, academic research partnerships, and mentoring programs.

Speaking of academic partnerships, we also recently named UMass Amherst as the lead of our New England University Transportation Center, alongside consortia members from Bunker Hill

Community College, Holyoke Community College, and MIT. We're excited to see how they can help us advance our transportation work particularly in both safety and equity.

In closing, at DOT we see Massachusetts as an example when it comes to demonstrating how transportation infrastructure can be safer, more climate-friendly, and a tool for building communities and encouraging innovation. But we're also encouraged by the Commonwealth's desire to go further to continue investing here in the years to come, to improve the lives of its residents and workers, to support the critical industries that reside here, and to present a model to communities across the Nation.

Thank you, and I look forward to your questions.

PREPARED STATEMENT OF KATHLEEN HOGAN

PRINCIPAL DEPUTY UNDER SECRETARY FOR INFRASTRUCTURE, DEPARTMENT OF ENERGY

OCTOBER 20, 2023

Introduction

Thank you, Chair Warren, for this opportunity to provide an update on the Department of Energy's (DOE or the Department) progress in implementing the Infrastructure Investment and Jobs Act, also known as the Bipartisan Infrastructure Law (BIL), and the Inflation Reduction Act (IRA).

These bills are truly historic investments in renewing American infrastructure for decades to come. We are together rebuilding American manufacturing and increasing American competitiveness. We are creating millions of lasting, good-paying jobs and helping communities across the country to tackle huge challenges and take advantage of opportunities. We are assisting communities in realizing the impacts of rapid energy technology transitions and ensuring that cities and towns have access to new energy technologies that can reduce families' and businesses' energy bills as quickly as they can be deployed.

We at the DOE feel a sense of urgency so that our fellow Americans in all parts of our country can benefit from these laws. We understand that we are entrusted with investments being made by our fellow taxpayers. By implementing the BIL and IRA, DOE will strive to lower energy costs for Americans, improve reliability and energy security, and ensure America is positioned to lead the world in manufacturing the energy technologies of the future.

Overview of BIL and IRA Energy Provisions

Through the BIL, Congress provided more than \$62 billion for programs under the purview of the Department of Energy. The BIL requires DOE to stand up 60 new programs—including 16 demonstration and 32 deployment programs—and expands funding for 12 existing research, development, demonstration, and deployment (RDD&D) programs. The BIL also provides funding for many programs authorized by the bipartisan Energy Act of 2020, including Long-Duration Energy Storage demonstrations, the Advanced Reactor Demonstration Program, carbon cap-

ture demonstration and pilot programs, industrial emissions demonstrations, and more.

In the IRA, Congress invested approximately \$35.5 billion in programs administered by the Department of Energy, including \$8.8 billion for the Home Energy Rebates Program, nearly \$6 billion for industrial decarbonization, and increased loan authority for our Loan Programs Office (LPO) to help bolster burgeoning American innovation and domestic energy production.

This longer-term, demonstration- and deployment-focused mandate given to the Department by Congress also reflects a departure from other infrastructure packages in recent history, like the American Recovery and Reinvestment Act, which were more focused on research and development initiatives. The impacts of these new BIL and IRA investments will touch every corner of the country through competitive grants, formula funding, rebates, and loan programs that are thoughtfully designed and diligently administered by DOE experts, including career civil servants. Awards and selections to negotiate awards are also made by career officials via a merit-based process, with program integrity at the top of mind.

Taken together, the BIL and IRA are projected to save American families between \$27 billion and \$38 billion on their electricity bills from 2022 to 2030, relative to a scenario without BIL and IRA. American businesses are also projected to save on their electricity bills, with a 13 to 15 percent projected reduction in commercial electricity spending in the same time period.

Progress in Implementation

While only a portion of BIL and IRA appropriations were or will be obligated in Fiscal Years 2022 and 2023, DOE has been working expeditiously to deliver the greatest impact from these historic packages. As of October 17, 2023, the Department has released a total of 111 funding opportunities worth more than \$72 billion in initial investments for BIL and IRA programs. We also conditionally awarded \$1.1 billion in credits for zero-emission nuclear energy generation, made available \$4.25 billion in formula funding to State and local governments and Tribal Nations for energy efficiency and other clean energy projects, and selected nearly \$3 billion in awards for battery material processing, manufacturing, and recycling for negotiation. While continuing to carry out important programs outside of the BIL and IRA's purviews, the Department has built new internal organizational structures and operations to best facilitate the effective and efficient implementation of these laws.

In February of this year, DOE celebrated the 1-year anniversary of our strategic departmental realignment, which created the new Under Secretary for Infrastructure and three new offices—the Grid Deployment Office, the Office of Manufacturing and Energy Supply Chains, and the Office of State and Community Energy Programs. This Under Secretariat also includes the BIL-created Office of Clean Energy Demonstrations, as well as mission-aligned program offices, like the Loan Programs Office (LPO), the Office of Cybersecurity, Energy Security, and Emergency Response, the Office of Indian Energy Policy and Programs, the Federal Energy Management Program, and the Power Marketing Administrations. This new structure helps maximize the efficacy of BIL and IRA programs and boosts DOE's ongoing work to reduce energy costs through low-cost clean energy resources, stimulate American manufacturing and industrial competitiveness and create jobs, increase equity and environmental justice, and support meeting ambitious climate goals.

Since its implementation, the strategic realignment has allowed the Department to be nimbler and more responsive in its deployment of BIL and IRA, and to meet the challenges of implementing these historic laws. In addition, these structural changes set DOE up for success in carrying out all of our missions—and to carry them forward for the coming years and decades. The energy transition, which is already well underway, creates a massive opportunity to lower energy costs for American families, boost American manufacturing competitiveness, and maximize community benefits of new energy projects, especially in disadvantaged communities and those that have historically relied on the fossil fuel industry.

Seizing this opportunity requires active engagement with the private sector and communities as we deploy and oversee this unprecedented level of Federal clean energy investment, including in some areas and types of activities that are new to the Department. Our strategic realignment optimizes the world-class expertise of our talented staff and maximizes our ability to bring in new talent and skillsets that will serve the American public for decades to come.

We have also partnered with the Department of Transportation to stand up the Joint Office of Energy and Transportation, which aligns resources and expertise across our two departments to reach the President's goal of deploying a robust network of electric vehicle chargers, zero-emission fueling infrastructure, and providing technical assistance for zero-emission transit and school buses.

Program and Initiative Highlights

Clean Energy Demonstrations

The Bipartisan Infrastructure Law directed DOE to establish the Office of Clean Energy Demonstrations, also known as OCED, which was officially stood up in December 2021. OCED's mission is to deliver clean energy demonstration projects at scale in partnership with the private sector to accelerate deployment, market adoption, and the equitable transition to a decarbonized energy system.

Over the past several months, OCED has made selections for the negotiation of awards of large-scale demonstration projects to further advance our progress in the clean energy transition, including up to \$325 million for 15 projects across 17 States and one Tribal Nation to accelerate the development of long-duration energy storage technologies; up to \$1.2 billion for the Nation's first direct air capture demonstrations in Texas and Louisiana; and, most recently, up to \$7 billion for 7 projects spanning across 16 States to establish Regional Clean Hydrogen Hubs—a once-in-a-generation opportunity to lay the foundation for the clean hydrogen future.

Building a Better Grid

Earlier this year, the Department celebrated the anniversary of the Building a Better Grid Initiative, which is enabled by the Bipartisan Infrastructure Law and administered by the Grid Deployment Office—one of the new offices established under the strategic realignment, tasked with ensuring the reliability and resilience of our electric grid. The focus of this initiative is to catalyze the nationwide development of new and upgraded high-capacity transmission lines and support investments to modernize the flexibility and resilience of the distribution system. These efforts will create a more resilient electric grid, which is essential to increasing energy reliability and resilience, giving more families and businesses access to lower-cost electricity and enabling the benefits of the huge amount of new clean energy coming online as we move toward our 2035 decarbonization goals.

The initiative encompasses the Grid Resilience State and Tribal Formula Grant program. To date, GDO has awarded 48 States, 49 Tribal entities, 3 territories, and the District of Columbia a combined total of more than \$748 million. In September 2023, more than \$9 million was awarded to the Commonwealth of Massachusetts. Under the administration of the Massachusetts Clean Energy Center (MassCEC), Massachusetts will hold a competitive selection process to identify and fund projects that can improve energy reliability and resilience while reducing the cost and number of outages for communities and underserved populations. MassCEC will also support clean energy and decarbonization solutions, including building electrification.

As part of this award and in line with the President's Justice 40 initiative, MassCEC has committed to advancing their and the Massachusetts Department of Energy Resources' equity, environmental, and energy justice priorities, as well as creating good-paying jobs with the free and fair choice to join a union.

Strengthening America's Supply Chains and Reshoring the Industrial Base

As part of the departmental realignment, DOE created the Office of Manufacturing and Energy Supply Chains (MESC), which is tasked with strengthening and securing manufacturing and energy supply chains needed to modernize our country's energy infrastructure to support a clean and just energy transition and maximize the use of materials and services made in America.

MESC administers the Industrial Assessment Centers (IAC) program, a collective of 37 universities across the country—including the University of Massachusetts Amherst—that conduct energy assessments for small- and medium-sized manufacturers to identify opportunities to improve productivity and competitiveness, reduce waste, and save energy. IACs train the next-generation of energy savvy engineers, more than 60 percent of which pursue energy-related careers upon graduation. The UMass Amherst is one of the longest-serving universities in the IAC program.

Through the BIL, DOE is expanding the IAC program to community colleges, trade schools, and union training programs to expand access to energy- and manufacturing-related career pathways while providing hands-on support to small- and medium-sized manufacturers. The BIL also invests in IAC Implementation Grants, which provides funding to small- and medium-sized manufacturers to help implement recommendations provided by IAC assessors.

Working With State and Community Partners To Drive Decarbonization

DOE's Office of State and Community Energy Programs, also known as SCEP, works with our partners at the State and local level to deploy clean energy resources through BIL and IRA resources, such as the Renew America's Schools Program, the Home Energy Rebates Program, and the Energy Efficiency and Conserva-

tion Block Grant Program, as well as existing programs that have been bolstered by the BIL, including the Weatherization Assistance Program and the State Energy Program.

The Bipartisan Infrastructure Law invested a tremendous \$3.5 billion into the Weatherization Assistance Program (WAP), which reduces energy costs for low-income households by increasing the energy efficiency of their homes, while ensuring their health and safety. Of this total, more than \$80 million was allocated to Massachusetts; the Commonwealth has received 50 percent of those funds to date.

Similarly, BIL invested \$500 million into the longstanding State Energy Program which assists States in meeting their energy objectives, through which Massachusetts is receiving \$7.7 million.

In June, SCEP announced selectees for the Renew America's Schools program, which will fund infrastructure upgrades at K-12 public school facilities while prioritizing high-need school communities. For example, Natick Public Schools in Natick, Massachusetts, will receive more than \$2 million in BIL funding to fully electrify Bennett-Hemenway Elementary School, while also adding an air-to-water heat pump, replacing aging rooftop units, and installing a state-of-the-art building automation system. As part of this project and in line with the President's Justice 40 initiative, Natick has committed to providing project-based training on building electrification to 20 disadvantaged students in partnership with the Keefe Tech Regional Vocational School's HVAC-R program.

Further, SCEP has announced awards to Massachusetts cities and towns through the BIL-funded Energy Efficiency and Conservation Block program totaling about \$1 million to date with funds for Boston and Littleton. These efforts seek to improve building efficiency and increase electric load flexibility. More awards will be coming at the local level as DOE addresses applications a rolling basis.

The IRA included \$8.8 billion in rebates for home energy efficiency and electrification projects. These home energy rebates will help American households save money on energy bills, upgrade to clean energy equipment and improve energy efficiency, and reduce indoor and outdoor air pollution. DOE estimates that these rebates will save households up to \$1 billion on energy bills each year and support more than 50,000 jobs. On July 27, DOE issued Home Energy Rebate Program Requirements and Application Instructions for States to receive their full allocation to establish their rebate programs.

Driving Renewable Energy RDD&D

The Bipartisan Infrastructure Law provided appropriations for several renewable power programs that were recently reauthorized under the Energy Act of 2020. These appropriations directed DOE's Office of Energy Efficiency and Renewable Energy (EERE) to conduct cutting-edge research, development, demonstration, and deployment (RDD&D) of renewable power technologies.

For example, in May 2023, DOE's Wind Energy Technology Office (WETO) announced a \$1.07 million BIL-funded Small Business Innovative Research (SBIR) award to Massachusetts-based Triton Systems, Inc., with which Triton Systems will continue development of a first-of-its-kind helical anchoring system with a unique subsea installation tool to help maximize the efficiency of anchoring offshore wind systems. With support from a previous SBIR award, Triton Systems analyzed mooring configurations, analyzed soil and rock on the ocean floor, refined their tool design, and conducted an offshore installation methodology assessment.

Conclusion

Thank you again for the invitation to provide testimony before you today on the historic impact of the Bipartisan Infrastructure Law and Inflation Reduction Act on our economy. These laws provide an unparalleled catalytic investment to our Nation's infrastructure and energy security, and the Department looks forward to continuing our work together in implementing them with efficiency and integrity.

PREPARED STATEMENT OF MAURA HEALEY

GOVERNOR, COMMONWEALTH OF MASSACHUSETTS

OCTOBER 20, 2023

Good afternoon Senator Warren and Senator Markey. It is a pleasure to be with you here in the historic and vibrant City of Lowell. I thank you for holding this Committee hearing in our shared home State of Massachusetts, and I welcome this opportunity to testify about the critical importance of Federal funding to our State's goals and future.

Massachusetts is a State of firsts: the first State constitution, public school, library, and park; we built the first lighthouse, railroad, and subway, and here in Lowell one of the first great centers of industry. We were the first to make health care universal and the first to say love is love, equally for all. I, along with Lt. Governor Kim Driscoll, and our entire Administration see this legacy as our obligation to lead today—in protecting the rights and wellbeing of our people and fearlessly tackling the biggest challenges our Nation and world are facing.

Since taking office in January, we have led the fight on climate change. We appointed the Nation's first cabinet-level Climate Chief and the State's first Undersecretary for Environmental Justice & Equity. We launched the Nation's first State Climate Bank dedicated to affordable housing. We extended our clean energy lead and issued the largest RFP for offshore wind energy in New England's history. We banned State purchase of single-use plastics, and launched the strongest biodiversity conversation program in the Nation.

We also have led the fight to lower costs for families, seniors, and businesses. Last month we signed into law the most generous, universal child and dependent tax credit in America. And this week we filed the Affordable Homes Act, which would be the biggest investment in housing affordability in our State's history.

We have led on education. Our first budget funded permanent free school meals, breakfast and lunch, for all public school students; and free community college for all students 25 and older. We have rallied to advance equitable access to higher education in the wake of a misguided Supreme Court decision on college admissions. We have defended reproductive rights and safety for our LGBTQ youth.

We are leading, but the challenges we face are generational in consequence and global in scale.

That's why your leadership in Congress, in partnership with the Biden-Harris administration, has been so inspiring and critical to our efforts. You have enacted some of the most ambitious investments in America's history, stamping this legislation with Massachusetts values, from Senator Warren's fight to lower prescription drug costs to Senator Markey's pioneering climate bank vision. The intent of these investments, and the requirements for States to secure them, are closely aligned with our vision, our policies, and our work here in Massachusetts. And our partnership with the Federal Government has the potential to make the deepest impact and set the highest standards for our country's progress.

Federal infrastructure funding will not only help Massachusetts make long-overdue repairs to our roads, rails, and bridges; it will allow us to create good, accessible jobs, and strengthen community and coastal resilience. That's why our applications for Cape Cod Bridge funding, and the Allston Multi-Modal Project, include commitments to advance the legislation's goals of high labor standards and pathways into good, middle-class careers for women and workers of color. Federal clean energy funding, through the Inflation Reduction Act, will not only help us achieve Net Zero Carbon by 2050, it will help us create green jobs, affordable housing, and environmental justice in our communities. We are using all of our planning resources, inside and outside Government, to match funding opportunities with our decarbonization goals. That includes our new Community Climate Bank, which will finance the decarbonization of our building sector while expanding affordable housing for our people. Yesterday we announced our application for \$250 million in clean energy "Solar for All" investments for up to 78,500 affordable homes from the EPA's Greenhouse Gas Reduction Fund, the largest emissions reduction initiative in U.S. history.

In addition: Federal funding for advanced manufacturing, through the CHIPS Act and more, will allow Massachusetts to not only lengthen our lead, but broaden access to good innovation economy jobs. We are working with industry to expand workforce development pathways, starting with historic investments in STEM education in our schools. Already, we won the Department of Defense competition under the CHIPS Act to host the Northeast Microelectronics Hub, with plans for workforce training in advanced manufacturing.

And, we have been named an Investor Catalyst Hub for ARPA-H, the National Institute of Health's medical innovation program for transforming health care—in part because of our proven commitment to health equity.

From the first days of our administration, competing for and winning Federal funding has been one of our highest priorities. We established a Federal Funds and Infrastructure Office, under Director Quentin Palfrey, to guide this work across our administration and rally our partners in local government, business, academia, and labor.

We are getting results, and we have the opportunity to do much more. What Federal funding means for Massachusetts is an economy that brings opportunity to all our residents, and solutions to our Nation and our world's toughest challenges. I

thank you once again for the opportunity to testify and look forward to continuing the conversation.

PREPARED STATEMENT OF LOU ANTONELLIS

BUSINESS MANAGER AND FINANCIAL SECRETARY, INTERNATIONAL BROTHERHOOD OF ELECTRICAL WORKERS

OCTOBER 20, 2023

Thank you, Senator Warren and Senator Markey. I appreciate the opportunity to be here today to discuss the incredible work IBEW members do, and the opportunities that new Federal infrastructure and clean energy funding has created for our members here in Massachusetts.

Thanks to the hard work of our Federal delegation, billions of dollars in Federal infrastructure and clean energy funding have poured into Massachusetts. And our members are already hard at work helping businesses, homeowners, and school districts in communities across the Commonwealth use that funding to develop and adapt the clean energy technology of the future.

- This year, the Boston Public Schools rolled out the first 20 of a fleet of electric buses that will number 700 by 2030. Those buses were made possible by \$7 million in Federal funds, and by the hard work of our Local 103 members who worked with the school district to design and install the infrastructure they need to electrify their bus fleet.
- Speaking of buses, the MBTA is also making progress on that front. With the help of IBEW members and Federal infrastructure dollars, we're standing up a new bus facility in Quincy—and by 2026, it'll be ready to host the MBTA's new electric bus fleet.
- Our members have helped residential buildings add electric vehicle charging systems into their parking infrastructure so residents can switch to electric vehicles without missing a beat.
- It's not just electric vehicles either—IBEW members have worked on solar module installation projects across the Commonwealth. And as EPA Solar for All grants start coming to communities in Massachusetts (thanks in part to Senator Warren's advocacy), we'll be ready to help homeowners take a big step towards zero emissions.

As Federal dollars continue to flow in and kickstart more and more projects, IBEW is going to be right at the heart of it. We're doing our part to ensure the electrical workforce we need is ready to hit the ground running. We've seen our membership grow by almost 2,500 in the past few years, and we plan to double that growth over the next 5 years so we can be prepared to meet the Commonwealth's clean energy goals. And we've made substantial and strategic investments in workforce development—to the tune of more than \$10 million—to create the talent pipelines we need to meet demand.

A key piece of our plan to do that is expanding and diversifying the electrical workforce. I'm proud to share that in our most recent apprenticeship class, more than 50 percent of participants were women and people of color. This was our most diverse apprenticeship class ever, and we plan to keep building on that progress. Our membership should reflect the diversity of our community and of the places where we do our work. This is critical for two reasons—it shows the world we're paying attention and we know where the future is headed. And even more importantly, it shows young women, people of color, and other folks who haven't traditionally seen themselves in electrical work, that these are good, union jobs with great pay and benefits, and that these jobs are here to stay. Thanks to the work of our administration and our elected officials, we're seeing unprecedented investments creating new and unique opportunities for IBEW members. We're committed to making sure everyone in the Commonwealth—families, businesses, local governments, and workers—reaps the benefits.

Thank you again for the opportunity to be here today. I look forward to discussing further how important Federal investments in infrastructure and clean energy are, have been, and will be good for Massachusetts, and good for its union workers.

PREPARED STATEMENT OF JULIE CHEN
 CHANCELLOR, UNIVERSITY OF MASSACHUSETTS LOWELL

OCTOBER 20, 2023

Chair Warren, Ranking Member Kennedy, Senator Markey, and distinguished Committee Members,

Thank you for the opportunity to testify today about the profound and transformative economic impact of Federal investments in Massachusetts. It's an honor to welcome you to Lowell, a city founded on innovation and entrepreneurship and transformed by the National Park Service's investment in sharing that history.

Federal investments—particularly through the Commonwealth's research universities—have played a pivotal role in spurring innovation and bolstering research and development (R&D) in the Commonwealth. At UMass Lowell, these projects hold the potential to:

- Convert greenhouse gases into clean-burning fuels;
- To target RNA molecules to aid in early disease detection;
- To ensure water quality in underserved communities;
- And to create jobs and economic growth as research is converted into technology—technology into businesses—and businesses into the cutting-edge industries of tomorrow.

For UMass Lowell and countless organizations in Massachusetts and across the country, it is Federal funding that creates bold ideas and innovative theories and transforms them into tangible technology and societal impact.

Federal Agencies like the National Science Foundation, the National Institutes of Health, the Environmental Protection Agency, and the Departments of Transportation, Energy, and Defense all play a critical role for Federal investment in the Commonwealth. Federal funds from these agencies invest in ideas that are:

- Using Inflation Reduction Act funds to create community-based energy efficiency programs to combat climate change and save residents of underserved communities needed money on monthly energy bills.
- Using CARES Act funds during the pandemic to enhance our medical manufacturing capacity, provide personal protective equipment, and create training opportunities.
- Using ARPA money via the Mass Tech Collaborative, to provide equitable access to high-speed internet and digital literacy to gateway cities and underserved communities in the Merrimack Valley.
- And using National Institutes of Health (NIH) funding to develop point-of-care technologies that target heart, lung, blood, and sleep disorders, especially in underserved populations.

These investments bolster economic development, create good paying jobs and high-tech opportunities for the State's workforce, provide professional and research experiences for students and also promote equity outcomes across health care, infrastructure and clean energy production.

Today UMass Lowell is actively working to accelerate this model of success on our East Campus. Through the redevelopment of underutilized land, the university will create a mixed-use district in downtown Lowell with R&D and industry collaboration at its core.

Co-location of faculty, researchers, students and industry, Government, and non-profit partners has been key to UMass Lowell's rapidly growing \$111 million dollar research enterprise. From start-ups to joint research centers with major corporations, our commitment to collaboration has attracted business partners through our shared research facilities, innovation hub business incubators and the Massachusetts Medical Device Development (M2D2) Center run jointly with UMass Chan Medical School. M2D2 was one of the first nine Johnson & Johnson life sciences innovation labs worldwide. And through Biomedical Advanced Research and Development Authority funding, M2D2 supported more than 80 companies who worked to develop life-saving solutions in response to the COVID-19 public health crisis.

This recognition by industry, coupled with critical Federal investments, have created clusters of expertise around technology and the health sciences and bio-tech industries.

I was proud to join UMass President Marty Meehan last November in an op-ed in the Boston Globe as part of a statewide push by industry, nonprofits and State agencies urging the Biden administration to locate the Advanced Research Projects Agency for Health (ARPA-H) in Massachusetts.

I was thrilled by Governor Healey's announcement last month that the State had succeeded. While the technical depth and breadth of our universities and industry representatives were no doubt key to the administration's choice, as important, I believe, is a history and culture of collaboration between Massachusetts legislators, organizations and researchers to translate goals and aspirations into results that help real people.

In fact, five days before the ARPA-H announcement, we witnessed a similar outcome. The Healey-Driscoll Administration announced Massachusetts would receive nearly \$20 million through the Federal CHIPS and Science Act to establish the Northeast Microelectronics Coalition Hub.

We are delighted to join with our Massachusetts industry and educational partners to help meet the Nation's microelectronics requirements, stimulate job creation, train the next generation of STEM workers, and build the region's advanced manufacturing and technology sectors.

UMass Lowell, the Commonwealth, and the country are already beginning to see the tangible outcomes from the historic investment Congress has made over the last several years. I look forward to your questions today and our ongoing conversations in the months and years ahead as we continue to work with elected officials and Federal agencies to advance knowledge, discovery and prosperity in Massachusetts and across the United States.

Thank you to the Committee, to the United States Senate and to the entire Massachusetts Congressional Delegation for your continued support and recognition of the significant impact of Federal investments in our great Commonwealth.

Thank you.

PREPARED STATEMENT OF MARY BOURQUE

COEXECUTIVE DIRECTOR, MASSACHUSETTS ASSOCIATION OF SCHOOL
SUPERINTENDENTS

OCTOBER 20, 2023

Senator Warren, Senator Markey, and Members of the Subcommittee on Economic Policy, thank you for the invitation to testify before you today on the positive impact Federal funds have made in our Massachusetts schools.

I am Dr. Mary Bourque, the Coexecutive Director of the Massachusetts Association of School Superintendents (M.A.S.S.) and former superintendent of the Chelsea Public Schools, an urban school district here in Massachusetts. I sit before you this afternoon representing the Massachusetts Association of School Superintendents (M.A.S.S.) which includes 276 superintendents, 254 assistant superintendents, and 24 Special Education Collaborative Executive Directors. MASS is the Massachusetts affiliate of AASA, The School Superintendents Association based in Alexandria, VA.

I want to commend you on choosing the term "investments" in the title and therefore the framing for this hearing. Investment is a term that implies a return or appreciation overtime. In education, our investment return is our students—the next generation—who are prepared with the knowledge and skills to be the future workforce and leaders of our communities, State, and Nation. And investing in our public schools is one of the greatest investments we can make as a country. As Kirabo Jackson of the Council of Economic Advisers (CEA) wrote recently when schools get more money, students tend to score better on tests and stay in schools longer. Investing in education is one of the most important ways we can strengthen our economy and ensure our global competitiveness.

We are grateful for the Federal support to our schools throughout the 2-year pandemic and the multiyear recovery work that continues. School leaders were able to use the Elementary and Secondary School Emergency Relief Funds authorized in three separate Federal laws to ensure a holistic, multiyear approach to educating students during and beyond the pandemic. In particular, the \$1.8 billion dollars MA received from the American Rescue Plan ensured district leaders were able to use these funds to address the immediate needs of our students, and also plan through an equity lens for a postpandemic transformation of how we do education and wrap our school district programs around both students and families.

Data collected this summer from AASA of school district leaders in Massachusetts and around the country found that the number one use of American Rescue Funds was adding instructional time and programming. This was echoed by data collected by the Massachusetts Department of Elementary and Secondary Education (MA DESE) which found that: addressing unfinished learning loss, supporting special populations and improving facilities and air quality, were the major ways in which districts invested their Federal resources.

In MA, school districts selected among evidence-based programs to support educators in implementing high-quality, aligned curriculum; to improve inclusive co-teaching practices for students with disabilities and English learners; and to expand the capacity of all staff to address the social-emotional learning (SEL) and mental health needs of students and families. Others invested in research-based early literacy programs in pre-kindergarten and early elementary grades, building and sustaining culturally responsive learning environments for students; and, acceleration academies and/or summer learning programs to support skill development and accelerate advanced learners.¹

In addition to the ESSER funding, there are two very concrete areas of recent Federal investment that has propelled positive change that I want to highlight to you today: educational technology and clean energy buses.

It is in the area of education technology that transformational change through an equity lens is the most noticeable. Prior to COVID-19, school districts across the Commonwealth were slowly moving forward with their technology plans. In most school districts students shared classroom sets of computers, laptops, or Chromebooks. In a very few, fortunate school districts, students were lucky enough to have a 1:1 capability, but students were not allowed to bring the Chromebook home. Districts did not have the money to institute a repair and replacement plan as is done with textbooks. The digital inequality—those schools that had computers and those that did not (or only had a few to share among hundreds of students) and those families that had computers or Chromebooks and those who did not was noticed. The disparities in digital resources for learning were there, but we were comfortable saying, “we are working on it.”

With COVID-19, the shift to online learning shined the light on educational inequalities that had to be urgently addressed. Through a greater investment in the E-Rate program funded through the Universal Services Fund, ESSER monies, and Federal funds mentioned earlier, districts were able to purchase the digital devices—Chromebooks and laptops; as well as hiring technology support staff trained to support the teachers, students, and families in the use of the devices. Second, the funds were used to address the access to internet issues and so the purchase of hotspots and community/family affordability plans were implemented. Third, as teachers changed the way they planned and executed lessons, they created daily lessons that required more connectivity capacity and reliability. Federal funds helped with the installation of Broadband internet which provided communities high speed connectivity that was reliable and stable.

Our rural and urban areas in particular benefited from the increased technological access and opportunities to learn, but also highlighted longstanding inequities in who could and could not access the internet. Students from low-income households or those without access to technology and internet connectivity struggled to participate in distance learning, leading to disparities in educational opportunities. As many school district leaders proudly express, because of COVID-19 our school district is 1:1; for others, they are getting there. There is no going back to the way teaching and learning was conducted.

For us, as educational leaders, there is no going back—only going forward. I want to pause to thank Senator Markey for his longstanding advocacy for the E-Rate program. We are excited to see orders from the FCC just this past week which would allow E-Rate to be used for wifi on buses. E-Rate is the bedrock of our connectivity in public schools and we are grateful for his championing of this program.

What does going forward look like? We build upon the resilient educational infrastructures initiated over the last few years and we expand where needed. We continue to uncover where there may be digital, access, and connectivity disparities and seek to close them. We continue to be creative and innovate—more online classes for low-enrolled courses; personalized learning opportunities for students; individual virtual tutoring; virtual workforce development experiences; virtual training modules for teachers and staff; social/emotional telehealth; learning multiple languages online and talking to peers in other countries; global field trips and virtual experiential learning; and, we have only begun to discuss the power and potential of using AI and virtual reality in education. It is exciting to envision what the classroom of the future can look like thanks to this investment in technology—we need to continue to invest in this work.

The second area I would like to highlight is the very real investment in our students' health. Federal funds in many school districts were directed to implementing new or upgrading existing HVAC systems, resulting in improved air quality within our schools.

¹ MA DESE, “Update on State Education Budget, ESSER, & SOA Spending”; Slide 15.

To address air quality outside our school buildings, district leaders used a combination of Federal resources to begin to purchase or lease electric buses and charging stations. It is here I want to thank Senator Warren for her work and vision to provide clean school buses to our communities. Most recently, her work with the Environmental Protection Agency's (EPA)—Clean Bus Program has been instrumental in bringing the benefits of electric buses to our communities. Five of our MA school districts have taken advantage of the rebate competition and awards: Fall River (11 buses), Bourne/Upper Cape Cod Regional Vocational Technical School District (1 bus), New Bedford (14 buses), west Springfield/Lower Pioneer Valley Educational Collaborative (25 buses), Lawrence (25 buses).²

The investment in clean buses is a value statement on so many levels. It demonstrates to students that their health is valued; the air quality of their community where they live is valued. We know diesel buses contribute to air pollution which in turn contributes to respiratory problems, such as asthma in our children. Our urban communities have been the most disproportionately impacted by air pollution with emissions from cars, public transit, trains, airports, all converging to create a clean air crisis for our families. Helping these communities in particular sends a message of their value and the environmental justice we seek for them. In addition to making a dent in air pollution, the zero emission buses are quieter thus reducing noise pollution; and overtime, we believe the buses with charging stations will be more cost-effective and sustainable for our school districts.

Our district leaders wanted to share that they are grateful for Round 1 and are eagerly awaiting Round 2 as they seek to replace their diesel buses with environmentally friendly, healthier transportation. One of our district leaders shared that his school district and city did not have the money to take on this initiative, "it would not have happened, if it were not for these funds and the award."

Here again is an example of a deep transformational change that has begun and must continue and will continue with your ongoing support.

We can't go back when so much good has begun.

I thank you for listening to me today.

² EPA News Releases, Oct. 26, 2022.