

THE BROOKINGS INSTITUTION

THE INFRASTRUCTURE JOBS OPPORTUNITY:
IMPROVING WATER INFRASTRUCTURE AND
PROMOTING A MORE INCLUSIVE ECONOMY

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Fireside Chat:

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Chair, Subcommittee on Water and Environment
U.S. House of Representatives

Panelists:

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P R O C E E D I N G S

MS. LIU: Great. Good morning. Welcome to Brookings. I am really looking forward to this morning's event and I am glad that you all can join us today.

Before we start, I wanted to ask a basic question. How many people in this room work in the water sector or represent the water sector? Wow. This is great. And I think this is, you know -- it's actually really important to put a face to this industry because of one of the things that Brookings' Metro and our team have been doing over the last couple of years, is try to make sure that the water sector is more visible. Especially in an environment where it's values and literally it's infrastructure is invisible.

Yeah, we all know how important water is and the water sector is to our daily lives, to our community's health and to our economic competitiveness. So, today we are going to explore the intersection of water with another priority, which is jobs and income.

So, here is the opportunity. On the water side, our infrastructure network including dams, water pipes, treatment facilities remain in dire need of repair and modernization including the need to integrate new technologies that will make the delivery of water more efficient and more high quality.

Water industry and utilities also need a workforce that can keep pace with the rising demands to construct, maintain, operate, and innovate in the sector. Now there are many great stats in the report that my colleagues, Joe Kane and Adie Tomer are releasing today and you are going to hear more from them soon.

Yet there are two stats that really kind of stood out for me. One is, there are a whopping 212 different water occupations in the labor market representing 1.7 million workers including folks here in the room. And two, an independent survey of water and waste water professionals call the 2016 state of our industry report found that the average respondent was 56 years old and 38 percent were 60 years or older pointing to the retirement cliff and lack of age and also racial and gender diversity in the sector.

Now on the labor market side, while the national unemployment rate has been very low, those top line statistics mask a lot of unevenness in the country. Too many households across the country still earn a median wage that is lower than it was 20 years ago. Black and Hispanic workers earn lower wages than white workers. So, progress by race remains very insufficient. And as my colleague, Martha Ross, recently pointed out there are many workers across our cities that want to work but have not been able to find a job and thus their labor market participation or interest is not captured in national unemployment statistics.

So, Adie and Joe's research and today's event is trying to identify an opportunity that brings and addresses both of these issues. The needs of the water industry and the needs of job seekers. And as the research shows water infrastructure jobs pay above average wages and are accessible to workers of all educational levels.

Yet more must be done to, to frankly educate young people about the opportunities in the water sector and train more people for such jobs again in a sector that is vital to every community and to our economy.

So, I want to take a moment to for us to thank the organizations that made this research possible. The Surdna Foundation, the Mott Foundation, and the Water Research Foundation. I also want to give our appreciation to our friends at the Water Agency Leaders Alliance for offering their invaluable insight and connecting our scholars to local leaders around the country. The site visits and the conversations they had with water infrastructure leaders and cities like San Francisco, Louisville, Camden, and other cities with the Alliance grounded this research and frankly made it better.

So, now to quickly preview today's event. In a few moments, we are going to hear from Joe Kane, the lead author of the report who will represent findings from this research. After that we are honored to hear from Congressman Garret Graves who hails from the state of Louisiana and serves as the Chairman of the House sub-committee on Water Resources and Environment. I also want to note that he chaired the State's Coastal

Protection and Restoration Authority which was created right after Hurricane Katrina and was an authority that I monitored very closely after the storm and that authority has done some important work to restore the wetlands and the longer term sustainability of the region.

We will conclude the event with a panel of leaders and researchers from across the country to discuss the challenges and opportunities within the water workforce.

Okay, so that is the extent of my knowledge of water issues. It is a drop in the bucket compared to that of -- I know, groan. I was told by my team to use a really bad water pun in my remarks. So, it's time now for me to get off the stage and welcome my colleague, Joe Kane. Thank you.

MR. KANE: Good morning everyone. Thank you, Amy for that introduction. And thank you all for being here this morning. I have been fortunate actually to connect with many of you already throughout the project and I am excited to keep the conversation going not only today but also in the months to come.

As Amy describes, this work informs a broader conversation on infrastructure investment and workforce development nationally. The two go hand-in-hand as you will hear from me and several other speakers today. And the timing could not be more important not only to repair our infrastructure but also make sure that we have skilled workers ready to fill all of these jobs. Building off many previous studies we have on the infrastructure workforce as whole, our new research on the water infrastructure workforce looks at identifying and strengthening long-term pathways to economic opportunity or to be more accurate, a long-term pipeline to opportunity -- I have to get the pun in there.

As you will see in here today, the water sector is emblematic of an enormous economic opportunity that infrastructure as a whole offers the country. This opportunity is not simply limited to creating a certain amount of jobs by investing in one given project but it's about hiring, training, and retaining skilled workers to construct, operate, and maintain our infrastructure for decades to come. And ideally, these efforts are

connected to the diverse communities served by utilities and other foundational infrastructure actors who you will hear from, in particular from our panel.

And that serves as a basis for our report that was just posted last week. If you haven't already, I encourage you to check it out on the Brookings website when you get the chance. You will find a lot more detail including regional specific data and a long list of actionable workforce strategies. And special shout out to many of my Metro colleagues including Anni Rice and Ranjitha Shivaram for helping with some of those visuals.

So, today though I am going to cover three main parts of the report. First, the background and methodology which will help provide some additional context; the findings themselves which look at employment, wages, education, and demographics; and finally, the implications recommendations following from this analysis which I think will serve as a good segue to the rest of our speakers.

So, as we turn to the background, I think it helps to start with a look not just at the water workforce challenge but the water workforce opportunity. As US economy continues to grow, many communities are struggling to translate this growth into more equitable and inclusive opportunities for their residence. Persistent wage stagnation, income inequality, joblessness all remain pressing concerns across the country. Meanwhile many of the country's water infrastructure assets, as we all know, are in urgent need of repair or restoration.

However, investing in infrastructure represents one of the timeliest ways for the country to support long lasting pathways to economic opportunity for all workers across all skill levels across all regions. Naturally, this all starts with the question of who even are water workers. In short, the water workforce captures the wide range of workers who are directly involved in the construction, operation, design, and governance of the countries various water infrastructure systems. And I say water infrastructure as a short hand to capture all the drinking water, waste water, storm water, and green infrastructure facilities throughout the country which are crucially not just limited to utilities which you will see

reflected in some of these following slides.

So, in other words, the water sector captures a vast array of industries and establishments from engineering and design firms to material suppliers and contractors underscoring the need to consider a broad suite of employment opportunities in utilities and beyond. And by doing so, we are able to find specific occupations filled by individual workers allowing for a rich analysis informed by BOS data and other metrics.

For example, whether employed as plumbers and pipe fitters, carpenters and welders, or as managers and analysts, water workers maintain the vast spectrum of water infrastructure that enters the space of our everyday lives. And they carry out a number of different activities as a result whether installing, calibrating, and overseeing utility equipment, drafting plans, inspecting pipes for repairing, wiring, and buildings, or managing analyzing and supporting operations. As such these workers embody many of the skilled trades but also are involved in a variety of administrative, technical, and management positions too.

So in short, water workers span multiple industries across the country and utilities are not alone in hiring, training, and retaining these workers to oversee all the various infrastructure projects and facilities found across the sector. Rather a wide assortment of employers, community partners, and national and state level actors, each have roles to play in water workforce development. To provide drinking water, treat waste water, manage storm water, and balance other programmatic responsibilities, utilities depend on a skilled workforce. We know that utilities can vary markedly in the scale of their operations and workforce demands but they still obviously assume a lead role onboarding and ultimately preparing workers to navigate long-term careers.

Other water related employers including engineering firms, construction companies and so on are also actively involved in look out for workers to carry out specific water projects and activities. And, of course, there are a vast assortment of community partners that educate, train, and assist workers interested in water careers. These include

educational institutions, workforce development boards, unions and labor groups and of course, a number of community-based organizations and non-profit groups that ultimately provide the job readiness programs, transition services, and other channels of support to workers.

Finally, since we are in Washington, I have to mention this, there are several national actors too that are involved in water workforce development as we all know from EPA to Department of Labor and many of you are in the room today; to industry associations, to environmental coalitions, to State Departments of Education, the list goes on.

So, as we chart the actual findings, there are four total that I point to in the report and want to note today. First, in 2016, it's just how many workers -- as Amy described just a minute ago -- how many workers are involved in the water sector? 1.7 million and then just the range of different positions they fill. 212 different occupations according to our analysis. Which, as you will see, span a variety of industries and regions across the country.

Again, water utilities represent one of the biggest employers in the water sector but multiple other industries are crucial to consider as well. You can see here, water utilities employed about 298,000 workers in 2016, representing about 17.7 percent of the total water workforce. So, in other words, utilities are part of a complex economic sector, filled by a variety of other firms and establishments looking for skilled talent.

I do want to point out though, it's important to emphasize the utilities play a foundational role within the sector since utilities control some of the most critical public infrastructure assets, as we know, in need of long-term operation and maintenance. And crucially, they are often located in some of the most disadvantaged communities nationally. They represent major anchor institutions in many ways. And the report digs into this point more which I encourage you to check out but I know our panel will probably dig into this issue too.

Collectively, the water workforce fills 212 different occupations and carries out an enormous range of activities. These are just a couple of examples here for you to just get a sense of some of these occupations but plumbers ranks as the largest water occupation overall employing 324,500 workers or almost 20 percent of all water workers nationally. Operating engineers employ nearly 80,000 workers nationally. And then in addition to the position from a skilled trades though, there are thousands of workers involved in administration, finance, and management including as you can see here, over 47,000 office clerks alone.

Perhaps most importantly though, water workers are not isolated to only a few areas across the country but are employed everywhere speaking to their enormous geographic reach in urban areas and rural areas. For instance, they consistently represent one to two percent of total employment in most of the country's metro areas. This map shows the country's 100 largest metro areas where there are especially important job hubs for water workers employing 1.1 million water workers by themselves or almost 65 percent of the national total.

Not surprisingly, they are led by places like New York and Los Angeles, just big labor markets overall. But also interestingly markets like New Orleans and Baton Rouge which I imagine we will hear more from Congressman Graves about in a few minutes.

So, as we turn to finding 2, we also see that water occupations not only tend to pay more on average compared to all occupations nationally but they also tend to offer more equitable wages. In particular, they pay up to 50 percent more to workers at lower ends of the income scale. So, on average, as you can see here, water workers earn higher wages compared to all workers nationally. These all include higher paying occupations overall such as lawyers, hydrologists, and general operations managers but also span a variety of other technical and financial position.

But I really want to emphasize here, if you look at the 10th and the 15th

percentile, these wage premiums continue to many workers at all types of wages levels. In particular those workers that are just beginning their careers. So, as you can see here, water workers are an hourly wages of about 14 dollars and 17 dollars an hour. At those percentiles compared to about 9 dollars an hour and 11 dollars an hour for all workers across all occupations nationally. In total, workers across a 180 of the 212 water occupations are more than 1.5 million earn higher wages of both of these percentiles. And as you will see in a second, many of these equitable wages go into occupations that have lower levels of educational attainment which is a crucial consideration too.

So, furthermore, these equitable wages reach all types of areas nationally. You can just see here two examples from Minneapolis to San Jose, water workers can earn as much as 9 dollars more per hour, just the 10th percentile. And while several other factors such as cost of living need to be taken into account when comparing these differences across different regions, clearly water workers are gaining access to a variety of well-paying employment opportunities across the country.

As I just briefly mentioned, many water workers have less formal education while earning competitive wages which finding 3 describes in more depth. In fact, 53 percent only have a high school diploma or less. Put another way, while 32.5 percent of all workers across all occupations nationally have a high school diploma or less. A majority of water workers fall into this category. Speaking to the lower formal educational barriers to entry. These include carpenters, welders, septic tank servicers, and sewer pipe cleaners to name only a few.

It's important to note though that there are still many highly educated water workers as well. While only 14.9 percent of them hold a bachelor's degree or higher. Landscape architects, environmental engineers, computer systems managers, and others often have higher educational credentials and boast higher wages overall.

Beyond education, what's important to note is that nearly all water workers tend to require some related work experience and on-the-job training which highlight the

need for applied learning opportunities. For example, 78 percent of water workers need at least one year of related experience and that doesn't begin until they get into some larger occupations like water treatment operators that tend to need two to four years of experience. On top of this, almost 750,000 water workers or 45 percent of them need at least one year of on-the-job training. So, in turn, as you would expect, many water workers often need familiarity with enormous range of tools and technologies as part of their jobs and it's not just about formal education but actually applied learning on the job.

Finally, water workers have higher levels of knowledge in a variety of different content areas. Speaking to the wide of activities they perform and the numerous transferable skill sets they develop over time in design, building and construction, stem and so on. What I want to point out here though is that water workers possess higher levels of knowledge in many of the same 11 content areas that other infrastructure workers do who are employed in transportation, energy, and related industries. This is a crucial consideration for employers and other workforce professionals when trying to find and develop more skilled workers nationally. In other words, they should not just be looking at the water sector alone but should be looking across the entire infrastructure sector.

Which brings us to the last finding. Water workers tend to be older and lack diversity in certain occupations. As many previous studies have shown, thousands of water workers are aging and expected to retire from their positions in years to come. This is just one example from one occupation, right, water treatment operators. There are more than 115,000 of them nationally. Tend to be 46 years old at the median, that's more than 4 years older than the national median.

But the challenge is not simply limited to an older workforce. In particular, there is a lack of younger talent in these jobs. So, just 10.2 percent of all water workers are under the age of 24 compared to a 12.5 percent of all workers nationally. So, this is a crucial consideration when we think of the replacement needs and transfers happening not only for the next decade but the decades to come for this workforce.

The water industry is also predominantly male who represent 85 percent of the sectors' employment which I don't think is too much of a surprise when you think of the lot of skilled trades positions here. Women make up a majority of water workers in certain administrative positions but clearly, there is a lack of representation in many types of jobs across the sector when we think of mechanics, electricians, pipe layers, and others.

In addition, there is a lack of racial diversity across the sector in specific occupations. So, while near two-thirds of the water workforce is white, similar to the ratio found across all occupations nationally, Black and Asian workers in particular only make up about a 12 percent of the water workforce compared to 18 percent of those employed in all occupations nationally. The Hispanic share, as you can see, is actually exceeding the national average across all occupations. But this is primarily due to their concentration in much construction related jobs. People of color, in particular, tend to be underrepresented in higher paying occupations involved in engineering or management.

So in this way, the water sector offers a variety of pathways to more inclusive employment outcomes across a broad range of industries and occupations, across all types of markets, or offering competitive wages with lower educational barriers to entry. However there are several challenges too. The water sector is struggling to attract and hold on to skilled talent, equipping workers with needed skills and credentials is not always easy. And even those workers who are eligible and interested in water work cannot always navigate an inflexible time consuming hiring process to progress their careers.

I won't go into each of these in great depth but I will say that in addition to an extensive literature review, my colleagues and I conducted three site visits, as Amy mentioned, to California's Bay area, to Louisville, Kentucky and Camden, New Jersey along with an expert table in Washington, D.C. to look at clarifying these barriers across different regions throughout the country. So, for instance, a lack of public visibility combined with declines in career and technical education has reduced interest and experience among prospective workers who could fill water related positions.

Amy mentioned that one survey but we know there is a silver tide of retirements for many of these workers entered the sector and, sort of, the hiring boom of the 70s, right, following the Clean Water Act passage and so on. And right now, right, we are seeing that many qualified workers in the sector are eligible for retirement. In some cases, up to 50 percent for some utilities.

A combination of hard skills and soft skills are essential for water workers to carry out their jobs. However not all workers are gaining the needed education, experience or competency in these skills. And in particular, when it comes to the portability of credentials across not only different employers but across different states, it's a huge challenge not just in the water sector but in the infrastructure sector as a whole.

And even when students and other prospective workers demonstrate an interest in water careers pursuing the education and gained relevant experience, there can still be challenges in hiring them and providing long-term growth opportunities. For example, depending on the particular region, many prospective workers, young and old, may lack job readiness, may remain out of work due to a criminal past, or may present a non-traditional background just in general which the employers may not have the time, resources, or programmatic flexibility to handle. Again this is just a sample but I will say this, given the highly localized nature of water operations, capital planning needs and labor demands, there are no one-size-fits-all strategies to address all of these recruitment challenges which often spill over into the hiring process and the long-term retention of workers as they look to not simply fill a job but what I call a career in the sector.

So in many ways, addressing the countries water workforce needs represents an aspirational moment where continued planning helps but ultimately faster implementation is essential to drive new solutions. And to accomplish that, there needs to be a new water workforce playbook to accelerate thinking and action. Again no single strategy or individual actor is going to lead these efforts and some issues will be costlier and take longer to address. Rather than continually reflecting on what needs to be done, having a consistent and discreet

list of action items and help utilities, other water employers, community partners, and national and state leaders begin to prioritize and launch solutions.

You will see there are three parts of this playbook but these strategies are far from comprehensive. They are really more intended to serve as a guide for all types of communities and leaders to further customize depending on their specific needs and priorities. Some places might already be doing these actions, while others may have never considered them before. And I am sure we will hear more about this on the panel in particular.

So, to run through each of these. First, utilities and other water employers need to empower staff, adjust existing procedures, and pilot new efforts in support of the new water workforce. Locally driven solutions, I think, and we can say this through all of Brookings Metro work, I think are crucial first and foremost of high workers achieve the needed skills and identify the available pathways to secure greater opportunity. And these actions naturally start at the source where utilities and other employers needs to ultimately hire, train, and retain workers for themselves. But they should be a standard bearer in my view for the entire sector. Through a variety of internal programmatic changes, they can heighten awareness of the water workforce opportunity and further prioritize action around faster hiring, more flexible training, and more predictable retention.

So, this leads to many of the action items you can see here. I won't go into all of them because it will take away too much time but I will just go through a couple of them that I think are relevant to consider. So, you know, conducting more extensive public outreach and hiring a more diverse set of prospective workers, I think, requires a long-term commitment to balancing infrastructure and facility budgets with ultimately the workforce demands of the employer. So, succession planning is crucial in this respect but so is a more detailed accounting and measurement of labor demands which utilities like the San Francisco Public Utilities Commission are pioneering in conjunction with other Bay Area utilities as part of an effort known as Bay Work which I highly recommend you check out, if you haven't already.

Likewise, it is critical that prospective workers including other students and

non-traditional candidates like veterans, for example, have flexible opportunities to become familiar with the work and the types of opportunities available in the water sector. To do so, employers should design and launch new bridge programs including short term and immersive experiences, that we like to call boot camps, provide ways for younger workers and other non-traditional workers to explore water careers, and gain that needed experience. So, through its Green Jobs summer ambassadors program, for example, Camden has sought to create a quick way to introduce high school students to green and water related careers which I am sure Andy on the panel will bring up.

So second, a broad range of employers and community partners need to hold consistent dialogues, pool resources, and develop platforms focused on water workers. Many localities and utilities are driving, right, new workforce solutions but there needs to be continued dialogue and shared learning via stronger community partnerships. In other words, to reach more prospective workers, all types of community partners and employers, not just utilities, need to sit at the same table. Educational institutions, workforce development boards, unions, and a range of organizations all have a role to play here and it's critical for communities to keep stretching the tent to capture more partners and act more collaboratively. And without this coordinated leadership and action, you know, in my view, I think it will be difficult to achieve scale across a sector that can be highly fragmented and localized in its operations.

So, again, I won't go through all of these but, you know, the creation of new community platforms to encourage additional regional collaboration, planning, and action needs to be the norm, not the exception. As just one example, having a specific point of contact or a regional organization to coordinate these actions helps, but so does having a clear space and opportunity to gather together in a public facing way. Holding an annual water summit or meet and greet for prospective workers, employers, and community partners can connect with one another regionally would mark a step in the right direction which the Louisville Metropolitan Sewer District has done through its annual 'Can you dig it' event, which

just has an awesome name too.

In addition, similar to regional efforts already under way from manufacturing and healthcare are led by workforce development boards, there should be an effort focused on infrastructure and the skilled trades as you can see in the academy concept referenced. D.C. Water, for instance, is working with several other employers regionally as part of a newly launched D.C. Infrastructure Academy, which I am sure some of you have heard of, a new platform that is supporting more portable infrastructure education, training, and credentials.

And finally, national and state leaders need to provide clear technical guidance, more robust programmatic support, and targeted investments in water workforce development. So, I somewhat intentionally left this last, right. Kind of building up from the bottom-up. So, utilities, employers cannot act alone when addressing their workforce demands and broader regional collaborations are not going to solve all these issues either. National and state leaders need to provide greater capacity and support for all of these locally driven efforts. Also, Federal agencies including EPA, DOL, USDA, the VA, and other are already playing their part in related workforce development programs. And several national groups including water industry associations and others are remaining active in this space.

State level groups too including labor and education departments must also remain closely attuned to water workforce needs. However, many of these actors need to provide improved technical and programmatic assistance and in some cases, I think, targeted additional investments and training and skills development would be helpful.

So, the action items listed here aim to make progress on that front. Just a couple examples to go through. So, you know, first many utilities and workforce development groups have expressed a frustration, I think, at the lack of consistent or comprehensive information concerning best practices in water workforce development or, as I would like to say, a menu of options and particularly struggle to identify the common ingredients that make this menu possible. So, in other words, what specific actionable steps can all types of places follow to get started?

So, national leaders, in my view, are strategically positioned to bring greater consistency and direction to the water workforce including certain dialogues, considering reforms to certification programs, and forming templates ultimately for future action. We are already seeing this through the National Green Infrastructure Certification Program, through WEF, and several other partner organizations, and then of course, the National Rural Water Associations Water Pro apprenticeship program. So, this is an issue not just touching urban areas but rural areas too.

So similarly, Federal leaders should make it easier for utilities and other eligible entities to use funding in more nimble, flexible ways to support workforce development. Indeed offering additional flexible support for smaller utilities and jurisdictions would be particularly helpful in this way. And helping support more nascent innovative training programs such as the Water Boot Camp idea before, I think, will be welcomed even beyond the existing programs that could use additional support. So, we have seen this right through the State Revolving Funds, for example, but also those focused on apprenticeships and others that I know are currently up for debate in Congress.

So, in other words, there needs to be an acknowledgement of the varying scale of the water workforce challenge, opportunity and response which should be a central concern at a national level, not just a regional level. So, with that I think I may have -- take a question. Yeah. That's what I got. So, any questions, I am happy to take them. Thank you.

AUDIENCE: Good morning. Thank you very much. Congratulations on the report. The presentation was phenomenal but I am old enough to find even more phenomenal that you went all the way through a presentation on water and infrastructure and jobs and never said the word 'union'. And I don't know --

MR. KANE: I may have did, very quickly though. I was trying to get through a lot.

AUDIENCE: I am from New York city and I think you can go through every other municipal concentration of the jobs you are talking about and each and every one of

them is very closely managed by very strict unions who control who gets hired and who doesn't and is probably a big part of the reason your gender numbers are the way they are and your diversity numbers are the way they are and your pay scale numbers are the way they are and who is a clerk and who is not is the way they are. So, that's one question and another quick question is, I just wanted to know, are Department of Interior, Army Corps of Engineers, those sort of jobs included in there?

MR. KANE: Yeah. So, the first one, absolutely. I think I said it very probably in one second. But it should have been more than that. So yes, absolutely unions and labor groups are central to these conversations. They are probably, right, affecting some of the data that we are seeing. It's hard to isolate, right, those affects, just given the limitations at least in public data sources that, at least, we used for this report. It's certainly an area of interest, I know, for myself and colleagues, right, looking into this issue, as we, right, keep getting deeper, diving deeper, whatever you want to call it.

So, yes. And I think, you know, on the site visits in particular talking to many of the utility folks and other workforce leaders, right, this is an issue, right, that in many cases, right, and I didn't get into the example in the, sort of, the utility, sort of, employer-driven part but job classifications even, for example, right, job classifications were developed, in some cases, 20-30 years ago, right, often hand-in-hand with labor groups. For a good reason, right. To provide an opportunity for workers to learn on the job, right, and so on.

But perhaps, right, as we think of changing technologies, perhaps as we think of changing skill sets, if we are trying to reach more workers, maybe there needs to be some revisiting, right, to have we are defining those jobs, defining, sort of, the pathways by which workers actually accessing these opportunities. So, yeah, I mean, I do know about that but I think you are right.

The second bit on water resources, kind of, and broader, sort of, wetlands coastal restorations and those sorts of jobs and being --

AUDIENCE: Boats and leggings and dam-ing and (inaudible)

MR. KANE: -- boats. Right. So, sort of the same reason. It's hard to isolate that in the data. But, you know, without going through the whole methodology, which is way too long, I encourage you to check out the report where we do have a breakdown for each of the individual industries that we used to ultimately classify the occupations and so, within those industries, right, we do include some of those activities.

AUDIENCE: So, we are here in Washington. So, what would be a good central place for the Federal government to have a reaction to these policy suggestions you have? Is this something that should happen in Commerce, Labor, EPA? Is there a natural home to, kind of, address these core issues you have identified?

MR. KANE: Yeah. It's a great point. So, it was, kind of, another point that I glossed over among many of those icons you saw in that national sort of bit but you are right. There are many different agencies that I think have a role to play here. I think there are many folks on the Hill that have a role to play here. Bipartisan, right, it's just not, you know, I think infrastructure investment and workforce development is something we can all, kind of, agree on I would hope. But, you know, the problem is, I think, coalescing and, right, kind of, aggregating that action into a cohesive hole so actually something can get done.

So, we are not just continually talking, right, spinning our wheels, right, just talking about what should be done but actually doing something. And I think we are already seeing this to some extent, right, in some of these agencies, right, when we are talking about apprenticeships, we are talking about, right, even on the Hill, right, I know apprenticeships have come up there as well.

But one idea that I think will be powerful even as -- and it doesn't take a lot of money, really right, is having even consistent points of contact across these agencies, right. So, I know, in EPA, right, there is an Office of Drinking Water, there is Office of Clean Water, right, and very much, sort of, sliced pies, sort of, the regulatory, sort of, framework we have in place. But I know that that many of those offices are already thinking about this, of trying to assign specific program staff to think about these issues. The VA I know has done this in the

past. USDA, right, as we are thinking of rural issues, is thinking about this.

So, is there a way that we can collect, right, these Federal actions together?

One idea we had is creating a water workforce council, right. So, I want to say it's not just Federal. I think it's crucial that they are national organizations here too. So, for just, right, looking at water, I think we are missing a big part of the equation in terms of workforce groups, skills coalitions. And then even perhaps who knows other infrastructure sectors too I think that should be at the table.

One more. I can hear you.

AUDIENCE: I am curious. Does the 1.7 million number include (inaudible), I guess so to speak, folks who are manufacturing the pipes or all the infrastructure, I suppose in the water group.

MR. KANE: Right, so, you know, without bearing every one and other reports we have done. So, this report actually builds off a lot of methodology that we used for other infrastructure workforce reports. And so, when we say it's literally the construction, operation, maintenance, design, right, that kind of -- not to say those manufacturing workers aren't important, they are.

But, you know, at a point, you do need to bound, in my opinion -- especially when I think it comes to the infrastructure conversation, right, of, you know, the country has obviously certain issues in terms of construction and new infrastructure but we are at a point of a lot of operation, maintenance, restoration. And so, I think emphasizing that part, right, so it's not just, you know, the creation of, sort of, the shiny new object and right, the ribbon cutting ceremony and then, kind of, we create so many jobs from that, right.

But actually focusing on this longer term conversation, right. So, it's not multiplier effects. It's not direct, indirect, induced jobs right. But it's actually talking about the workers themselves, what pathways they need to access opportunity here. So, I think that's why I think we focus probably at least, in our definition, more on the operation and maintenance aspect but for sure, I mean, I think manufacturing is certainly relevant, I know,

even in like transportation, right, that's something we consider.

One more? Keep adding on.

AUDIENCE: Yeah, thank you. I see you are addressing the skill trades but at the Water Research Foundation, we have also looked at skills of the future where we have identified what the utility of the future is going to look like --

MR. KANE: Yeah.

AUDIENCE: -- and steps we have taken in addition to a report we did last year, we are going to hold some workshops later in the year, where we are going to look at industry water sector strategic workforce development planning and employee value propositions. So, that's taking next step, especially value proposition where we are going to be looking at what the utility offers their employees and what the employees can expect in return. So, that's where we are headed.

MR. KANE: Absolutely, yeah. That's -- there is only so much you can cover even in -- I think the report came out to 72 pages, awesome. But yes, that is -- and it goes beyond the water sector too, right. It's certainly an area of, I think, inquiry and fascination, right, for all workforce practitioners at the moment.

AUDIENCE: Yeah, if you are going to be competing against Amazon and Google for some of these skilled positions and even the --

MR. KANE: Yeah.

AUDIENCE: -- trades people are going to have more access to technology which will allow them to do higher value works.

MR. KANE: Yes. Well, and then the prospect of automation, right, and even just changing technologies within utilities, for example, right. That's changing the nature of the work, right. And so, are we providing not just the platforms for new workers entering the sector but even existing workers' retraining efforts, right, as we think of -- again, not just the job but the career, right. So, we are talking 20-30-40 plus years, right which is a long time particularly relative to the technology.

AUDIENCE: Right. And then you also look at different generations in the utilities as well going from the baby boomers to the generation Z and how you manage these different types of workforce issues.

MR. KANE: Right. Right. Absolutely. Thank you. Great. So, I think we are ready. So, with that, you know, I would to introduce my colleague and co-author, Adie Tomer and then, Congressman Garret Graves, Chairman of the Subcommittee on Water Resources and Environment. Thanks guys.

MR. TOMER: Good morning, everyone. I think you said good morning in the back. I can't tell if this is on or not. Yeah, you can hear me? All right. How is everyone doing? Okay? Good. Good morning, Congressman. Thank you so much for being here with us.

CONGRESSMAN GRAVES: Absolutely.

MR. TOMER: You know, water is something that we are certainly passionate about. Right when we kicked off the event, our Vice President, Amy Liu asked how many people in the room work in the water industry and it was huge range of hands. So, you are looking at a water crowd here.

CONGRESSMAN GRAVES: They are all nerds. I love it.

MR. TOMER: Yeah. Oh you have come to the right place, Congressman. But I think it's safe to say there are few, if maybe any leaders here in Washington who where water resources are more personal part of both your personal life and your professional life, right? So, I think there is no better way to kick-off the conversation here than to kind of start on that personal level, right? From both your experience post Katrina work, kind of, clean up there, obviously the work here. Talk to us really in that, kind of, personal way putting policy, even politics aside. Why are water resources so important, right, to small towns, the large cities, to rural areas and of course to protecting our natural environment too?

CONGRESSMAN GRAVES: Sure. Sure. So, first I think to the answer

the question, let's talk about what water resources are. A lot of people may have a maybe a smaller view of what water resources are. From South Louisiana where we drain from Montana to New York to two Canadian provinces. So, when you talk water resources in Louisiana, we have too much of it. It's often in our living rooms and we also are having a threat from the South in that we have hurricanes that are coming in and sending surges of water that way. Now that's very much distinguished from water resources that you may be talking about out West, whereby it is, I don't have water to drink or don't have clean water or other challenges along those lines.

And so, in South Louisiana at home, some of the challenges that I have had personally have been dealing with Hurricane Katrina which I want to say I think was largely a preventable event. Not entirely but largely a preventable event. By some measure, you can justify that we spent somewhere around a 150 to 180 billion dollars responding to that hurricane and the other hurricane - Hurricane Rita that we had in 2005 back to back. 150 to 180 billion dollars. Think about that for just a minute. Our back of the envelope calculations indicated we could have spent somewhere around 8 to 10 billion on the front end and we could have saved 90 percent of the 1,500 lives we lost. Think about that for just a minute. 90 percent. We also could have saved 90 percent of that money.

And so, it's personal for me because I will tell you, I had this guilt on me that I just feel like that I could have, should have done more and I don't think I am ever in my life going to lose it. And so, one of things that I committed to was to make sure that we never allowed anything like that to happen again. And so, after Hurricane Katrina, we came in and we were able to pull together through about 42 different funding sources about 25 billion dollars. And we built levees, we built floodwalls, we elevated homes and buildings. We restored our coast. We acquired coastal forests, one of our best natural barriers for storm surge, put together a coastal master plan that really is on the cutting edge of technology using every single tool in the toolbox that we could find and brought together some of the best scientists from around the world to do it.

And so, we made more progress in about a six year period than really forty year period prior to that. We integrated all of our structural and non-structural levees and floodwalls again with our wetlands restoration and in restoring natural features all in one program which allowed us to really make extraordinary progress down there. We still have a lot of work to do but I can say now that in the Greater New Orleans area, we have the best protection system. We have the most resilient community than we have ever had down there.

But this a dynamic issue. Sea rise, we have some of the fastest subsidence rates in the world in South Louisiana. This is not a deal where you say, okay, I am in the ins and I am done. This is a process that you just continue to work on.

So, lastly I will just say, as I opened up, I talked about how we think we could have spent 8 to 10 billion on the front end. I feel very strongly that our water resources program in the United States is entirely backwards. And whether you want to talk about water rights, you want to talk about water management, you want to talk about navigation, or you want to talk about disaster policy. We repeatedly spend exponentially more money after a disaster happens rather than spending a fraction on the front end and actually being proactive. By the way when you are proactive you more resilient communities, more resilient economy, more resilient environment, and we are missing those opportunities. But we are beginning to pin it.

MR. TOMER: Well, that's a perfect transition to what you have got going on right now. So, we are huge fans here at Brookings and generally say, Washington does work and, you know, you could probably walk around with that banner right now in D.C. A Water Resources Development Act that had over 400 'yes' votes, is that right?

CONGRESSMAN GRAVES: 408 with only 2 'no' votes but who is counting?

MR. TOMER: Yeah. Right. It really is an excellent record of success on the power of what's in that Bill. But, you know, let's take the, kind of, high level view that I

think you just did wonderfully on why this matters personally. What were you all hoping to achieve, right? And then we can probably dive into in specific elements or you can yourself. But what do you want that Bill to achieve touching on some of those challenges that you see both in Louisiana and across the country?

CONGRESSMAN GRAVES: So, the Water Resource Development Act primarily deals with the U.S. Army Corps of Engineers. And we used to say behind their backs all the time, they may be slow but at least they are expensive. Which it is funny, it is. But here is the thing, these are real repercussions on real people. So, right now, the Corps of Engineers has a 100 billion dollar backlog on authorized projects. 100 billion dollars.

And the White Houses, and I want to be clear, plural, this transcends various administrations, have asked for around a billion dollar in construction funds. Now Congress comes in and we bump those numbers up but whether you are talking a billion or when Congress comes in and bumps it to 2 billion, look, it doesn't take a math expert. You have a 100 billion dollar backlog of authorized projects. You are getting one to two billion dollars in funding. You do the math, add inflation, and you will finish approximately never. You are not going to finish it.

And so, decades ago, a Corps of Engineers authorization by the Congress meant something. It meant that your project is actually going to progress. And now I am concerned that it's become more of a press release and then a death sentence because right now, though we have other various programs in the Federal government like community development block grant, recovery dollars, flood mitigation dollars, FEMA mitigation dollars, you are prohibited from spending any of those other funds on a Corps project. The project that has had greater environmental scrutiny, greater cost to benefit analysis and technical feasibility and other things, you are prohibited.

If these are important projects and they are important to the nation and they have been authorized by the Congress and recommended by the administration, we need to be prioritizing these and putting all the funds together. We don't need to be putting

all these impediments or roadblocks in place. So, what the Water Resources Development Act does is it begins laying the groundwork for a faster implementation process, a more efficient implementation process. Allowing counties, parishes, states, and other non-Federal entities to partner better with the Corps of Engineers to actually get the projects built. And when I was doing this work in Louisiana and building these projects, we routinely, we were able to build projects for one-half to one-third the cost of the Corps of Engineers.

So, you have everybody out there, the President and others talking about the infrastructure package and when you do that people often talk about money. Oh, we need to dump a whole bunch of money into this. And yes, we need more resources but if we are able to replicate some of these efficiencies that we demonstrated in Louisiana, on a broader scale, you can build twice or three times as many projects for the same cost. Let's look at this process by which we are developing these projects and implementing these projects and figure out how to squeeze some of the efficiencies out.

Last thing and something that I think is a big deal in there. We begin laying the groundwork for taking a fresh look at the Corps of Engineers because think for just a minute, if the President came to you right now and said hey, I want you to develop a water resources capability within our Federal government. I want you to develop something that maintains our navigation channels and protects our wetlands and builds levees to protect our communities and other water resource missions. How many agencies -- and he said give me a recommendation of where this is going to go?

How many agencies would you go through in the Federal government before you got to the Department of Defense? And then said, yay, this is what we are going to do it. I mean, really, Secretary Mattis, North Korea, China, Russia, cyber security, national defense, I want him focused on that. I don't want him also to say oh, we are going to look at this wetlands permit again. No. It's incompatibility with mission which I think has resulted in slow and expensive -- the joke that I made earlier.

So, this needs to be a priority within an agency, it needs to be a cabinet-level priority to where when there are problems you can have a leader step in and say, yes, I have got time, I have got bandwidth and I have got compatibility in my mission and priorities to take this and actually fix this. And not allow a mission or an agency as critical as this to devolve into a 100 billion dollar backlog to where many in Congress say, I am not sure this is a good investment.

MR. TOMER: Right. We love those kind of innovative ideas here. I was taken this morning, as probably many of you were, when you opened the newspaper that your former colleague in the house, Congressman Mulvaney, right, announced that there might be proposal about merging agencies, right. We are obviously in public here a little bit but if you could speak just frankly, right, what do you think the tolerance will be -- not for that I mean, that's not important I am saying -- what do you think the tolerance could be, what do you think the attitudes will be in Washington to even just have a debate, right, about maybe moving the Army Corps and it's approach to potentially somewhere else within the Federal infrastructure.

CONGRESSMAN GRAVES: I think it needs to happen. And I think that there is or will be a tolerance there. Now look, it really depends on the actual recommendation because I think you take something like this and you start explaining to people, I think that, you know, hey, look, we think this would fit better in Department of Transportation, it's an infrastructure agency or the Department of Interior that has bureau of reclamation and already has some water expertise or, you know, there are other agencies where you can find better compatibility. And so, you take an idea like that, yeah, I think you can get support for it.

But obviously, you know, you can club with some other ideas that I think are going to run into brick walls. But the idea that we do take a fresh look at our government and figure out how do we reinvent this or what does a 2018 or perhaps a 2030 government structure look like. It's something that we absolutely need to do.

So, my first foray into working in the Executive branch is when I went down to Louisiana after Hurricane Katrina. And I remember looking around and one of the first conversations I had in the first two weeks I was there, I was like Governor, we have five agencies that are tripping all over each other. And, of course, the initial response is that, oh, no, no, no, you are wrong, you don't understand. And so, I said look, let me see if I can put some information together and come back. All right, yeah, yeah, whatever. You know, just get out.

And so, I did put some information together and came back and said look at this, we are tripping all over each other. And then, you know, oh, well, actually you know what, maybe there is some merit to this. And they let us do a reorganization. Five agencies below up components of them, rebuild them and that's what I mentioned earlier. 42 funding streams that previously had been managed in a disparate manner, pooled them together, and began implementing a mission.

And now, something else that we did and this is something, you know, it's one of those things like, oh yeah, government has a monopoly. Think about if you were in the Olympics right now and you were in a race. And you were the only person in the lane. Do you really think you are going to get your PR, your personal record running by yourself? No. You have somebody running next to you and running next to you and running next to them and next to them, you are going to feel like competition, you are going to be running harder, you are going to be your best.

And I think that in some cases, this government monopoly allows for a little for a little bit more lackadaisical attitudes, a little bit less efficiency, a little bit less innovation. So, one of the things we did when I got there is I said, look, we are going to put these projects out and we are going to let local levy districts, or parishes or other sister agencies actually coming in and building these projects. And if they can build it better, faster, cheaper, we are giving them the money.

And we did. We gave away the money for, I think, the first two projects

that we did. And, of course, the people that were working in our agency, wait a minute. I have been working on this for eight years and you just gave it away. Yep, we did because they had a better proposal. And I will tell you, just overnight, woke folks up. And we ended up increasing output, I think, it was like 500 percent increase in output by taking the same funding streams, pooling them together and forcing a little bit of competition to the system.

So, my point is that I think, look taking a fresh look at government, government structure, how to integrate a little bit of competition, I think it's healthy because otherwise you get complacent, missions that perhaps could be eliminated with technology and others, they are not if people just justify their jobs and say, look I have been here since 1980 and I need to stay and develop a role for my position, I don't think it's healthy.

MR. TOMER: Yeah. And no, we couldn't agree more. I think that the ability to innovate and think outside the box and a little bit of competition is a good thing. And I think there is real potential there. You know, we are huge fans of WRDA. I think we hope that it moves through the Senate. I think there is a lot of real innovation in there.

One of the elements that we didn't see, which I know people are passionate, so, you know, it's not insult at all, it's not intended that way, was workforce. And there is a lot of talk in Washington just broadly, right, on workforce, how do we think about apprenticeships, let's say? What can be the renewed Federal role, right? So, let's assume it's, you know, we are year from now, word has passed, we think about the next iteration, right. How do you view -- an obviously you are passionate about education too, right Congressman -- so, how do we view merging these kind of sectors? Not necessarily just water but, you know, can be infrastructure broadly but the opportunity here from the Federal level down, even though it's going to be a lot of bottom up frankly. This opportunity to merge the skill trades with the need for more economic opportunity for Americans looking for really well paying work.

CONGRESSMAN GRAVES: So, I think it's a great question and I think right now it's something that you are seeing a lot of attention right now. So, we are seeing

a growing economy, we are seeing lower unemployment right now. So, you now see, sort of, the bottleneck or the things that are throttling the economy. I think, two things. Number one its workforce because we don't have the right compatibility of skills with the jobs that are available. And you can look at statistics all over the country and virtually every state shows this. You have people that are looking for jobs, you have jobs that are available but that are not connected because in most cases, I think the compatibility of skills. And so, you have got that. And then on infrastructure, you have got a lack of infrastructure, I think, to facilitate the growing economy. So, those are the two things that our throttling our economy right now.

On the education side, I think, that as many of you know, much better than I do, I think we pushed everyone and told everyone that your end zone is a four-year degree or an advanced degree. When in reality, and the state of Louisiana and many other states, those aren't the skills or the qualifications that many of the employers are looking for right now. They are looking for skilled labor. They are looking for certifications, accreditations, and others. And so now we are trying to catch up.

So, I am going to merge these ideas here. So, I talked earlier about how we are being too reactive in our water resource policy in disasters. And so, what happens is we have a major disaster, we dump absurd amounts of money into them. And so you create this surge of jobs associated with recovering from Hurricane Katrina, Hurricane Rita, Hurricane Gustav like in 2008, Hurricane Sandy and Isaac in 2012, Hurricanes Harvey, Irma, Maria and Nate last year. But that was 2005, 2008, 2012, 2017. That's not a consistent job that you are just sitting there doing.

If we can lean forward, be a little bit more proactive on this, this is an industry. Water resources is an industry and I think we are able to better resource this, to be proactive and to have this as a -- instead of spending, you know, again 150-180 billion dollars in 2005, having another surge of funds in 2017 where we are hitting similar levels, that's not a job you can sit in for 10 years. That's, hey, I have just got this great job for a

year, I got paid a bunch of money but now I am out of work for a year and a half and I am trying to find something else.

So, being more consistent with our appropriation of dollars, leaning forward, and identifying where the vulnerabilities are, and just being proactive. You create a sustainable industry, a sustainable workforce. In the state of Louisiana, when I was working there, I recognized that we were effectively creating a new industry in Louisiana. We were, sort of, the canary in the coal mine with the subsidence and the sea rise challenges and the sustainability of our communities.

Two million people live in South Louisiana and it's 65 percent of our state's economy. And so, we created a water institute, the Water Institute of the Gulf, a not-for-profit entity to be a partner with the State of Louisiana to, sort of, work on the expertise to the Center of Excellence to help development the workforce for the future. And make sure that we are applying best science and lessons learnt and everything else. And, I think, that was really compatible with the job creation part. And as a result, and I don't what the statistic is now but when I was leaving that job, we had more jobs associated with water resources and sustainability, community sustainability than anywhere else in the country in South Louisiana, not Manhattan or LA, South Louisiana. And so, it's pretty amazing.

MR. TOMER: Yeah, it absolutely is and we are proud to say our research found that that is the highest share in the country. Yeah, well aligned, perfectly. Look, I have had the luxury here for asking most of the questions. I would love to get a chance to turn to a question in the crowd. But it's my responsibility, we are here in Washington, it is post the election when both candidates talked about infrastructure, we were promised infrastructure, Congressman.

CONGRESSMAN GRAVES: Yeah.

MR. TOMER: And obviously, you delivered. And we know that there has been a pretty lively debate around aviation right and I think it's, I say it in a lower-case informal way, it's kind of stalled, right but I am saying it's out there.

CONGRESSMAN GRAVES: Yeah.

MR. TOMER: But let's talk about the big package, right, whatever it might be. What's going on on the Hill? What do you think the chances are? We know we have got a big election coming in a few months here, right. Can we expect to see anything before then? What do you think the tenor is up there?

CONGRESSMAN GRAVES: Well, so, look. It's certainly out there in the public, the demand for an infrastructure package is strong and it's something that's actually, when you talk about it at the 100 thousand foot level, it has broad bipartisan support. When you start digging into what infrastructure is, I think you begin understanding that people have very different definitions.

Let me go back to what I said earlier. If we are able to repeatedly demonstrate in the State of Louisiana that we can build water resource projects for one-third or one-half the cost of what the Corps estimated -- I am not a fan of coming in and dumping mounds and mounds of cash on that existing inefficient system. I think the first thing we need to do is take step back, look at what is it about our current project development delivery models that have such great inefficiency.

MR. TOMER: Right.

CONGRESSMAN GRAVES: And let's first work on helping to solve those problems. Let's help on doubling the output of projects with the existing funding stream. Then come in and begin resourcing that better -- putting more funds into it. So, rather than coming in and doing this, you know, gazillion dollar package some people talked about, the Speaker of the House said, look, what we are going to do is we are actually going to break this up into components.

And so, back on December 21st and again in April, we passed a Disaster Reform Bill that if you look at it, it actually has infrastructure dollars in there. And it begins the shift from entirely reactive and inflexibility to leaning forward and being more proactive in providing resources. And so, there is a Disaster Infrastructure Bill moving.

You mentioned the FAA Bill that we did in April. HR-4, so that Bill is moving and the Senate, I am not sure exactly what their strategy is over there and I think I can say that across the Board -- nobody is here to defend them. So, seriously -- and from what I hear though they may be taking up aviation together with disaster, sometime next month, I think. So, one of the many rumors out there but aviation infrastructure is to some degree moving.

Then, of course, the Water Resources Bill that we did a few weeks ago, that one is moving. And Chairman Shuster, the Chairman of the Transportation Committee, ranking member to DeFazio of the Transportation Committee, they are going to be introducing a joint Bill that is a little bit broader in scope, largely roads, bridges and I think that it's going to be pretty thought provoking legislation as well.

So look, rather than coming in and doing one huge package right now, we are looking at breaking up into smaller bite size chunks. I don't see this as being an even-even, if we split it up into four or eight bits, I don't see it even being pulled together and being a silver bullet. I think that this is going to be an evolution where we come in a few years and have to continue making progress.

One of the strategies that we employed on the Water Resources Bill that I think yielded the type the success that you don't see in Washington, is we agreed on a bipartisan Bill from the -- as soon as we went into it. So, we are not putting anything in here that doesn't have support from Republicans and Democrats in our Committee. And the vote yielded that -- or demonstrated the strong support for the Bill and the bipartisan support. And so, you know, look do I believe, me personally in a vacuum that there are some missed opportunities in the Bill, yeah, I do. But I also believe that us working together on this and having bipartisan support is really important.

MR. TOMER: Right. Well, comprise means someone always gets something out but the whole package gets more, right. So, it's promising to see. Well, listen, I think we have time for at least one question. Are you comfortable taking it,

Congressman?

CONGRESSMAN GRAVES: Yeah. Yeah. Absolutely, that's easy.

MR. TOMER: All right, good. Remember you got a lot of crowd here so let's what happens. All right, so in the back. And please, while the mike is coming to you, please introduce yourself and as it is standard Brookings protocol, please just make sure with what you say it ends with a question mark.

MS. SOKOLSI: My name is Ann Sokolski. I have not background in the water infrastructure but my question is, is there any talk on the Hill about the desalinization of ocean waters and the infrastructure to transport it to areas with low aqua flows?

CONGRESSMAN GRAVES: There is talk about it. As you know, desalinization is incredibly expensive and so as technology gets better, as we all know, the cost of diesel has dropped significantly. It's still much higher than other solutions but desalinization is -- it is a tool to the tool chest. It is something that we have talked about. In fact, I was in a meeting just recently where they were talking about is there an opportunity for us to take some of the flare gas that -- some of the gas that's being flared and figure out is there a way to pull that together to do desalinization and a way to help try and solve two problems and bring down costs and things along those lines.

So look, just like I talked earlier about coastal Louisiana and there being multiple tools in the toolkit. I think the desal is one of the those tools that while it is not necessarily the most cost efficient solution, in some cases it still is the best option. And so, I think that it is going to continue to play a role in overall water supply but I also think that we need to continue to work to have to help to bring down cost to make it a more affordable option in many areas.

But over the long-term, you look at trends in population growth and water availability and things, we have to get good at desal. There is no doubt about it.

MR. TOMER: Okay. Well, unfortunately, we don't have time for more questions. Please join me in thanking the Congressman both for his time and for his

candor here.

CONGRESSMAN GRAVES: Thank you.

MR. TOMER: Thank you for coming. That was great. And so, I am going to invite our next panel up to the stage so we can kind of now flip from the Federal level down to the local level. So, I am going to move from my left to right here and announcing, kind of, who as they come up and they are going to get the mike, right.

So, we have first Kishia Powell, who is the Commissioner of the Department of Watershed Management, all the way up from the city of Atlanta, Georgia. Kishia runs a Department that serves over 1.2 million people per day. So, I don't know about you that sounds like a tremendous amount of people. That's a lot of responsibility, Kishia. She also has deep experience in local government working from ever from Jackson, Mississippi, to right up here in Greater -- in the greater kind of D.C.-Baltimore area working in Baltimore city too, responsible for a huge multi-billion dollar capital campaign as well.

To Kishia's left, is Andy Kricun who is Executive Director and Chief Engineer for the Camden County Municipal Utilities Authority. So, Andy and his team serve over 500 thousand customers in Southern New Jersey. And Andy is also more than just a business manager. Similar to Kishia too, they are both licensed engineers, right. So, they bring that expertise. And I want to stress after we just heard about agreement in Washington happening too, Andy is an award-winner in professional ethics. So, you know everything you are going to hear from him today is honest and straight forward.

And then to his left is Katie Spiker, who is a Senior Federal Policy Analyst at the National Skills Coalition. Katie is a true expert in Federal workforce history. She has been incredible helpful during our project was here -- here for our roundtable. So, we are so fortunate to have her here. I promised her I was going to do this. She does have JD from Georgetown University. But I am Florida Gator and she is a Miami Hurricane. So, we will see how we handle things here today.

MS. SPIKER: We are not going to into that during the panel, yeah.

MR. TOMER: All right, all right, all right. So, let's jump right in, right. So, Joe thank you so much for helping to set the table for us. As usual, when you come to Brookings, you are going to get more stats than you can handle. Hopefully it will help set the table for what's going on in a whole sector.

And so, I think we learnt a lot about how much work is out there, right, really. There is a lot of people employed here, there is a lot of opportunities. What I want to start off with, obviously I want you all to introduce yourselves here to the crowd, I kind of handled the details, but what I want to, kind of, start off with this, especially with Kishia, you and Andy, sort of, on the utilities side, is from the workforce perspective, I mean, you are managing real customers, real amounts of people, what keeps you up at night from a workforce perspective. No soft balls here.

MS. POWELL: That wasn't on the prepared list of questions here. I think what keeps me up at night as far as the workforce is concerned is being able to have the workforce we need to maintain the infrastructure investments that we are making, right. You mentioned our capital improvement program is 1.2 billion dollars over five years and we probably about half way through that segment. But we identified a need of over 8 billion dollars of infrastructure investment. And if you have been paying attention to Atlanta news, we have had some pretty significant water emergencies over the last couple of weeks.

And so, having a team that can manage the infrastructure in those water emergencies but just day-to-day is really vital. We have reached a 130 water main breaks in one month for the month of January and we are facing a 55 percent retirement eligibility rate. It's difficult to recruit young talent, as Joe said in his report. We joke in my department that we have the millennial movement going on. It's difficult to -- it has been difficult to connect with what that generation wants to do and contribute because, you know, they learn differently, as has every generation I think someone mentioned that.

But that retirement eligibility and we are seeing the retirement, we have a

high attrition rate, we have a very high vacancy rate because it's been difficult to recruit. And so, what we just recently did was a competitive pay study. Because pay is one element of it but it's not the only element. And so, we started with doing a competitive pay study for our ten hot jobs. Many of those jobs are on the list that Joe spoke to, so that we could get our folks to a competitive pay. We were severely under market in some of our critical positions, boots on the ground positions.

But we have got other issues that we have to overcome. The licensure barrier, the barrier of folks that don't have a high school education or even a GED. So, those things, kind of, keep me up at night because we have to have the workforce moving forward and I can touch on as we talk some of the other things that we are doing to prepare for the future.

MR. TOMER: That's great, yeah. We can't wait to hear on innovations. Let's get this tough stuff out of the way, if you will. So, Andy same question to you. What's keeping you up at night?

MR. KRICUN: Thanks. That's a great answer from Kishia. I guess there are three things that are keeping me up at night. The first is that we have a -- over 50 percent of our workers are eligible for retirement within the next five years. So, I am concerned very much about our ability to sustain our work. That's the first thing.

The second thing is that, the city that I work in Camden, New Jersey is one of the most economically distressed communities in the entire country and we have an unemployment at a rate of 10.4 percent. So it bothers me when I look -- we (inaudible) is a 100 yards away from a residential neighborhood and I see the people that live there needs jobs. We need replacement workers and I can't hire them because they don't have the training that they need.

So, the three things that bother me are lack of replacement workers, the fact that our citizens need jobs, and that our citizens have lack the training to become the replacement workers to fill our positions.

MR. TOMER: Yeah, I got you. Well, that is a great transition for both of you -- to Katie, right? I mean you kind of see it from the other side of the aisle right. You try to make sure we can feed in people with the right kind of skills, right? How much does what we have heard both, certainly from Kishia and Andy but also from Joe's work and even from the workshop when you are here, right? How much does what is happening in the water industry connect to how you all see things from the workforce side?

MS. SPIKER: It completely aligns with what we are seeing in the workforce system broadly and with infrastructure industries. National Skills Coalition focuses DRCB's advocacy organization, we focus on middle skills job. So jobs that require more than a high school diploma but less than a four-year degree which is where so many of these water jobs fits on plan.

And across the country, 53 percent of jobs now and into the next 10 years are going to be in this middle skills range but only 43 percent of workers are trained at that level. So a lot of policies that we are looking at are exactly what you were talking about Andy. How are we making sure that the people that are -- can be hired into your job pool and pipeline, actually have the skills to get there. So it's consistently one of the issues where there is a lot of opportunity for Congress and the administration to act because like Representative Graves was saying that there is this bipartisan energy behind skills and jobs training in a way that offers a lot of opportunity for actually moving something forward in D.C. right now when so many conversations are not entrenched in that bipartisan part.

MR. TOMER: Yeah, got you. No, it is a positive -- well, as we promised, right? We got the tough stuff out of the way. Let's get to innovations, right? And that's what is so exciting why we are so excited to have certainly both of you from out of town too, right? And thank you for coming all this way.

What are some of those innovative programs that you all have gotten started to, starting to address some of those challenges that --? Maybe to say it differently, what's the kind of innovations you can have that can help you sleep better at night, right?

MS. POWELL: So one of our many initiatives is taking the Department of Watershed Management which is regional water waste water and storm water utility to a smart a utility in every aspect. So this idea of the utility of the future for making sure that we are using data to drive decisions, we are more efficiently managing our operation. But that takes looking at the skillset that moving to a smart utility will require. So we developed a framework for our workforce development program called Stream Works. Our folks have been working with our colleagues in San Francisco to look at their bay work framework and what types of training opportunities and partnerships it requires to develop those skillsets.

But in terms of internal and external pipeline development, one example that -- we just kicked off a program with our city's Department of Corrections to start building a pipeline in one way using that relationship also with the state to hire pre-release inmates. These are non-violent offenders. We took nine individuals in this pilot program and we put them in watershed training positions. So this is providing a pathway to employment for folks that would have challenges getting positions. As Andy said, those folks that you see need employment but you don't the vehicle to hire them. We also have a Steam internship program that has hired -- we have hired over a hundred college students.

And then, we are working on partnerships with local workforce development agencies, Atlanta Technical College offering CDL scholarships from the utility. And we are putting a focus on getting those employees internally that did not have the high school education required for certification, getting them training so that they can then apply for certification.

MR. TOMER: That's great. And Andy, same idea. I mean, how are you able to associate that third bucket, right? How do you think about the training and the skills to kind of tackle one and two if you will, all right?

MR. KRICUN: Thanks. Well, I think, the first thing it starts with is, what is the perspective of the utility? I think, Kishia mentioned the utility of the future. So I think the old paradigm for clean water utilities was to stay under the radar, stay away from the

public, stay away from the regulatory institutions, stay away from the press, stay away from these sorts of things, and just meet the permit. But then the new paradigm for the utility of the future is to be an anchor institution, like Joe was saying earlier, that we are committed to the well-being of our public that we serve. So we are not just trying to meet the permit, we are trying to be environmental champions, we are trying to be community service champions.

For example, Camden city has a combined sewer system like Atlanta. When it rains, there is combined sewage flooding in the streets. We can solve that with a grey infrastructure project but instead we look for a grey and green, green infrastructure that not only captures storm water but provides a green amenity for the residents of Camden. But then the next step is your good begets good, we could hire a landscaping company to maintain those parks and green infrastructures but instead, we developed the PowerCorps program borrowing from our neighbors across the river in Philadelphia. We hire at-risk youth and train them to maintain the parks and rain gardens that we have constructed.

So, in that way, these youth who are like Kishia has described in her program, these at-risk youth 18 to 25 and young men and women, who may have some kind of record, don't have a high school degree, a lot of barriers to employment, they work eight hours a day -- four to five hours a day, they are actually working on the rain gardens, three to four hours a day, they are getting life skills training and getting prepared for how to make a resume, how to go to an interview and then job placement to the next job. And we have hired a few of them and then the new cohort rolls in.

So the idea, I think, starts with the sense that you are not only -- of course, our core mission is to protect the water and meet the permit. But also, the fact that we are community service champion and we want to look for ways to get jobs into the hands of people that need them most in our community.

On the other end of the spectrum, we also have a program, that Joe

mentioned, the Green Ambassador Program, where these are the best and the brightest in Camden, we hire high school students each summer and we partner -- we have an initiative called the Camden Collaborative Initiative in which we partner with over 60 environmental non-profits, some national like the Trust For Public Land, and the National Parks Service, some local and regional, and they provide, each day, a new environmental experience to the 20 best and greatest Camden high school science students that were selected by the school district under (classmen) who then each day get, one day they will paddle with the Parks service, and another day, they will plant a tree with the Tree Foundation. They'll come to our wastewater treatment plant for a day. 25 different environmental experiences and they go back to the schools because they are under the classmen and are our Green Ambassadors and hopefully, then go in for environmental science, have a leg up when they apply for college. So those are some of the things.

But ultimately I think what is really needed is to do something like Kishia said and Joe said, Bay Works is a tremendous template to get a training program that will create a pipeline. I would like to do it too. A pipeline --

MR. KANE: Legally required.

MR. KRICUN: Right. To create a pipeline to convert the unemployed of our city into the replacement workers for our plants.

MR. TOMAR: Got you. No, please.

MS. POWELL: Well, I was just going to say that, you know, when we have these discussions, we always focus externally on getting folks to come into the utility. Part of our challenge is keeping people too. Retaining the workforce that we have because many of the folks that are eligible to retire, they still have a lot of years ahead of them to work. What they are doing is retiring and going to work for a consultant or going to work for another utility. And so, part of our program too was looking at what type of retention measures should we be putting in place. And that we found some good stuff in the Bay Works Program.

We don't have defined career paths. People come in, they are an operator and they have been an operator for 30 years. And then they are ready to move on and do something else. Attracting a younger worker to our utilities, they want to see where they will be in five to ten years. If you tell them you will be in the same job for 30 years, then they are not going to want to come work for you. So, we are having to define those career paths for folks and then figure out how to train the staff that we already have so that they are prepared to take another step and stay with us. So that's part of it as well.

MR. TOMER: What I want to throw at you Katie, but really all three of you, is how do we make sure that we bundle all these local innovations in a way so we know what is happening, right? And so from the workforce kind of the side of equation, if you will, how do you all hear about all these various innovations, right? Think about what those kind of common best practices to be almost like a permanent practice, right? And then vice-versa. How do you make sure that anchor employers like utilities know the kind of scalable solutions that the workforce starts developing so that it can create those less clogged pipelines to operate - the opportunity? That was my requirement too.

MS. SPIKER: One thing that I can't stop thinking when both Kishia and Andy are talking is the kind of investment, both of time and energy that you all are talking about building this pipeline and developing the next -- which I can't even think of as a pun because it is workforce that all we ever talk about -- but it takes a lot from you and your staff -- I mean I would be amazed, I am sure, by even the number of people that you have internally working on this development let alone the kind of partnerships that you are working with. And I think that's one thing that is difficult to express is just how much it takes industry engagement and industry buying to be leading and starting these conversations.

And from across industries, for the ones that are expert in waste water management or in manufacturing a, you know, a widget or whatever you are an expert in in your industry, there is often a few people in your company that are working in HR or talent development or something like that and so that's not when the whole company is ready to

move and be mobilized around. And so that's really where the workforce development system can come in.

And I think, I would be interested in some of the funding that you all are using to support the corrections program that you are starting. I know with Bay Works, the San Francisco Public Utility Commission is really leading that work and Megan Scott is here from there and can speak much more eloquently about what they are doing than I can -- but they are funding, the initial funding when they went to do the analysis of what the labor market needs were came from the workforce development system. And so, each state's governor has this 15 percent funds that they get every year through the workforce development fund that they can spend on innovative practices.

And California identified part of their public utility analysis as one of those priorities. They are continuing to be funded in some of their existing work now through additional funding from the workforce development system. And so there really is a role for the workforce development system to help to support what industry is driving towards. But it takes those partnerships at the local level, whether convened by industry, workforce system, education providers, to really ensure that local focus is embedded in what the industry is doing and how the workforce and education systems are supporting them.

MR. TOMER: And Andy, you want to jump in, right?

MR. KRICUN: Well, one thing I want to talk about is that there are 16,000 waste water utilities in the country and over 60,000 drinking water utilities and it is silly for Atlanta or Camden or San Francisco to develop 14,000 or 16,000 different solutions in a silo-ed way. And the thing about the public sector entities is that we are glad to share information and we often do. For example, the PowerCorps Program like I mentioned, was Philadelphia's creation and when we heard about it was haphazard because we are right across the river. They gave us the entire package and we duplicated it. So the thing that really needs to be done is to find out what is the state of play currently in the industry, collect it into one place, and --

Now that I see Adam (Kransis) here, he has been working with us developing some sort of a compendium of workforce initiatives which we can then share with the entire -- like a cookbook or a playbook -- so that the other utilities can say, oh, I didn't think of that. No one is doing everything. No one can think of everything. And the idea is to get this sort of compendium out there so that at least the utilities will see what kind of options are already being done. That's the first thing.

The second thing though is that as Katie was saying, it is hard for us to do it by ourselves. So our PowerCorps Program, we do fund it but yet, we are also getting AmeriCorps funding and that makes it possible. So if we were just to get a landscaping company to fit to maintain our green spaces, our parks and rain gardens, it would be -- and if we had to pay the PowerCorps out of our pocket, it would be ten times more expensive because of all the life services and life skills training, that sort of thing.

But the AmeriCorps grant makes it feasible. So it's a partnership, like Katie said, we are still spending a little bit more money but on a triple bottom line basis it's a tremendous win because these 180 young men and women are getting the training and an opportunity that they wouldn't get otherwise and you can't calculate not only the good that is done to each of them by having an opportunity and their families but also the harm if they wouldn't do, you know, because they are at-risk youth. So I think the benefits are incalculable. But without the AmeriCorps program subsidizing and paying 50 percent of the funds and we pay the other 50 percent, it would have been almost impossible for us to do it. There is definitely a partnership that is needed, as Katie said.

MR. TOMER: That's a perfect segue to where I want to go is actually at the regional scale. So let's see now, Philly plus Camden plus right even down to Wilmington -- we are geography nerds here, right? For greater Atlanta, it is 20 plus counties now, right? So when we think of that kind of regional scale, from what all three of you have mentioned there is clearly, there is scalability here. What are the ingredients you all need to better collaborate at the regional level, right? Is it better communication cross-agency? Is it better communication

across jurisdiction, right, but with common agency? What's both getting in the way but when it works, whether it's purely the workforce side, or purely the water side, what's kind of causing elements to have success, right, on that kind of collaborative angle?

MS. POWELL: I think Katie hit the nail on the head. It takes intentionality in order for you to have that constant intentionality, you have to have dedicated resources. So we are putting -- we are using water and sewer funds to develop the curriculum for the training - the watershed trainees - we have hired a fulltime trainer. So that's great. We partnered with Urban League to help us administer the program with Department of Corrections and we are doing so many other things. But when you are -- the folks that we are using to move our workforce development initiative forward is my CAO and our Human Resources Director. Human Resources is largely focused on transactional stuff and my CAO has several other divisions that she is managing from fleet to facilities and other administrative things.

So one of the things that we have to do, we know we have to do, is bring on fulltime workforce development staff or team so that they can start working on the partnership opportunities that we have identified to get those solidified and in place. We know that other utilities in our region like Gwinnett County and Cobb, Marietta and others have a similar focus. And as GMs, we have met in the region to talk about the challenges that we all have with the water workforce and retirement eligibility and those things but it really takes having a coalesced group.

Similar to what we see in San Francisco and EPA have to give (Jim Horne) a shout out, he is calling for national convening led by EPA and (Nokel) will be at the table as well. Those groups are helping us to -- with the thinking that we need around this issue while we are dealing with the day-to-day operations. It's so difficult to balance but it is, I think, we are at a point now where utilities know we need to do something. Notel Henifin from Hampton Roads Sanitation District, he has some -- he has a program there for training.

So, we don't need to reinvent the wheel. We just need to get in a room and figure out what is being done where and as Andy said, put it all in a playbook that we can then

we start access and implement because I think we have talked about the challenges and now that we all know what they are.

MR. TOMER: Right. So is it okay -- I just want to -- same question to all. It sounds like we need an institutional architecture though at the regional scale, right? Is that right?

MS. POWELL: Yes. Absolutely.

MR. KRICUN: And one thing I really want to stress is that this is not an urban -- I mean we are in Camden and in Atlanta which are cities but this is an urban and a rural problem. I mean basically wherever there are people, people use water. So therefore there are water treatment plants and they are often not in affluent communities and so -- where people drink water, use water, and water treatment plants needs jobs -- and people need workers rather and people needs jobs. So this is an opportunity across the country, not just in cities, but also in rural areas.

But Kishia said it very well and Katie said it too. It is intentionality. If the utility goes to the old paradigm of where it is to just fill the job or meet this task, then that is the only lens that they look through. Then they are not going to look -- they are going to miss a lot of opportunities. But if clean water utilities look at themselves as community service champions, anchor institutions in their cities and say, how can I fill this role but also do right by my community and deal with this -- in case of Camden, it is 10.4 percent unemployment rate. Can we fill our water workforce needs but also deal with the unemployment problems in the cities and towns and rural areas that we serve, that is a win-win opportunity. So intentionality is the first thing. If you are not looking at the right direction, you are not going to find the solution.

And I agree completely with what Kishia said that this idea and what you said as well that this idea of an institutional architecture is needed and due credit to Jim Horne from EPA and Adam and Nathan for NAQUA taking the leadership and trying to develop this water workforce convening to at least get the water sector people in the same room. But we also need to get help from the Department of Labor I think and also Education I think.

Ideally, what we would like to do in Bay Works is already set this template of having like a partnership with technical schools, vocational schools, community colleges to help train -- to eliminate this training gap to train our residents and then help them become our replacement workers.

MS. SPIKER: And I think what you said about it being urban and rural is really important too. I was just asking Joe before he came up to see if I was -- the stats are correct. But thinking about it that it is rural and it is also about not just large employers, but it's also about small utilities need to develop their workforce as well. So it's the capacity that you are thinking about bringing on dedicated workforce development experts, that's incredible. For a utility that only has a few people, they probably don't have the capacity. And so partnering with the workforce development system is even more important.

In rural areas, where the community college is probably the only skills training institution in the area, then you have got, you know, a workforce development system that is covering an even broader area. So convening those partnerships is more difficult and working through more necessity with the community college system who may or may not have the expertise and the capacity to run a cohort of one or two students for a small employer, it becomes important for those small employers to build skills to come together which then just requires more infrastructure at the regional level.

One other thing that I will say kind of in the workforce and skills development piece there that we have talked about a few times is the idea of apprenticeship in developing the next pipeline of workers. And I think Milwaukee has developed over the past few years -- oh no, I am going to say the wrong actual occupation. Let's see. Waste water operator apprenticeship. So they developed this apprenticeship program four years ago in part through partnerships funded through Department of Labor funding for apprenticeship initiatives. And they haven't seen a ton of uptake in actually using and folks engaging in the apprenticeship program and I think that's where these partnerships that they have been running with the workforce development board and the Water Council of Milwaukee have been really useful in

helping to build support for the idea of apprenticeship to train the pipeline and also then, giving the opportunity as they move forward and we see more federal investments in this area to build off of that foundation they have already built.

MR. TOMER: Yeah, please.

MR. KRICUN: I am sorry. I just wanted to add on to what Katie said for this idea of the fact that it's hard for cities like Atlanta and cities like Camden to figure out a way to develop a program between community colleges and schools and ourselves, imagine with the rural and smaller capacity -- that's why this need for a template where somebody can take two or three types of examples off the shelf and develop it themselves rather than come up with 16,000 different times. It is impossible. And that's really the big gap nationwide but also the opportunity because these water utilities are more similar than different. I mean they could be sized differently but their issues are the same. And so the key will be to make it easier to reduce that resource gap by developing a template that they can just use and work with their community schools and follow it instead of having to create it anew, afresh.

MR. TOMER: Yeah absolutely. Well, I mean one other thing about here too right on this little bit -- we see it in almost every industry, right? This is one of the challenges across the country, right? And in particular, someone gets that training in the rural area and you are not trying to poach them. You are just posting a job but they might want to live in Atlanta, right? A lot of people want to live in Atlanta, right? Maybe not this time of the year? But, you know, better periods, right? As a Southerner, I know what's going on right there right now, it's tough. But I am saying folks may -- all of a sudden, they are coming there, right? So all the more important to have this kind of regional institutions that operate at scale whether at state level or you know, of course for larger metropolitan areas, it should be your end. That is scale enough.

But I want to kind of before we kind of maybe go to the last federal slowly and go to federal, I want to kind of stop for a second and say, institutional architecture, sounds great. Who is paying for it? Where does the money come from for all this? This is a safe

space. You can say whatever you dream about. It doesn't necessarily mean you are.

MS. POWELL: So, I think we firmly believe that we should have some skin in the game but there has to be some support from the federal government. There has been a decline in contribution to infrastructure investment but we are talking about investing in people that are maintaining the billions of dollars of investment that we already are making on our rate payers' dime. So I think there has to be -- it has to be spread across. Each level should contribute to making sure that people have the training required to access the jobs that are there.

We are talking about, we right now have over 200 positions that are vacant. So, those are opportunities that people that are under-employed or unemployed could access if they had the training and the skills for those jobs. That means that you would see other benefits in communities reducing recidivism, you would see better pathways for children, you would see impact on economy. We talk about the impacts that our operations have on the economy. So I think that it should be a shared effort to build this infrastructure, the architectural infrastructure for workforce development and a shared responsibility to fund it.

MR. KRICUN: I agree with Kishia completely. I mean I think that -- we utilities have to have skin in the game. It's ultimately our responsibility to man our facilities, you know, resource our utilities, have people in there and meet our obligations. And then also as community service anchors, we want to do that in the most equitable way as possible. We have to pay for it but we also do need help.

I mean and I want to echo what Congressman Graves said earlier and what Kishia just said, I mean American Society of Civil Engineers gave our infrastructure water treatment plants D plus grade. Well, it's the same issue with the water infrastructure. People are part of that infrastructure. And so we have to, as Congressman Graves said, think proactively. I mean in the case of construction, he quoted it, it is clear that an emergency repair is three to five times more expensive than a proactive planned maintenance. Similarly with people, if you are putting people in a thoughtful way and doing it in a good way, the

benefits to the community are incalculable as Kishia said.

I mean, in a way I see it too is that this template is a one-off initially. Creating that architecture and providing that example one time as opposed to people just -- and reducing that learning curve for everyone else. It is a relatively low investment that will tremendous ripple effect. And then you are looking at ongoing assistance to help maintain it. But I see it as a relatively light lift. It's sort of that analogy to preventative maintenance versus an emergency repair that would have benefits that go far beyond the initial expenditure.

And then, for special cases like the PowerCorps Program where we take at-risk youth and not just hire them, but also give them life skills training and helping with the issues that made them at-risk youth to begin with. That's where a good presence like AmeriCorps should assist. But the utility, as Kishia said, has to have skin in the game too.

MR. TOMER: Right.

MS. POWELL: I would add though that the power of the report that you released is connecting what we do to the larger sector. I mean when we talk about the water sector, we are not just talking about public utilities. There is the private utilities. There are consultants and other contractors that need the same skills and skillset. So I think if we are really taking a step back and kind of building that infrastructure or that architecture rather, then we need to take a look at all of the opportunities that exist to engage every partner we can and have those, all of those partnerships contribute to this effort. Because ultimately, if we pay to train them, eventually they move on to someplace else and a lot of it is the private sector. And they are already paying for training.

MR. TOMER: Absolutely. I mean the workforce side of the equation has so much experience with kind of figuring out how to bring this all together and pay for it, right? What can the broader water -- but frankly even broader than at the infrastructure sector learn from the other sectors of the economy that have figured out how to do this at scale?

MS. SPIKER: Yeah, so, I mean one of the stats that I just find staggering is the idea that -- so Georgetown Center on Education and Workforce said that if there is this

large infrastructure package investment of a trillion dollars, that could lead to 11 million new infrastructure jobs and that just only adds to some of the crisis that you all are talking about with the aging in the workforce. And so when you are faced with that kind of crisis of how you are developing these partnerships become even more crucial.

And Georgia has actually been a leader in figuring out how to support some of these partnerships but limited funding makes it -- I don't actually think it has expanded into the water industry. But Georgia uses part of their workforce development funds for what they call the high demand career initiative which supports partnerships across the state, bringing folks together, doing the labor market analysis. And that's something that a number of states are using their state funds to help support but it is a required activity for the workforce development system. So your local workforce centers and boards are required to be supporting these partnerships under the Workforce Innovation Opportunity Act which similar to WRDA also had huge bipartisan support but has yet to see funding levels to help support that bipartisan vision.

So you mentioned the reduction in infrastructure investment, we have seen a 40 percent cut in the investment in our workforce development system since 2001. So as businesses are putting their own skin in the game, there is less kind of investment coming from the government to help support bringing all the different partners together. So Georgia has done some of that.

We have been working with Representative Fergusson from Georgia and Representative Bonamici from Oregon to -- on a Bill called Partners Act which would help fund additional partnerships really based on what Georgia has been doing. But it's that additional funding to help support that really wonky kind of weird partnership function that is difficult to communicate that can be so crucial from what it sounds like you all are talking about here.

MS. POWELL: And you have to go on a scavenger hunt to find those opportunities --

MS. POWELL: Exactly.

MR. KRICUN: Exactly.

MS. POWELL: We heard about the Quick Start Program that in Georgia as well which an airline used to help set up a training program for specialized mechanic and then they become an exporter worldwide for this specialized mechanic using that program. They basically filled a gap that they had for a specialized worker but they used that program. We knew nothing about it.

As you said, I am an engineer. I am not a HR practitioner or have been in the workforce development. So when you run a utility and you are faced with these issues, you got to get up to speed on how to handle the workforce but you also have to get up to speed on all the opportunities that exist out there. And it literally is like a scavenger hunt to find funding and programs and partnerships and put it all together so that you can meet the needs of your utility. And it shouldn't be that way.

MR. KRICUN: I agree with Kishia a 100 percent on that because -- and that's what I was saying earlier about having information in one place. Since we are working with NAQUA and EPA, they try to bring all that information into one roof. It shouldn't be a scavenger hunt. I mean our program happens to be -- we happen to be right across the river from Philadelphia. That's the only reason we heard about it. The idea is that there should be some sort of compendium of these successful practices so that people and the utilities know about it. So they can say, all right, I want to solve this problem.

So first like Kishia said, the intentionality and then second, a one-stop shop of where to go to find the solutions, and hopefully resources and funding to help implement them.

MS. SPIKER: Which ironically is what the workforce development centers are actually called as one-stop. (laughing)

MR. TOMER: Look. We had a Congressman here, right? I think it is a default for so many of us when we watch Washington federal issues to just think about Congress, right? And it's great, right? We need legislation moving. We need authorizations that then allow our agencies to do the work they want to do. I want to stay on the agency tip

for a second, right?

So you brought up -- I love the metaphor of a scavenger hunt. We feel that way when we do our own research, right? So we know the feeling. What would you like to see from the agencies that could help you all do your work better, right? Or whether it's creating a compendium of information, right? Is it boosting technical support, right? What can they offer you at that natural scale when you are -- you are right -- at that federal level, right that can help both these regional actions as well as within utilities themselves?

MR. KRICUN: I have three things to ask. One can be this compendium. The second would be the State Revolving Fund. It's so amazing. I mean we have used it in New Jersey and such great assistance from EPA and RCRA Agency but if they could without reducing the total fund, maybe add like a 5 percent kicker -- our friend (Adele Halucia) from Los Angeles had this idea, add like a 5 percent or x percent into each infrastructure grant for training in the low-interest loan. We still have to pay the loan back but it would be affordable. So let's see if it's a 50 million dollar project, add 3 percent in there for training to operate. The utility still has to pay the loan back but then you have that opportunity.

And then the third thing is some sort of, I don't know, a collaboration of EPA, Labor, and Education together because all three partners are needed to make this work. So rather than having to go over those jurisdictional boundaries, we can have them all in the same room somehow.

MS. POWELL: I would say pretty much ditto. I don't think it should be left to us to figure out who should take the lead at the federal level on making sure this happens. I think, you know, the three partners there that Andy talked about really need to work together to figure out who is the natural lead but it is going to take working across those agencies and not being silo-ed to make sure that this happens.

We have a group that we work with both Andy and I, and Ted, who is here, which we call the Water Agency Leaders Alliances. It is 17 utilities from across the country that band it together to work on water sector equity issues, workforce development being one

of them. So if we can work across the country through conference calls and other things to make sure that this issue is top of mind for folks. I think that the meeting that EPA is calling will help but there really needs to be kind of a focused discussion among them to figure out what can each of those agencies put in this equation that will help the country, all of the utilities here be able to deal with this issue a bit better.

MR. TOMER: Right. Absolutely. And we are huge, not just -- we think the summit is a great idea. We are huge supporters of the summit but the problem is the summit ends, right? How do you create the longevity there too? And we know the federal agencies have a ton of interest in more programming here too right. Katie, let's close with you at least for my questions because I can't wait to turn to the audience?

What are the other best practices that kind of broader workforce development community is looking for from federal agencies to help them do their job across the country better?

MS. SPIKER: Yeah, I think the inter-agency collaboration is certainly the foundation of it. You know, it's interesting that you mentioned that the 5 percent set aside. So currently, under the federal Highway Bill, states can use -- it's no longer limited. It used to be limited to one-half of 1 percent of their federal highway funds to help support workforce development. This is something that only a few states have actually engaged in and used. But that model is something that could really translate into other industries.

Not to go back to Congress and we are talking agencies but we are working on a -- we have been working on a Bill, been introduced in both, the Center and the House, on a bipartisan basis that would set aside under that larger infrastructure package a portion of funding based on that same model for workforce development. Senator Booker and Senator Capito have the Bill in the works that would help support grants for workforce development.

And so I think it's really that that appreciation in the work with DOL and ED to ensure that when we are talking about investments in doing this kind of infrastructure work, that we are paying attention to the fact that there is got to be folks trained to do the work.

MR. TOMER: Right. Absolutely. I have had the best job because I get to listen to everyone right up close and ask them questions. We have been able to reserve I think even more time than we had for the Congressman here to ask some questions, right? So again, let's take questions from the crowd and again, all we ask, just say who you are and your statements for the question mark.

MR. HORNE: I am Jim Horne. I am the guy that these two talked about. I just want to make clear that we are partnering with three or four other national associations to hold this convening later this year. So we want to make it as action-oriented as we possibly can and this is not a convening just of utilities necessarily. It all sounds great. It's going to be interesting to see if we can pull it off together but it is a joint exercise.

The one thing that Andy said that I want to kind of push back a little bit on, is maybe it is just for the use for the word 'template'. I am not sure there is a 'template'. I think there is a lot of space in there, Andy, to create -- and I don't want to say even a roadmap -- but basically, sort of laying out, sort of, the basic elements of what a water workforce strategy might be at the utility level. Just the basic elements and then focusing in on providing as much information as you can about practices in that particular part of the strategy that are taking place now.

We have had a lot of success collaborating with the national associations on something, sort of, on how you manage your utility as a whole. I wonder what you thought of that idea. I think that could complement sort of the practices compendium that NAQUA is working on and we will be happy to work with them as well. But I wonder what you thought of that basic idea.

MR. KRICUN: Yeah, I used 'template' as a, you know, sort of a catchall but really it is a component of several things in the toolbox. I think maybe a compendium of what's already been done, a roadmap on how to do it yourself using those as examples, and then, lastly, probably more of the template would be some sort of international training program for waste water operators, waste water repairs rather than having the community colleges to

come up with -- and work with the utilities to come up with their own curriculum. Have it already done. That maybe more of a template. So it's probably a compendium of existing practices, a roadmap of how to do it, and then, educational templates for the community schools to train the students.

MS. POWELL: Yeah. I would agree and I think Andy used the word 'playbook' as well. Because I think it's broad. But there does need to be some templating. Especially for small utilities that don't have the resources to do the research on how to pull specific programs together.

(Case employment) took us a year and some change to pull the program that we have with the Department of Corrections and the State of Georgia Department of Corrections together. There were some things that needed to be put in place first before they could actually have a program. The city's Department of Corrections had to be certified as a pre-release center with certain rules in place. And then we had this set up, how are these employees are going to be getting paid? What are we going to do with the pay while they are technically still incarcerated?

So there are those things that I think you can lay out so that someone doesn't have to take a year to put a program together but if that is a program from the playbook that will work for that particular community or utility or whatever it is, then these are the things that you need to have and put in place and make sure your Law Department reviews type of deal, yeah.

MR. TOMER: Let's go right here in the center.

MR. WRIGHT: Good afternoon, or good morning rather. Thank you for your time and appearance on this panel. My name is Amir Wright, I am a third year student at the University of California, Berkeley. So this SFPUC in Bay Works, it is very close to home for me, you know, living right in the Bay area. So my question is really about students. How can we educate the upcoming generation on, you know, that these jobs are available? And that the water workforce is somewhere, you know, where they can find their career because

students don't come up and say, I want to be a water administrator when I grow up. (laughing)

MS. POWELL: Sure.

MR. WRIGHT: So how can we --?

MR. TOMER: Please make sure they are aware of these opportunities.

MS. POWELL: I certainly didn't. (laughing) It is the furthest thing -- I wanted to be an interior designer. (laughing) My mother said no, go into engineering.

So one of the initiatives that we have is revamping our K through 12 program and San Francisco PUC has a program as well. They also have a very extensive internship program and they actually require contractors and vendors that are doing work for them to participate in some ways in their internship program. A lot of that falls to us. We have to do a better job at recruiting and what we found and the reason why we are revamping our K through 12 program is that the information about the opportunities that exist in water should start in elementary school. So we are not just targeting high school students, for those students that we know will not go on to college and we estimate about 75 percent of high school students don't actually go to college. They look for other -- especially now, they are looking for other avenues besides going to a four-year school. They may go to technical college.

So we are trying to work with the school system so that we can infuse some of the information that we have in the curriculum but also making sure that we identify the career days at these schools so that we can participate. So a lot of students, a lot of schools will ask students to bring your parent to talk about the work they do. We want to be a parent and go ourselves on career days, especially at the elementary and middle school level. And certainly with high schools, there is an opportunity for police and fire. A lot of recruits come directly from high school. We also want to be an employer of choice for high school students.

And then college level, we have a number of colleges and universities in the Atlanta area, Georgia Tech. We got some students of Georgia State University. We also got to do a better job at making sure that we identify the opportunities to engage those students in

college. This year we did a bit better job. We got over a hundred students in our internship program. We changed our internship program to be completely stem-focused and getting that information out to the colleges and universities. Instead of starting to recruit applicants in February, March, April, we started in September to give the students an opportunity, ample opportunity to really look at and apply for our internships.

MS. SPIKER: And one of the things, I think you know the partnerships with the K-12 and for the secondary systems are so important. One of the other things -- I have to keep going back to the same example but what Bay Works does is that they work with the instructors and the educators and brought them in for programs to help them train in the industry, bring them up to some of the standards that the industry is working with to help engage them to be good ambassadors back to students. So it's which another federal program, Perkins for technical education can help support some of that continuing education for instructors and for teachers to help make sure that the whole robust education and workforce system is working to support where industry actually is.

MR. KRICUN: I just want to say that, first of all, I just have to say that, you mentioned SFPUC and the Bay. I mean, San Francisco is really the connoisseur -- I just want to thank them. Kishia mentioned the Water Agency Leaders Alliance, I mean, really found very much by (Samsung) and led by (Samsung). They are the most progressive water utility. There are a lot of them but they are really our spiritual leaders in dealing with these water equity issues. So, we look to them for support and guidance. So, and Bay Works is just one of the examples and there is other utilities in the Bay area that work on that.

But second thing is that I agree very much with Kishia and Katie said it's important and especially to get not just water workforce opportunity but also we want to also create the environmentalists of the future. We want to also the water repairs of the future that they support, you know, rate increases for if necessary to bring that D plus infrastructure grade back up. So, it's important for people to understand the importance of water in their lives and also as an opportunity potentially for their careers. So, we are doing with our Green

Ambassador Program in our high schools but it definitely is an opportunity that needs to be followed up even more.

MR. TOMER: Okay. I just negotiated to squeeze one more question and so, try to be brief and I will ask the great panelists to be brief too. Let's go right up here.

MS. JOHNSON: I am Victoria Johnson, representing Global MST. Kishia, my question is for you. So, wanted to commend you on your re-entry program, how you have in Atlanta. Two questions for you. Can you talk a bit about your short-term and long-term goals for that program? I understand that it's a pilot program. And secondly, as you talk about a potential playbook as things move forward, have you had other utilities like Global MST and others around the country consult with you about your program to try to duplicate that in other cities?

MS. POWELL: Yes. Louisville MST, which this summer, they will be hosting a five-cities conference to talk about the launch of a similar initiative. So, our good friend Tony Petroy there who works with us. So, and I am glad we called it a pilot program because, you know, we have had some challenges. The number one challenge is the life skills part. The employees were doing or the trainees were doing a great job at training, they are in the classroom training. They are training to get certified and they are also doing the hands on fixing hydrants and meter leaks and other things.

But the life skills part and reverting back to old behaviors was a challenge for three of the individuals. So, they were actually pulled from the program. And we believe the six remaining trainees will be successful in the program. But one of the challenges of this is, when they leave work, they are going back to the institution. And so, they come out of their watershed uniform and they put back on their jumpsuit. And so, getting -- they are not completely out of that mindset.

We targeted for the start of the program fathers. So, that would give them that added incentive of really staying on the right track. But that is going to be -- that I would say is a challenge that has to be monitored. There are certain things that they cannot do like

take cellphones and meet with folks while they are at work. And so, I think they were very clear about the rules. But we don't have people that are working with them every day that are necessarily monitoring. We did not want to have someone from the jail do ride-alongs with them but they are able to assess and figure out, you know, something's that go on. And so, that's, kind of, the downside. But I would say we have another ten individuals that are ready. And we are going to keep -- this has been largely successful. The six that are there remaining, they are working extremely hard to turn around and we are so proud of them.

MR. TOMER: That's a great way to close. I got two things. So, first of course join me in thanking the panel for coming all this way and for your great conversation. I just also want to really quickly thank Karen Slachetka who is standing over there who always puts on tents. And thanks to all of you, not just for coming today. A lot of you in the audience are really helpful to Joe and myself, the rest of our team in the process. So, thank you for helping to make the work possible actually. So, thanks have a great day.

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