
Task Force Meeting

of

FIRST LEGISLATIVE DISTRICT ECONOMIC DEVELOPMENT TASK FORCE

“The Task Force will take testimony regarding the unmanned aviation technology industry and its potential impact on the economy of the First Legislative District and surrounding region.

The Task Force will also discuss the production of a report detailing the findings and recommendations of the Task Force”

LOCATION: Stockton University
Galloway, New Jersey

DATE: February 23, 2017
1:00 p.m.

MEMBERS OF TASK FORCE PRESENT:

Senator Jeff Van Drew, Chair
Assemblyman Bob Andrzejczak, Vice Chair
Assemblyman R. Bruce Land
Raymond M. Burke III
Vicki T. Clark
Ralph J. Cooper
Roy Foster
Carol Johnston
Barbara M. Jones
Dr. Harvey Kesselman
Dr. Richard C. Perniciaro
James F. Quinn
Dr. Yves Salomon-Fernandez



ALSO PRESENT:

Charles Buono <i>Office of Legislative Services</i> <i>Task Force Aide</i>	Eugene Lepore <i>Senate Majority</i> <i>Task Force Aide</i>
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Hearing Recorded and Transcribed by
The Office of Legislative Services, Public Information Office,
Hearing Unit, State House Annex, PO 068, Trenton, New Jersey



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COMMITTEE NOTICE

TO: MEMBERS OF THE FIRST LEGISLATIVE DISTRICT ECONOMIC
DEVELOPMENT TASK FORCE

FROM: SENATOR JEFF VAN DREW, CHAIRMAN

SUBJECT: COMMITTEE MEETING - FEBRUARY 23, 2017

The public may address comments and questions to Kevin J. Donahue, Patrick Brennan, Committee Aides, or make bill status and scheduling inquiries to Kimberly Johnson, Secretary, at (609)847-3840 or fax number (609)292-0561. Written and electronic comments, questions and testimony submitted to the committee by the public, as well as recordings and transcripts, if any, of oral testimony, are government records and will be available to the public upon request.

The First Legislative District Economic Development Task Force will meet on Thursday, February 23, 2017 at 1:00 PM in the Campus Center - Board of Trustees Room, Stockton University, 101 Vera King Farris Drive, Galloway, New Jersey 08205-9441.

The Task Force will take testimony regarding the unmanned aviation technology industry and its potential impact on the economy of the First Legislative District and surrounding region.

The Task Force will also discuss the production of a report detailing the findings and recommendations of the Task Force.

Issued 2/15/17

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SENATOR JEFF VAN DREW (Chair): Good afternoon, everyone.

It's good to see you all here.

I know there's a lot going on, so we certainly appreciate the fact that you are here.

This is our last meeting of the Task Force; this will be our -- what is this? -- our sixth meeting of the Task Force, and we have come to some conclusions. We have some interesting discussion today about unmanned aviation; which has a real future, we believe, for both Cape May County and, possibly, Cumberland County and, in general, South Jersey.

But before we get into that, the very first thing we do, as it should be -- and I'm looking for-- There's the flag. I would ask everybody to please stand and pledge allegiance to the flag.

And after that, we'll have a moment of silence. (all recite pledge)

And a moment of silence for all the Americans who have sacrificed for us throughout the years. (a moment of silence)

So as I said, we are going to go around and introduce all of the people who are here.

We'll actually start all the way at the end, down by Vicki. Just introduce who are you and where you're from.

Thank you.

MS. JONES: I'm Barbara Jones; Servpro of Cape May, and Cumberland counties.

MS. CLARK: Vicki Clark, Cape May County Chamber of Commerce.

MR. COOPER: Ralph Cooper, Upper Township Business Association.

MR. BURKE: Ray Burke, Burke Motor Group, Cape May County.

ASSEMBLYMAN LAND: Bruce Land; Assembly, First District.

ASSEMBLYMAN BOB ANDRZEJCZAK (Vice Chair): Assemblyman Bob Andrzejczak, First Legislative District.

SENATOR VAN DREW: Senator Jeff Van Drew.

MR. LEPORE (Task Force Aide): Gene Lepore, Senate Staff.

MR. BUONO (Task Force Aide): Charlie Buono, Office of Legislative Services.

DR. PERNICIARO: Richard Perniciaro, Atlantic Cape Community College.

MR. FOSTER: Roy Foster, Electrician's 351; and Chairman of the Atlantic County Improvement Authority.

DR. SALOMON-FERNANDEZ: Yves Salomon-Fernandez, President, Cumberland County College.

SENATOR VAN DREW: Okay; thank you.

And from those in the audience as well.

B O B M A R S H A L L: (off mike) Bob Marshall, with the Atlantic City Chamber.

J O S E P H D. K E L L Y: Joe Kelly, with the Greater Atlantic City Chamber.

M A R K J A C K S O N: Mark Jackson, Stockton.

SENATOR VAN DREW: Good; okay.

And I think we -- you all are going to get your chance in a little while, right?

So that's good.

Before I actually get into the subject of today's discussion and what we're going to be doing, there is something that I believe was important; and it's really, actually, been bothering me a great deal as time has gone on. And I just want to discuss it briefly.

When we speak about *economic development*, and we speak about the future and where we're going to be, obviously part of that is energy. And I know there are various viewpoints; all the viewpoints are worthy of respect when it comes to this energy issue. And speaking on behalf of myself, I certainly am supportive of renewable energy, and have been. For those who don't know -- in my own home I have a wind turbine, 120 feet high; and it's a 20 kilowatt system. I have solar panels as well. So I am somebody who believes in renewables.

I also believe that the answer to the future is not going to be purely renewables, at least in the short-term future; that we are still going to have some reliance upon fossil fuels. And that for our country and for our state it is important to be energy-independent, and energy-strong, and to use common sense.

We have this issue -- which is a First District issue -- that has come up over, and over, and over again. We've heard a great deal about it throughout the state -- and, to some degree, even throughout the country -- of the pipeline that would extend from the area of Millville through

Maurice River Township, into Beesley's Point, and into the generating station there. And many of you know -- if any of you have been listening -- that I have long been supportive of that pipeline, for a number of reasons. And I just want to, for one last final time -- because the vote is going to be tomorrow, and it's an important vote, I believe, for our future -- for public safety and public security reasons, I believe it's important; because we only have one major pipeline feeding that area, and feeding that part of Cape May County, and that part of Atlantic County. If anything happens to that, in any time, any kind of natural disaster or storm, we are certainly going to have very, very serious issues.

It is an employment issue; for those who would place the pipeline in the ground, it represents employment. For those who would convert the plant from a dirtier coal fuel-burning plant to a much, much cleaner, state-of-the-art natural gas plant, it's an important issue. It is an important issue for the people who would have jobs that are maintained there, because the plant would stay open, rather than the plant being closed.

It's important for energy independence for our entire area; and it is also noteworthy, because there just seems to be -- and I wish, quite frankly, that every media outlet was here -- there seems to be some confusion about where the pipeline is going and what the pipeline does. It is a natural gas pipeline. We all read in the media about destroying or harming the aquifer in the Pinelands. It is physically, chemically, scientifically impossible for that do that. It is natural gas. Gas rises; it can't go into the aquifer, it wouldn't go into the aquifer. If you want to have that

discussion or argument, you can try to have an argument about the safety of natural gas and what it would do. But it is not an issue with the aquifer.

There is, then, the issue that it goes through the middle of the Pines, or destroys the Pinelands, or does harm to the Pinelands. I will tell you that the average person who has a pipeline put into their home -- because we know that many people are, currently -- see all the natural gas pipelines going into people's homes -- destroy more trees, on average, than does this pipeline during its entire length. It's two to three trees that would be harmed along the length.

Thirdly, there is the discussion that it would be in the pristine Pines. The pipeline runs along the shoulder of the road. This is all factual information. I don't know how many times we've said it, but we're going to say it again. The pipeline runs along the shoulder of the road on a State highway; actually, two State highways, Route 49 and Route 50. It does not harm the Pinelands.

Another thought that's important to know is that there are currently six pipelines underneath the Pinelands, all of which were approved unanimously over the years; all of which supply energy for our area. None of which, obviously, have done any harm to the Pinelands, because we all do agree that it is a pristine, pure area.

So all of that is important to understand.

Finally, what I want to say on this issue -- what has disturbed me, most particularly, is that there is always room for disagreement, discussion, and dialogue. But we've gotten to the point, in some areas in our state and, quite frankly, in our country, where we're just completely intolerant of another viewpoint. We don't want to hear another viewpoint.

Whether it is something that is on television, and we say that we have to remove ourselves to a safe place because we're hearing an opinion that is contrary to the opinion which we believe; or whether it is because people who sit on a Commission may vote a certain way.

So I will tell you that I have spoken to a number of the Commissioners; and I know of at least two -- and this is factual -- that have been threatened, menaced, terrorized, and intimidated by people who are against this pipeline. That's inappropriate, it's unacceptable, and it's un-American. That's not the way that we deal with issues.

So I wanted to say that today because that pipeline, I believe, represents one of the major energy initiatives for the First District; we didn't really discuss it during our Task Force because, quite frankly, we thought that it would go through and it wouldn't be an issue, and actually it's become a huge issue. You would think it was the North Dakota-- By the way, the whole pipeline is 24 inches. It's almost become like it's some major trans-Atlantic pipeline that's going to be moving oil or gas across continents; and that certainly isn't the case.

So I hope, as we move forward in our country -- regardless of whether we're Republicans or Democrats, whatever we believe in, however we feel, whatever we want to do -- that we just learn to accept other people's viewpoints at times. It doesn't mean that you don't advocate and fight for what you believe in; but there's a certain way to do that, an appropriate way to do it. And it isn't to try to scare or hurt people; and I'm very serious about this. And in fact, in one case, the police had to be called.

So this is an issue that I think is important, and I thought it was important for this Task Force to hear about it.

And I appreciate the time; and we will now move on to what we also have to do.

And I also know that President Kesselman arrived; and we want to thank him for hosting us.

Where is he? I didn't even see him--

DR. KESSELMAN: I'm right by you.

SENATOR VAN DREW: Oh, okay. I was so energized--

DR. KESSELMAN: I snuck in; you were focused--

SENATOR VAN DREW: I know; I was so focused there.

Thank you for being here.

DR. KESSELMAN: Happy to be here.

Sorry I was a little late; I was in Atlantic City, working on economic development.

SENATOR VAN DREW: Okay; well, that's a good thing. I know you're doing amazing things.

And it's also pointed out to me that we have to ask all the witnesses to identify themselves, for the record, and for the transcription as well.

And with that, we are going to start our discussion of the unmanned aviation industry.

And I am actually going to ask -- I think we have room for everybody to come up, if we can even bring some extra chairs up.

And we'll start with Don Sebastian, Joseph Sheairs, Carole Mattessich, Denise Spell, David Yoel, and Nate Ernst. And they will identify who they are, where they're from, and what they're about.

I will tell you, this is an exciting prospect for our region. It's something-- What's kind of exciting about this is it's something that doesn't fit everywhere else. It's something that you can't do so easily in Hackensack, or in Bergenfield, or in Union City. It's something that really fits our region in deep South Jersey, here, that could truly bring some employment, bring some jobs, and bring a future.

So we're really happy to have you; we appreciate your time. We know that you're all very busy.

And we will start with Donald; and just identify yourself, and please begin.

D O N A L D H. S E B A S T I A N: Good afternoon, Senator, Assemblymen, and Task Force members. Thank you very much for giving focus and attention to this issue.

My name is Donald Sebastian; I am the President and CEO of the New Jersey Innovation Institute, a corporation that was created out of New Jersey Institute of Technology, where I've been since 1995. My co-title is Senior Vice President for Technology and Business Development. I have some 15 years as a Senior Vice President of Research and Development.

A few quick words about our Institute so you understand why this is something that we've embraced and, hopefully, something that you will as well.

We created this organization as a better way of achieving our University's objective -- our mission objective -- that dates back to the days of economic development. There are many different ways that universities can partake of economic development; but as a tech school, ours is really

about helping businesses grow, bringing businesses together; and recognizing both the need to move new technology out into the commercial workplace, but also figuring out how to bridge together small, medium, and large companies, and the different industry verticals, to promote growth.

And that really is our mission. We've organized ourselves around five specific industry sectors that are important to the state; and one of those is defense and homeland security. And it is under that banner that we organized our efforts in unmanned systems.

We had already been engaged in -- really, since the middle 2000s, as an attempt to see how we could use UAVs as part of the emergency response -- support for the emergency first responders, post 9/11 -- both as a mechanism for eyes-in-the-sky, but also a mechanism for providing airborne communications when ground-based systems may have been compromised.

We did the first flights, I believe, in the United States; and certainly, in New Jersey, in the civilian airspace out of the Cape May Coast Guard Center, with David Yoel's aircraft -- David there; thank you very much. And so we were in it from the technology perspective; but as we developed ourselves to broaden our mission and see not just how could we move things, as we are creating them in the University, out into making an impact in the outside world, but really better facilitate companies that are out there.

And it became clear to us that there was an opportunity here to serve a capacity to bring together all the different airframe manufacturers -- the bigs, the smalls, all sorts; from the little hobbyist UAVs -- *drones*, in the popular press, that may only spend 5 minutes up -- to much larger systems,

even approaching manned aircraft in size, that have the potential to fly extended, very long missions.

To pull them together with those who create unique sensor pathways, you need a system that can be flown on those airframes; and with those who are interested in applications, they could take advantage of this new capability. We'll talk a bit more about what some of those are.

We have a program under the Defense Department called *MarketShift*, and it's really designed to revitalize the U.S. defense manufacturing base. Our slogan is *identify, fortify, and diversify*. And in that, we've employed some techniques to bring together community, industry members, and academics to define new approaches to how we pull together and begin to form local clusters, if you will, of competencies. And out of that effort, one of the work groups was in Cape May; Carole, and Denise Spell, who will speak later, became the prominent leaders and drivers. So it began to get an extra (indiscernible); and it wasn't just about moving the technology out into play, or working with those who might want it. But really to think more deeply about how can we use this as a true economic development engine that -- across our different areas of application. One of our models, in fact, is to create large-scale demonstrations -- real-world scale demonstrations -- that allow people with ideas to show that they not only make technical sense, but they can make dollars and cents. And that for small companies, being close to the action of where their ideas are being put into play, that then attracts investors, attracts business partners, or up the food chain -- that for small companies, you want to be close to where the action is.

You may be a global company sitting in New Jersey and have operations all over the world; and that's fine. But for a small or mid-size company, they're not going to have their home office in San Diego and all their flight operations here in New Jersey.

So we thought that this is really a powerful way that we could facilitate getting these birds in the air, to then attract the companies across all those domains that I described: the airframe manufacturers, the sensor and payload manufacturers, and the people with applications who could use them.

Concurrently, there was a program that Joe really brought to New Jersey, which was a FAA designation for unmanned systems test sites. There were six awards made nationally; one of them was for a proposal -- that, again, to give credit that is often not given, but due -- Joe really provided the substance to demonstrate that the combination of Virginia, Maryland, and New Jersey -- and, in fact, it was initially Virginia and New Jersey -- had some unique attributes to the airspace -- the Cape May airspace -- that would allow us to help solve the problem that the FAA wanted to address, which was how do we safely fly and integrate unmanned systems into the national airspace.

From the stuff you see on the news of kids' toys being released accidentally -- or even, perhaps, maliciously -- into the flight paths of major airports; to really figuring out how are we going to do Amazon deliveries by drone, or how are we going to fly other sorts of missions -- that one needs to figure out how that's going to be managed and integrated into the manned space. And the mission of the centers, then, was to have the ability to grant permission for people to fly in national airspace or, in fact, provide the

preflight safety checks to know that the equipment really should be up there to begin with; and, in the end, to provide the data that demonstrates that they can reliably be flown; that they are where they say they are, and they come back to where they should come back to, even if they lost radio contact; and many other aspects of flight operations.

The award was initially to universities -- so Virginia Tech, the University of Maryland, and Rutgers University. After a couple of years of trying to get it off the ground, it really didn't fit into Rutgers' research portfolio, and it really wasn't supposed to be an academic research mission to begin with. And so there we were: New Jersey Innovation Institute was designed to be a bridge across all of the states' universities and interface in the applied world. It's not about merchandising academic research, or trying to conduct under a different umbrella; but really do the things that are the gap that exists between where universities dare to go, and practicality, and where industry dares to go in terms of this. And there's a big gulf in there.

The Defense Department has something called *Technology Readiness Levels*, from 1 to 9, that talk about an idea in the laboratory at Stage 1; and something that is ready to go out the door in production at Stage 9. And what we see repeatedly is that universities may go to 3, and need a massive stretch; and industry may go to 8, from 9; but who does the practical stuff in between? And that's why we were formed.

So we have Rutgers on our Board; we have Rowan on my Board of Directors. And they mutually agree that, why don't we steer this thing, and let NJI be the interface that would create and set up, in New Jersey, an unmanned systems test site. And so we assumed that responsibility just a

little over a year ago; and have been conducting flight operations, with a focus on bringing attention and flights to Cape May.

And so rather than talk about it, if you don't mind flipping around for just a quick two-minute video. I put together some vignettes of some of the flights that we've done in recent times to give you an idea of some of those operations.

If you could roll that beautiful B footage, that would be great.

(video plays; the video can be viewed at

<https://www.youtube.com/watch?v=0CASkubBE8o>)

That's an example of counter-drone technology; safely taking down a rogue drone.

Oh, we lost the back end; that's okay.

So there was one other piece that was showing the work that we're doing, right now -- in Warren County, with the Mosquito Control Commission -- in which we're using drones to fly over difficult-to-access areas, identifying the stagnant areas with stagnant pools; or even potential technologies that could identify whether there were larva on the surface and then, having done that, to be able to use the drones to deliver the counter-Zika virus or counter-mosquito measures. So it really improves, then, the ability for a limited workforce to be able to extend their reach and their grab.

So we can certainly probe deeper into any one of those applications; but it's to show you that there's a great diversity of things that one can do that's really only limited by our imagination, well beyond

putting drones up to peer in your neighbor's windows; or some more obvious ones that are in the press all the time. Much of what you saw there are examples of first-ever applications; and we think that that's the kind of thing that we can do to bring attention and attraction to this location, to make New Jersey and make Cape May, in particular, the hub for an emerging UAV industry.

We're beginning to pitch the idea, in fact, that we can take KWWD and transform it to be the unmanned airport of the future. I mean, a place where we can integrate not just unmanned aerial vehicles, but ground service vehicles and other elements of robotics with manned operations, to really see how do we profitably make these things operate together; how do we sync to make them operate together; and how do we learn to coexist. Because, you know what? It's going to happen, whether we like it to not. These things are going to happen; and it's much better for us to be in front of that curve and make the pathway safe and use them productively. And while we're doing that, why not make us the place where, in fact, people come and have their problem solved?

So our long-term mission, or our vision, again, is to bring together the elements of this industry -- which are the, sort of, disparate parts of: the people who make things that fly, the people who make things that sit in the things that fly, and the people who need to put those things together and solve problems. And our role is to integrate, facilitate, and demonstrate; and be able to be then-- If we are successful, it becomes a business attraction; strategy that makes, if you will, this place the potential Silicon Valley of the UAV industry.

And it also stimulates the other related activities, like education, so that you need a workforce development initiative to go hand-in-glove with your technology development initiative. And I know that our community college partners down here are very anxious to see what we can do to build and to drive this.

So none of this happens by itself, you know. I'm accustomed to bootstrapping things up; I have my whole life, and I've done it with NJII. We took it from nothing to a \$60 million-a-year funded program in two years. But this is what we're going to need to figure out -- how to put some money into bricks-and-mortar; improve facilities, and equipment, and so on. We're going to pursue Federal initiatives; but to the extent that we can make public investment in this area, then we don't have to put that on the backs of the services that we try to provide to the companies, as a way of making it easier and more attractive for them to come in and fly here. The FAA, in some cases, makes it easier for them to get up in the air; but not necessarily with all the support services and the collection of outcomes that we can provide for an opportunity like this.

So I think I've said all I need to say, and I could say it three times over more. And I've taken up a lot of air, because that's what university folks like to do.

But I'll stop there and entertain any questions.

SENATOR VAN DREW: Thank you.

Elected officials like to do that as well. (laughter)

I think what we're going to do is go through the whole panel--

MR. SEBASTIAN: Sure.

SENATOR VAN DREW: --and then any questions for everybody, everybody can ask.

So Joseph--

J O S E P H M. S H E A I R S, Jr.: I'm Joseph Sheairs; I'm happy that my boss is here. (laughter)

I am the Executive Director of the Stockton Aviation Research and Technology Park. I've been associated with this Park since 2009; not working full-time, but certainly part of it.

And the reason I bring that up is because, in 2009, we had actually designed a UAS Integration Lab for the Research Park. And back then, I'm not even-- I know I didn't know Dave; but we were not even sure what a *UAS* was. But we knew -- from all of the strategic planning and what the FAA was doing -- that this was going to be a key component in the future.

So as the Director of the Park, I immediately, under the leadership of Frank LoBiondo, took the lead for the State of New Jersey in creating a UAS industry. Now, I say that -- I say that from the public side; I don't say that from the private side. What we were doing was -- as Don very clearly explained -- we were trying to become a UAS test site, as designated by the FAA. And we were successful in doing that; in fact, at our debrief, the FAA pointed out that New Jersey -- as part of Virginia Tech and the State of Virginia -- had the number one solution of all the test sites that were awarded the designation.

And so when we got into, "Well, why is that? Why New Jersey?" there were, basically, four criteria established as part of that evaluation. One was geography; we have mountains in the northwest, we

have shores at Cape May. The other one was weather; we have all four seasons in New Jersey. Probably the two key issues that resulted in our award were the aviation infrastructure that resides in New Jersey, with the airports -- the FAA airports, the FAA-towered airports. You know, when we talk about that, in our airspace we have JFK, LaGuardia, and Newark, Atlantic City, Philadelphia, Dover. And then you add all the other airports -- which are not FAA; where the FAA is not present -- and the aviation infrastructure that we have is fantastic.

Which gives us the ability to create all these scenarios in which to fly these aircraft; but not fly them remotely in the desert of Nevada. We can fly them from Cape May to Millville, when I have aircraft at 21,000 feet going into Philly. And that's what makes it real serious.

The other side of that is-- In my career, I started with the FAA -- not as an employee, but as supporting the FAA from an engineering point of view -- in 1984. So I've been around here a long, long time. My focus has always been the National Airspace System. So when you talk to others on the panel and others in this industry, they're concerned about their aircraft, its capabilities. My focus is always the integration of these aircraft into NAS.

When we went to a debrief of all the UAS test site bidders -- and this was before the award was made -- everybody kind of patted me on the back and said, "Nice try, but there's no way you'll ever win." Because, "Who wants to fly in New Jersey?" and, "What do you have? And oh, by the way, I heard you proposed Atlantic City International as one of your test sites. Are you nuts?"

And the FAA told me, “One of the reasons you won is because you proposed Atlantic City. We don’t want to fly these things in the desert. We want to fly them in the National Airspace.” Which, you know, to Dave’s credit -- and the reason why we really enjoyed working with Dave -- is his aircraft was flying at 6,500 feet; he wasn’t flying at 100 feet. He was flying at 6,500 feet; and the whole time we’re talking to Atlantic City approach in Atlantic City; I’m talking to the Philadelphia Flight Standards District Office. And you know, we really feel like we’re part of the system, and that’s what really made a difference for us.

And really, the bottom line there is, that’s because we’re in New Jersey -- because we can find those scenarios; we can find those environments which will allow us to help make a difference.

One of my biggest focuses in everything I do -- and we’ve made visits to Atlantic City, to the tower at Atlantic City Airport -- is we want to see what these things look like on that air traffic controller’s scope. So we make sure when we fly, when we’re up in there-- Dave’s aircraft has a transponder; we call the tower and say, “Can we get a beacon code?” which is a number we set our transponder to. And so the whole time we’re flying, these guys from Atlantic City are calling on the phone, saying, “Are you guys at 841 feet?” And I say, “Yes, probably.” I say, “Why?” And he says, “Because I see you on my scope, and it says you’re at 841 feet.”

So, you know, for us in New Jersey, it’s exciting, because we’re actually part of the operational system. I’ve actually, with Dave’s-- To his credit, he provides me what we call *telemetry data* off of his aircraft. And the telemetry data coming off of his Flight Management System can be 93 fields. It’s roughly-- In one flight he did -- it was three-and-a-half hours;

210 nautical miles; I believe there were about 70,000 records in the Flight Management System of telemetry data. And oh, by the way, his plane burned less than three gallons of unleaded gas. And that gas was from Wawa, because I personally went and got it. (laughter)

So, you know, when you start seeing these benefits-- So what I did is, I had my Operations Specialist -- who happens to be sitting behind me; who is my son, by the way -- I had him take that data, reduce it, put it on a map; and the results were amazing. And even when I showed it to the FAA, all of a sudden they're putting on my coat, saying, "You need to come to Washington and teach us how you did that." Of course, I said, "Well, I have to bring my friend Dave with me, because it's his plane. And he has the guys who really understand what's going on." Because I don't usually say this, but when I asked the FAA for their radar data for that same flight, it went like this. (indicates) It didn't match up. And, you know, for those of us who have worked this industry, that can be scary. But as it turned out, we were able to resolve the problem.

But the bottom line is, the only way we can learn and safely integrate these aircraft -- the big ones -- is to do all this testing. And in New Jersey, we have the perfect environment to do that.

We talk about the economy; again, I always talk about the integration of these into NAS. In 1982, I started an engineering company of one; in 2004, I had 210 people. I had a long, sustainable -- I had a large sustainable company of engineering professionals at the tech center, and I had 100 people in Washington. It was a great thing. If I hadn't had a heart attack, I'd still be doing it.

But the point is, my opinion -- the long-term, economic potential here is in engineering services supporting the National Airspace System. Because there are literally a thousand systems, or a thousand subsystems, that are part of NAS. Most of these systems are going to need modification, upgrading, testing, everything, in order to integrate these aircraft into the National Airspace. Most people, they ask me, "Well, what is NAS?" because they just, kind of, "Oh, that's NAS. It's the airspace above us." NAS is made up of thousands of systems and tens of thousands of people that keep aircraft away from each other, every single day. And it's our job -- I believe it's my job to make sure that anything we do in this environment is adequately and exactly projected onto an air traffic controller's scope so they can make the right decisions.

But at the same time, this industry is changing. When we started this road a long time ago, I think we really believed that, maybe, the test site was a long-term, sustainable, economic project. But what the FAA did is they continually minimized our value by adding rules that just allow people to do what they want. When it first came out, if you were not a public entity -- if you were a private entity, you had to go to a test site and fly. Congress put in a rule called Section 333 of the FAA Authorization Bill, which said, "Give private industry a path to flight while we develop the rule for that size aircraft."

Well, then the rule came out; and now this is called Part 107. Now anybody can go fly, if you pass the test.

I've had people tell me that the day the test came out, they did not study -- they're not pilots; they don't know anything -- it went online, they took the test -- multiple choice -- passed it. And to me, that's a scary

thought; because now you have people who have a little card in their wallet that says they can do this. They're not trained; most likely, they don't have any liability insurance; they might not even know what they're doing. Especially when some of the rules say you can't fly five miles from an airport. And so they, kind of, go, "Oh, I don't think I'm five miles from the airport."

Or, to me, aviation is an exact science, but we've opened the doors to allow people to, pretty much, operate inside of that without it being exact. And the problem being -- or the reality being, right now, is nothing bad has happened. I mean, and when I'm talking about *bad*, I mean something seriously bad; and hopefully, it doesn't.

So what I'm doing now as part of the test site -- we're focusing on the engineering stuff. We've done several projects; many projects at Cape May; we've done many projects across the country. In fact, right now, Princeton is asking us to help them fly in France. So we're trying to figure out the regulatory framework in France, and then figure out how to get them to be able to fly in France.

We've had the Red Cross come to us and say, "We have to go -- we're part of this *Missing Maps* program; so we need to go create aerial maps of Liberia. So can you teach us how to fly; and we're leaving in two weeks."

Well, the next week, a conflict breaks out in Liberia; so now they can't go, because there's a war going on there.

So we have all of these situations where it's kind of hit-and-miss. So what I've decided to do -- at least, recently -- is to create a sector of our test facility -- I don't call it a *test site* anymore; we're no longer aligned with Virginia Tech. The business model that Virginia Tech put forth was

not something that the Governor of our State would allow us to comply with, so we had to back out. We didn't really have a choice.

So as part of what we're doing now, we've become aligned with many, many private companies that have come to us, saying, "Look, I'm a representative of the largest drone maker on the planet; and I'm authorized to sell my aircraft in 24 states in the United States. And oh, by the way, I'm in New Jersey." And so, I talked to him today, because we've been talking to him at least once a week about setting up-- He doesn't just want to sell an airplane; he wants to make sure the guy can fly it, and that they can do it safely. Enterprise equipment is technically for more public or high-end-type applications. You don't just want to sell a guy one, and say, "Oh, yeah, go around that windfarm in Atlantic City." So he's looking at establishing a training facility; he calls it a *repair and maintenance facility*. He's looking at a system upgrade facility where they upgrade the software. So, you know, we're talking a real, real big operation. And he and I, today, discussed Atlantic County, Cape May County; how can we do this.

A lot of the attention that I get is because of the Research Park. And so when they look at the Research Park, immediately they look at the map, and they say, "Wow, the FAA is right there. Look at the airport there." So I think, you know, in southern New Jersey we really have an advantage.

As Don said, probably the disadvantage we have is we haven't had the financing or the funding to be able to create the organization we need to. Many of the people who I work with -- they're volunteers. The first time we flew -- we flew Dave at Cape May, we had four volunteers on

the tarmac who were all highly seasoned pilots, who loved what they were doing, came there to help out.

But those situations -- when you talk about economic growth, you're not going to create sustained economic growth unless you really make the investment to do so.

Thank you.

SENATOR VAN DREW: Thank you.

David.

D A V I D Y O E L: Thank you for the opportunity to be here.

My name is David Yoel; I'm the Founder and CEO of American Aerospace Technologies, Inc., currently located in Conshohocken, Pennsylvania.

We build sensors, analytics, and long-endurance aircraft for oil and gas, electric utilities, telecom, and disaster response.

Our systems provide real-time alerts in imagery, to improve the way pipelines and powerlines are monitored to increase their safety, resiliency, and to reduce the threat to the environment.

We've been working with the oil and gas sector on pipeline integrity management for six years now. And appropriate to your comments earlier, I would just say that, in my experience, the pipeline industry is extremely conscious of and very, very forward-leaning in finding ways to improve safety and integrity. And so that has certainly been my experience.

So along with improving integrity management of pipeline and powerline corridors, our systems also can carry -- as you saw in the video -- airborne LTE to replace cell towers in the aftermath of a disaster, where cell

towers may be out due to power outages and flooding, such as after Hurricane Sandy. And we're continuing to do research in that area to test and evaluate the use of these systems in that application, with the hope that we can increase the safety and the effectiveness of first responders in post-disaster environments.

So we're a small business, and we've been developing these capabilities since 2010. I have to say, like Joe, that not in my least optimistic moment did I imagine that, in 2017, we'd still be looking at a doctrine of rules for the operation of these systems as being something happening in the future. It's taking a long time, for good reasons; because safety of the flying public and safety of the underlying public is the FAA's first mission. But we really would like to see increased emphasis on the development of the technology and regulations for the flight of these long-endurance, unmanned aircraft systems in the national airspace.

Let me explain what I mean by *long-endurance unmanned aircraft systems*. These are aircraft that can fly for 12 to 16 hours; they can fly long distances technically, but not legally yet, without very special approvals. And the new rules that were recently released by the FAA, in August 2016 -- under Part 107, like Joe mentioned -- allow for the flight of small electric drones -- small drones below 400 feet within the sight of the pilot. And there are many, many benefits and applications for the use of these unmanned -- these small electric drones, as you'll hear from some of my colleagues today. Inspecting cell towers and electric transmission towers; you know, every year, something like 70 tower inspectors die by climbing these -- just the cell towers, to do inspections. Easily done with small electric drones, more efficiently, and much more safely.

Pipeline patrol is currently done with manned aircraft flying at low altitudes so that the pilot can look out the window and see the threats to the integrity of the pipeline, so that he can then land and report on any issues that are uncovered.

Long endurance unmanned aircraft -- this system is required because of their range and endurance to be able to do that task, and they can do it without putting a pilot at risk.

And so there are some great benefits to these technologies. I think that we're still in the early days of the era of civil unmanned aviation. We've just started scratching the surface.

I would put it as an analogy to the PC revolution in 1978. It was still an idea; there was an enthusiastic, loyal band of entrepreneurs in small businesses trying to forge a future; as well as large companies, like Xerox, that were developing the technologies as well.

Today we have the convergence of low-cost aircraft, high-performance computing, advanced sensors, advanced communications technologies, cloud, and Big Data. It all comes together to make this possible, and to make it a technology of the future.

So we see that the small electric drones have huge value; but the true value -- the majority of the value, in my opinion, will come when long-endurance unmanned aircraft systems are allowed to fly in the national airspace. We have some technical challenges to solve before those regulations can be developed; and Cape May County and New Jersey are ideal locations to do that testing.

When we started out in 2010 -- our first flight campaigns -- we literally had to drive to the remotest parts of New Mexico and Texas to find

airspace that was allowable for operation of these aircraft systems. So it was after Hurricane Irene -- when we had flown our then-current drone sensor package on the coastlines of South Jersey to learn how to collect that imagery and learn how to disseminate it to first responders -- that we found the abandoned helicopter runway at the Cape May Training Center -- the Coast Guard Training Center. And at that time, we worked with NJIT to develop the airspace and get it approved. That took a couple of years. But it was the first time that we were able to fly in New Jersey; I think we finally flew, for the first time, in 2014, I think it was.

MR. SEBASTIAN: About this time of the year.

MR. YOEL: Yes, about this time of the year; it was late January 2014. And so since then, we've had the privilege of working not only with NJIT, but Rutgers, Virginia Tech, Princeton on sensor development under National Science Foundation contracts; and, more recently, with NJII -- and they've been a great partner and friend in developing this industry here in New Jersey.

A couple of comments about the reasons why we see Cape May County as an ideal location for the development of this technology. First of all, the local population density allows for the safe operation of these aircraft without having to fly over high-population environments. And the only way to have a perfectly safe aircraft that never, ever fails is to never take off, okay? So you have to identify your risks; you have to manage your risks; mitigate them. And first comes the safety of the flying public and the underlying public, as I said.

So Cape May County provides that low-population density environment, with access to the oceans and the Delaware Bay; it allows for

the use of an airport; and the development of a wide range of applications. And this is really critical, because once we learn how to fly the aircraft -- well, that's fine; but people want to pay for the data that comes from these aircraft. They're not particularly interested in us flying; that's nice, but they're interested in the data, in the output of these systems. And the output has to be more efficiently delivered; more effectively delivered; it has to be faster, better, and cheaper to win the market in the modern era.

So we're working on the end-to-end technology solution; from sensors and analytics, to communications and aircraft, to cloud and data delivery. And that, we think, is what's going to be required to have a solution that's going to gain economic acceptance in the industry.

So along with the ability to test a wide range of applications, the proximity to the FAA Tech Center is a huge benefit, because I think it's going to help us to test and evaluate the technologies required to drive these rules forward. We need-- We can't have a 10-year program to develop these rules, because otherwise the technology will be developed in other parts of the world, and we'll just end up having to buy it from the Chinese or the Europeans.

And so we need to keep the pressure on; we need to keep the momentum going. And it's a great challenge, in this day and age, because industry-- Nobody wants to be first; as a matter of fact, nobody wants to be second. Everybody wants to be third; they want it to be proven before they adopt it.

And so we have a big task on our hands to not only do the test and evaluation, but to operationalize these technologies. And that takes

repeated flight, repeated operations, and that's not inexpensive or easy to accomplish.

So the openness of the County -- both from the government side at the airport and the people in the five flight campaigns we've conducted, now, working with others in New Jersey -- has been terrific. And we found it to be an ideal location for our development; and so we hope to establish a permanent presence in South Jersey, in the near future. And we think it's-- New Jersey has the opportunity to become a real hub for innovation, and for manufacturing, and development of these technologies. It's still early days in this industry; but you have to recognize, too, that states like New York, you may be aware, just announced a \$30 million investment in unmanned aircraft system technology development; and North Dakota, New Mexico, Texas have all made significant investments.

And no competition, no market. So there's a competition because there's an emergent technology which could bring enormous value to the State of New Jersey; and then, hopefully, to those who helped to create it.

Thank you.

SENATOR VAN DREW: Thank you very much.

Carole.

C A R O L E M. M A T T E S S I C H, Esq.: Thanks, Senator

And thank you for inviting us to talk about this important topic to both the Chairman, and the Committee, and all the Task Force members. We really appreciate the opportunity to be here to tell you about

the promise that we think UAS holds for Cape May County, and our region and state.

As you know-- Some of these things that I'm about to say, I think I'll be preaching to the choir; but they're probably worth getting on your record, very briefly.

As you know, Cape May County is truly South Jersey; we are at the very end of the state, sometimes called the *end of the world*. And that's a great thing if you're looking for a wonderful vacation or a spot to rest; but it presents challenges with economic development. And they're worth thinking about, as you think about, "Well, how does this industry interplay with this particular geographical area?"

The County's unemployment rate is very low during the summers, because we are a resort area. It spikes in the winters. I have attached, to your copy of my comments, a compilation by your own Dr. Rich Perniciaro -- he did it yesterday -- of the most recent year-over-year unemployment figures. And, hopefully, those will be taken into account in the determinations that you make as to what the State should do for this promising new industry.

Seasonal jobs are just that; they're available only during particular months, and they're rarely high-paying. I know the Task Force has already considered this as a relevant demographic in your considerations, because I saw your draft findings. So, as I say, I know I'm preaching a bit to the choir; but speaking as the Economic Development Director for the County -- one of the counties that is being considered in your deliberations -- I wanted to really try to bring that point home.

And Senator Van Drew, as your home District, you know well what challenges we face during the year, as these statistics go up and down and our people find themselves without jobs.

Housing prices, in the meantime, during the years that we have seen rises in unemployment rates, have gone up. As the second home buyer has come into the County, and -- comes in with a spending power that frequently far exceeds that of the typical resident in Cape May County. As those housing prices go up and as jobs become unavailable during winter months, our residents take a, kind of, double hit. They're left without work during important parts of the year; and they are in situations where it's very difficult to conceive how realistically to afford living in the County, and how to afford raising a family there.

The sum is, we're losing our young people. And that's probably the worst impact of all -- of the economic factors and geographic factors that combine to put the County where we are from an economic development standpoint. Kids don't come back after graduation because they can't get year-round, high-paying jobs.

We are looking to drones to help change that entire picture. Several years ago, under the leadership of Freeholder Will Morey, as we were looking at various industries and thinking about, "Well, what are we constrained from serving, and what might we be able to help host?" we started hearing wonderful projections -- economic impact projections about the UAS field. AUVSI, A-U-V-S-I -- which is the largest trade association serving drone enthusiasts and the business -- had an economic impact analysis, back in 2013, projecting that \$82 billion -- an impact of \$82 billion in the first 10 years, after what these gentlemen had been referring

to as *integration*. That means permission by the FAA for commercial companies to start using national airspace.

That projection was one of the reasons that we started looking into the industry; and it actually has proved conservative. In more recent months, PricewaterhouseCoopers, PwC, has come out with projections suggesting that the global market -- currently, the global, addressable market is at \$187 billion; and had some very rosy statements about the proportion of that market that they expect the domestic scene to serve after integration.

Indeed, even before the FAA has approved use of -- massive use of the airspace by commercial drones, there has been the development -- that David talked with you about -- which is this slow recognition and permission to the small UASs to start flying. And those operations have already started generating healthy revenues for the areas that do serve drones.

We looked at this first projection and, now, the reality of exponential industry growth; and also the functional promise of this incredible technology that we believe is going to be like the Internet for our children and our grandchildren. It's going to be the standard within 20 or 30 years. And we also looked at the practical reasons why this industry might work in Cape May County; I mentioned some of them before.

I want to mention, also, that you know how we treasure our natural environment. We saw drones as a way to bring in an industry that wouldn't have a serious negative impact on that environment. We saw it as an industry that would bring high-paying, STEM-oriented jobs into the County.

And as David touched upon in his testimony, we found ourselves in this very ironic and wonderful position of finally having geographic and other features that appealed to an industry that previously had turned off industries. For example, being surrounded by water and consisting of 50 percent wetlands have always prevented us from romancing industries like Amazon, which could bring in, maybe, a large fulfillment center to serve South Jersey. They're not coming to an area that doesn't have the type of developable terrain that other counties further north have.

The drone companies -- when they looked at Cape May, and they said, "Aha; at least half of it is areas where we can fly our drones and do our R & D without hurting people or buildings underneath," they just loved us.

So we started, way back when; and we started going to conferences all around the country and networking. We met key players in the industry. We also reached out to educational institutions -- like NJIT and NJI, as Don has related to you; we've had some really wonderful working partnerships with those groups. Rutgers as well -- from the beginning, when they took a more active role in the test site; to the present, when they're doing more of their own kind of innovative experimentation with drones. They have, for instance, a drone that now both flies and goes underwater, which could have tremendous applications, especially to seaside communities. We work with educational institutions whenever we can.

The last feature I'll mention about Cape May County and southern Jersey, that we have found companies tremendously excited about, is that our lifestyle is something that most people really love; and yet, we are equidistant to three major metropolitan areas. These folks can travel to

Philadelphia, Washington D.C., or New York City -- in one daytrip and back -- for a visit with a major client; and come back to lovely Cape May County, or its immediate environment, and have a good family life as well. So it's kind of been win-win-win all along.

I should mention that along with educational partners who we really treasure, we encouraged -- successfully encouraged Delaware River and Bay also to join in on some of our activities. DRBA manages our Cape May County Airport, so that was a very necessary and important relationship to make sure that we nourished and stoked. And they have been onboard with us, with the various things that we've been doing at the airport.

We adopted a very action-oriented agenda on the theory that if you build it, they will come. We call it *running the tractor back and forth in the sand*; if you do it often enough, you're going to upturn something that's valuable, and you're going to get some companies to take notice.

And in fact, that is exactly what has happened. One of the things that we've done -- that has been really, not only valuable, incredibly, from a business standpoint, but fun for us, has been our monthly Innovation Forum. Every month we have a forum that we originally patterned on what we considered to be the Silicon Valley model, where innovators come in and we give them the opportunity to chat with one another for four or five hours. We serve them lunch; we say, "Let's everybody do self-introductions, and you tell us what you're doing." We get people from as far away as Connecticut coming in, once a month, to Cape May County, to do this.

The group always varies; I have a core group of over 250 innovators -- drone-oriented innovators now who come in, but never at the same time. The group is always about 35 or 40 people. And the reason that not everybody comes every month is a really good one. These innovators -- many of whom are millennials -- frequently hold two or three jobs. They are brilliant, but they've done startups that have not yet been permitted to do business that generates revenues. So they have very little time.

They love to come and talk with their fellow innovators; but I will see different people come every second month or every third month. And it's just kind of a poignant reminder that everybody in this game -- this very serious game -- is really trying to not only make their bones in the industry, but literally survive financially. And I hope you'll hear that from the innovators who do speak.

Senator, I wanted to compliment you, especially-- When your staff -- Eugene called last week to confirm details with me, I asked him who was testifying. And my colleagues who have testified -- we all have been in this for quite a while. But I noticed that there were not innovators who are -- who have that kind of start-up company knowledge and activity right now. And to your great credit, when I suggested that they're really the ones who can give you the best evidentiary support for the decisions that you want to make, you invited David, you invited Denise, you invited Nate -- all of whom are really well-respected innovators who happen to share our space and our lives down in Cape May County. We've been very, very pleased to see them. But I offer them as kind of -- not only for their own innate value, but they're also examples of this Innovation Forum that I'm

telling you about. They come together, they talk about the most recent things they've been doing with UAS technology. It's always interesting, always exciting; and it helps these innovators and companies start taking root. In a second, you're going to learn just how much root some of them have started taking.

Let me just, real briefly, also -- before I do that -- run through for you a couple of the other activities in which we've engaged.

With NJIT and Cape May County Technical High School, we've held Drone camps for middle schoolers. It's a way to get STEM-oriented students learning about and interested in drones.

We were, as David mentioned, the first public airport to send up long-endurance flights in the State of New Jersey.

We had an event that involved the United Nations; you saw a taste of that on the screen, and Denise is going to tell you a little bit more about that during her presentation.

We have also done extensive work with first responders. A year ago, in Cape May, we held what we called a *user conference*. We took our innovators from this Innovation Forum group and we said, "Let's invite all the OEM units from throughout New Jersey." Marty Pagliughi, our own County OEM Director, extended an invitation to all of the Directors and Deputy Directors of the 21 New Jersey counties. They came down to Cape May County with their staffs; they were all in varying states of knowledge about drones; some of them -- Bergen County -- the leader. They had already purchased five drones and operated their fleet; they had already found a missing person in the woods with a drone; had already used a drone to help put out a major electrical fire in an electrical substation.

Other counties -- when I talked with them about whether they were sending people and how many -- would say to me, "Oh, we've been appropriated funds; and we don't know how to begin."

So this user conference put together the innovators with one of the few segments in the country right now that is actually able to purchase drones and services. And it was tremendously useful, because it gave our innovators some opportunities to make a little -- to get some relationships going and make a little money. And it gave all of the OEM units in the New Jersey the opportunity to really start learning seriously about the promise of drones in first responder situations.

Last fall, we hosted the flight campaign that you saw a bit of during Don's video; and David was the operator of the drone in that. Verizon came in; that exercise was done for first responders. We actually had a team of different State and Federal agencies that came in and did a tabletop first, and then they participated in the exercise; the whole idea being, a lot of these first responders -- when they face an emergency situation where cell coverage is knocked out -- can't get into-- They have no situational awareness, and they can't get into the place where the emergency has happened, or is happening, because of the high risk of losing more lives, property, whatever.

Drones can go in; drones can do this. One of the ways that they can help is to restore cell phone coverage when that has been dropped. I don't know if any of you remember, but after Sandy there were communities a little further north from us that didn't have cell coverage for how long -- like, 10 days.

UNIDENTIFIED MEMBER OF AUDIENCE: Yes.

MS. MATTESSICH: Okay. For first responders in the critical hours, during and immediately after an emergency, that is huge.

So drones, actually-- We have -- we proved, at Cape May County Airport, last October, they can actually be sent up as soon as the winds die down, like, enough; let's say, if the emergency is a hurricane, they can be immediately deployed and restore cell coverage to enable the first responders, and all of their very sensitive headquarters, to communicate with one another and let people know where it's now safe to go in and try to find people who may be hurt, or do your damage assessment, whatever.

We're actually, currently, in the middle of developing yet another OEM exercise that's going to occur in March and April. David will be flying that again with his RS-20, which is a fixed-wing drone. And we have buy-in from the State Police; we just got that yesterday. They said they want to be a major partner in that exercise. We had buy-in from the Coast Guard, and a couple of other really major first responder agencies.

All of which is happening here; it's happening in our area, and developing, I think, a great basic reputation for us as a place that is drone-friendly.

You'll be hearing from the innovators about a few more details.

One more thing that we're currently doing is with Atlantic County Community College. We are just exploring the development of an Entrepreneurial Institute, which will serve a number of industries, drones chief among them. In May, we're going to actually be hosting what we call an all-day *pitch conference*, where we're bringing our innovators who are interested in this service in, and they're going to learn a bit about doing funding pitches to try to, again, help them with their funding issues. The

College will offer expert services on preparing the business plan, the funders request, as well as honing their public speaking.

So we have primed the pump; and I have gone through that whole list -- not to be self-congratulatory; but to, kind of, say we have set up a lot of activities, and we have had more than tiny bites. We have people coming here; they want to be here; and now we need to figure out what kind of incentives can we offer to keep them here -- to really have them settle and establish roots.

This is an early market; and that is, perhaps, the most important business factor -- other than human factor -- that I can cite to you. In an early market, you always take advantage of first mover advantage. It's the time when you have the opportunity to take new startup companies and make them comfortable with the notion of growing roots in the place where you plant them. And this is, of course, all a cooperative effort. We are developing friendships, even as we go forward, and cultivate these companies and visitors as business relationships. We've been tremendously lucky to have all this.

I've got to be very frank with you; New Jersey is behind the eight ball on this. We are way behind other states that identified this same promise. Not all states did; but the seven or eight states that were-- When we talk about *test site states*, what we mean is, way back in 2013, Congress announced a competition for who could possibly become a test site state, as Joe explained. Thirty-six states entered the competition; six test sites were awarded. We happen to be in one of them. As Joe mentioned, we were a test site that had a conglomeration of three different states, not just one.

So I look at those test sites states as the states to compare our progress. They were the ones that got the early lead, by congressional designation as a test site. Again, just to be frank -- because that's what you need on your record -- we definitely are last, at this point, in terms of what we have done as a state to cultivate that lead and to really bring in people who have a business reason for being here and, frequently, a natural reason to want to be here.

So we are so proud of you, and so pleased that your Committee, Senator, has really focused attention on this. It's the right time; it is so the right place that you will, hopefully, really, really fly high with this. We have to be vigilant.

I'd like to make two recommendations, in closing. They're very easy; well, easy to state. I don't know how easy they actually are to implement.

One is, if possible, it would be wonderful if you could consider a recommendation that would make the establishment of the growth of the UAS industry in New Jersey an economic priority for the State, as is occasionally done with respect to different sectors or industry segments.

If we persuade you today that we actually have the test bed set up for you, I would love to see that brought back to your colleagues, and a lot of attention, a lot of eyes, focused on this.

And number two, we would have to support that goal with very substantial and varied economic incentives for businesses that, of course, want to locate in Cape May County, but also Atlantic County and other environs.

SENATOR VAN DREW: And Cumberland.

MS. MATTESSICH: Senator, if one-- I'm sorry? I have one housekeeping measure.

Eddie Obropta, who is a Middle Township boy, fellow -- young man now. He grew up in Middle Township; went through the Middle Township school system; went onto MIT; won the MIT Student Challenge -- he won \$100,000 for building a drone.

He couldn't be here with us today; but he has helped us so much in planning, and will ultimately be coming back here. He asked for permission to put in a letter. So I have included that with our written materials, and would ask your indulgence in simply taking that, although he is not present.

SENATOR VAN DREW: Absolutely.

MS. MATTESSICH: And now, if you don't mind, we have a couple of real short videos; would that be okay? One of them is of Denise's company at the airport, what they're doing; and the other we probably could not -- we have a longer version of the Verizon video, so I leave that up to you. It might be nice before you hear from Denise to hear the Luftronix video -- or to watch the Luftronix video; three minutes, I think.

SENATOR VAN DREW: Why don't we do that; yes.

MS. MATTESSICH: Great; thanks, Senator.

(video plays; the video can be viewed at
<https://www.youtube.com/watch?v=ahfADAKSOxo>)

SENATOR VAN DREW: Okay; very good.

MS. MATTESSICH: Thank you so much, Senator and Committee.

. SENATOR VAN DREW: You are welcome.

Good job.

Denise--

D E N I S E S P E L L : Yes.

SENATOR VAN DREW: --you're next.

MS. SPELL: Well, now you already know me, right? -- from my video. (laughter)

SENATOR VAN DREW: We saw you on the big screen.

MS. SPELL: Yes.

MR. FOSTER: It was a cold day.

MS. SPELL: Yes, it was freezing.

MR. FOSTER: You looked-- Those guys' noses were red. (laughter)

MS. SPELL: It was literally-- Do you remember the coldest day that we had this winter? It was, like, record cold? That was the day. And of course, I couldn't wear my jacket, because I was like, "Well, I gotta look fabulous, here, for this video." (laughter)

MR. FOSTER: Well, you looked fabulous.

MS. SPELL: Thank you very much. I was very, very cold.

MR. FOSTER: You were complaining; but I just looked up the six drone states, and *North Drone-kota* is what they call it. (laughter) I think they are a little colder there.

MS. SPELL: Yes.

MR. FOSTER: That's what they call it in this article here.

MS. SPELL: Thank you, first of all, Senator, for having me here. I really appreciate the opportunity to be here along with my colleagues and supporters of the academic institutions; and for your time. I appreciate that.

So I'm Denise Spell; I am the co-founder of Luftronix, the company that you saw in the video. I also have an innovation company around emergency management, called Current.

Luftronix is a company that does precision navigation -- precision navigation in environments where there is no GPS. So, for example, our drones could fly inside this room without an operator. It's a very difficult problem to solve, and we're doing that.

Our navigation system flies more precisely, in my opinion, than any other navigation system presently available for any drone in the world. We are solving a very deep, technical problem; and we have a lot of resources behind us from our parent company that we spun off from.

We have recently established a home here at Cape May County Airport, at the museum. You saw our aircraft there, which was -- the County helped us acquire that aircraft and come down -- to put our roots down here.

So I'm from New Jersey. I was born and raised here; I've been here my whole entire life. I'm very pro-Jersey. I would like to see the drone innovation happen here in New Jersey, in my own state.

And I'm really proud of the history of innovation that we have here in New Jersey; and I would like to see that history continue now. With drone innovation, I think we have an opportunity to be able to do that.

From the beginning, I've had the honor of being involved in this drone innovation -- this sort of groundswell that's happening down here -- from the beginning. So the New Jersey Innovation Institute -- thank you, Don -- had Purdue come in and do something called a-- What was it called now, Don?

MR. SEBASTIAN: *Strategic Doing.*

MS. SPELL: *Strategic Doing.* Strategic Doing looks at the resources that you have; what do you have available to you? Do you have an airport; do you have an FAA designation; do you have companies here; what are your resources? Everyone coming out of that meeting really recognized the fact that drones were the potential down in South Jersey. We all agreed; and I think the activities that have come out of that have been very impressive.

So since that workshop, Carole has outlined the different activities that have happened that have brought the innovators together here. So David and I have seen each other a lot over the past year or so. And these events bring together the innovators, the educators, the State officials, FAA representatives. And we network together, we find opportunities together. It really has been a way for us to connect and be able to grow together as a community.

That's really important to innovators. We need to be in an environment with other innovators, and we need to be in an environment that supports what we're doing.

So, let's see. I don't want to repeat a lot of the things that my colleagues here have said.

I will point out to you that we did a drone *Do Tank*, which is a -- we worked with an organization called the Field Innovation Team; Desiree Mantel-Anderson -- she's an amazing person who goes around the world, and she innovates in disasters. She and I, together with the County -- with the support of the County-- And also I want to mention that Atlantic Cape -- you actually supported us in that initiative; and NJII as well. So thank you very much.

It was a phenomenal event. We brought the United Nations down; and we did the very first ship-to-shore package delivery; which you guys saw earlier in the video. And what happened is, the United Nations folks came in; we were able, as innovators, to meet with the United Nations and talk through what's possible in disaster relief and humanitarian relief with drones. And these are the kind of activities that the County has supported with us all along, right?

So let me talk a little bit about why Cape May County is the perfect place to innovate; why we believe it's the perfect place to innovate.

First of all, right now, as you all know, the FAA has pretty much locked down everything, right? It's very hard to fly anything anywhere. So you have to have a place where you can actually get a bird in the sky -- like we were talking about before; a place where people understand the regulations, they understand how to fly safely, and all these kinds of things. So we have that down here.

So the airspace in Cape May County is very unique. I don't know how familiar you are with it; I think we have a map over here. (indicates) The airspace is very unique. So it has lots of different classes of airspace; some of it is commercial airspace, some of it is military airspace.

So for innovators, we're able to fly in these different classes of airspace. That's really important for us, for testing purposes; and I think some of my colleagues have mentioned this before. It's one of the reasons why we got our FAA test site designation.

Now, another reason is, you can't fly over people; it's a problem. We have a lot of people in New Jersey, in general. But down here, we have a lot of really open space. So as an innovator, I look at, "Where can I fly where I'm not going to go over buildings and I'm not going to go over people?" There's tons of that space down here; we can take advantage of that space. We love it, like Carole said. It may be an inhibitor to other companies to come down here; but for us, we love it.

And you can fly into -- up and down the seaboard, right? So we can fly into the ocean areas, we can fly up and down the seaboard. And those are the kinds of things that package delivery companies are looking for -- how to get the goods out, and up and down the coastline. It's really great.

Okay, so another key incentive, I think, for innovators to come down here in New Jersey is we have the backing of our universities. So we have universities here speaking today; we have had support from the universities, the communities. And it's not just the universities that want to do R & D -- which we love to work with -- but it's also the universities that are creating those curricula where the students are going to come out with the right skills. You guys are way ahead -- New Jersey is way ahead, in terms of that; and I think Atlantic Cape, really, is leading the way on that -- and thank you very much for that -- because we need those kids to come out and be able to get jobs at our company. They need to understand

aerospace, they need to understand engineering, they need to understand math. And they need to be able to come into our companies as interns, early in their careers, and be able to innovate with us. So for us, we look at the whole picture of -- why do we want to be down here? And that's a really key component for us.

Okay, so let me tell you a little bit about Luftronix.

So, our R & D facilities are actually in the Ukraine, in Lviv. Lviv chocolate, the best chocolate in the world. You should go there.
(laughter)

MR. FOSTER: That's an official Task Force statement now.

MS. SPELL: Yes.

DR. PERNICIARO: Field trip.

MR. FOSTER: For the record.

MS. MATTESSICH: Binding.

MS. SPELL: But our headquarters are actually here in the United States.

Now, I have two co-founders, Roman Pavlak and Klaus Sonnonleiter; you saw them both in the videos. We wanted to find a place to put down roots; a place where we could do tests, we could do demonstrations, and also we could import and export certain things.

So we were looking all over the globe. We were looking in the United Kingdom; France has a very big backing for their aerospace industry, so we looked at France; we also looked at Poland, among some of the places that we were looking at.

We decided not just on the United States for this facility, but Cape May County; and mostly because Cape May County has supported us in our endeavors.

The airplane that you guys saw -- for us, that's a huge competitive advantage, because other people who want to show major airlines the inspection process, they don't have an airplane to fly around; they have to simulate it. We actually have an aircraft; it's huge, right? Because airlines also don't have spare aircraft just lying around that you can go and run your testing on, because it costs them \$40,000 an hour when an aircraft is out of service.

So for us, the support of the County made this decision, for me and my co-founders, to say "yes." Cape May County is the perfect place to come innovate.

Okay; so here's where I'm going to inspire you guys to put the money where my mouth is. (laughter)

So there's always this moment in time, right? And I would like you to remember, 10 years from now, me talking to you about this moment in time. You can seize the moment in time, or you can let it pass you by.

So there's a moment in time in any sector where a new technology can give birth to an entire industry; like, I think Carole made a good analogy to early PC -- or David -- early PC, right? There was that moment; and where did -- a lot of the technology that grew up around that industry, it happened in the place where that innovation first started. We can be that place; New Jersey can be that place; South Jersey can be that place. We have the opportunity to do that.

Okay; on our side, the innovators here -- we're doing our part. We are dreaming big; we are working two and three jobs. We are creating the most amazing technologies that future generations are going to look back on these technologies and think, "How did we live without these things?" That's what we're doing. So we also need your support, and the government -- our government partners to support us in this. Like Carole said, we're really behind; and this is a problem. We are very behind the other test sites. We're also behind in other areas of the world, globally, where governments are putting a lot of money behind these industries because the industry potential here is really huge. Carole, in her testimony, shared how big the addressable market is here; it's enormous. We need to get a piece of that pie, but we need you guys to support us.

So here's my ask.

Already we have the environment set up. We have the ability to attract companies like mine; we already have the right airspace; we already have -- from the technical side, we have everything.

But what we really need to do is, we need tax incentives -- tax incentives, right? We also need investment. So I'm talking about investment in infrastructure, I'm talking about investment in-- I'm going to talk a little bit about the incubator program that we're starting down in Cape May County. The incubator program is going to happen inside the airport. There are eight companies -- the three of us here, and some other companies are coming down as the first cohort to go through this incubator program. We're having space that's-- It's office space plus flying space; and these facilities are on the airport. We want to generate -- through this incubator, we want to generate the pipeline of companies that are going to

come and innovate here in New Jersey. So we would like support for that, and other infrastructure projects that are going to come along that are going to need support from the government.

And also, other places around the country that have test sites -- the governments have actually bought services and put money into buying services and products from the drone companies -- so, eating your own dog food. So if we can--

MR. FOSTER: Dog? Eating your own dog food? (laughter)

MS. SPELL: You never heard that term? It's a very Google term, right? All the Google employees have to use Google Maps.

But the idea -- that we have to start generating some funds here to actually help us. Because we are-- It's very small; we were just born. This industry is just born; it's new. We need your support, as our government partners, to really get this going.

Thank you very much for your time, and for listening to me,

MR. FOSTER: I have a couple of questions.

MS. SPELL: And I know I'm number five, so I appreciate the fact that you listened to five other people -- or four other people. (laughter)

MR. FOSTER: You did very well; you kept it short. I got lost in some of it, but-- (laughter)

MS. SPELL: Okay, good. Okay, well, that's all right. We can talk later.

So thank you very much.

SENATOR VAN DREW: Thank you; thank you, Denise.

And Nate, you're last; so that's always tough. (laughter)

N A T H A N E R N S T: I guess the downside of going number six is that everybody else took my ideas, right? (laughter)

So, anyway, thank you, Mr. Senator, for having me today. What an awesome opportunity this is; one of my first ever political testimonies in a hearing. So bear with me.

My name is Nathan Ernst, and I am the Founder and CEO of a drone service providing company, Sky Scape Industries.

And actually, before I get into my letter that I wrote, Mr. Senator -- I'm not sure if you remember, but in April 2007, you actually handed me my Eagle Scout certification at the Lobster House in Cape May. (laughter)

DR. PERNICIARO: Oh, boy; all right.

SENATOR VAN DREW: Oh, my gosh.

MR. ERNST: So it's good to see you again.

SENATOR VAN DREW: It's good to see you again, too. It's good to see you're doing so well.

MR. ERNST: I appreciate that.

So I spent the first 18 years of my life growing up in Cape May County. I was born and raised -- I actually grew up in Cape May Courthouse. And then it came time for college, and I ended up leaving. I ended up going to Monmouth University; and I spent -- I did my undergraduate and graduate work there, where I was very involved in the Entrepreneurship Program.

Fast forward a couple of months after graduation, I decided that I wanted to figure out -- I decided that I wanted to start my own company. I followed some trends, and I figured out what I was really

passionate about. And now I'm here, today, as the President of a drone company.

So Sky Scape Industries is a little bit different than some of the other companies, like Denise's and David's. David focuses on long-range, high-endurance, traditionally fixed-wing aircraft, that he does some R & D and develops for certain sectors. Whereas our company uses a lot of the smaller, electric UAS systems that aren't long-endurance; but we do a little bit different methods of operation for collecting data in the infrastructure sector, primarily with electric utilities.

So we process that data, and then we manage that and deliver that back to the utilities, trying to save them money on some of their inspection costs.

So shortly after graduating college and starting the inception of Sky Scape, I needed to come up with some key considerations -- you know, where was I going to run my business; what was my business plan going to look like? And my first initial thought was, "Well, I want to go back to my roots; I want to go back to Cape May County." And for me, at the time -- this was back in 2014 -- one of my biggest issues was, "Well, when it's time to scale, who am I going to employ? Who am I going to employ from Cape May County who has the skill set, who lives there year-round, who has the education? And unfortunately, the answer was, not too many people.

And that's because, just like what I did -- I grew up in Cape May County, I went to college, and I never looked back, right? And I was business-minded; but if I was STEM-minded, or a STEM-educated student, I probably would have left for San Francisco, or Boston, or some of the other tech-minded cities that are not in Cape May County.

So I don't want to reiterate a lot of what my colleagues have said but, I mean, we all understand geographical location and the demographics of Cape May County; and how it's very, very inviting to the tourism industry, but very, very non-friendly to the year-round industries. You know, there are a couple of health organizations; but it's only dictated by the people who live there. There's a small commercial fishing industry; but the regulation and overregulation, arguably, from the government makes it hard for that to grow. And unfortunately, a lot of the residents who live there are either private contractors who are limited to only the people who live there and have homes for them to work on, or they work for health care organizations, or they collect unemployment.

So I get this question all the time -- and it was really valuable, to me, to meet Carole a couple of years ago -- but everybody always asks me, "You left Cape May County, you started a business, you have this entrepreneurial vision. What would it take for you to come back?"

And especially for my business, being involved in UAS, we need the infrastructure; we need to have some sort of an incentive to come back. And we've heard about tax advantages, and we heard about financial investment, and infrastructure. Just to give you an idea -- aside from the \$30 million investment from New York state if you start -- and I don't know all the specifics -- but if you start a startup business within a certain distance of a university in New York state, you're tax-free for 10 years. It's really an interesting model. And had I lived in New York, or close to New York, it might be something I would consider.

But right now, I actually operate out of Ocean County; and the only reason I do that is I'm very close, as far as getting to Cape May when I

need to be there; I'm very close to Philadelphia, via Route 70; and I'm very close to New York City.

So right now, we are in Ocean County; but the thing is, we're growing. And what's interesting is, being a part of the incubator program -- and meeting people like David, and Denise, and Carole, and Don, and Joe -- it's exciting, because we think that there's value in Cape May County. We want to be a part of it, and we hope that you guys are part of it as well.

SENATOR VAN DREW: So thank you all very much; very informative; very, very well done.

Let me say this. Of course, a couple of things come to mind. One, just so we know, the First District -- it's part of Atlantic County, and Cape May County, and just about all of Cumberland County too.

And then we have the President of Cumberland County College -- was here -- she is here; yes.

MR. FOSTER: They never mentioned her, so she left.
(laughter)

SENATOR VAN DREW: I know; so-- And she-- And so, that's just something to keep in mind as well.

At many of our Task Force meetings, we actually focused on Cumberland a great deal. And for those who are here, I just want them to know, on this particular one, we have focused more on Cape and Atlantic. But we've tried to be fair, and we've tried to really make sure everybody has, certainly, a piece of the action here.

Secondly, just before we go on -- and we're going to, truthfully, only take a few minutes of questions for this; because we also have to go through the draft report, which won't take long, and then we'll be done.

But we want to thank you for being here and, of course, we're interested in helping.

I'm a very candid person; you know that, Carole, you know that particularly.

MS. MATTESSICH: Absolutely.

SENATOR VAN DREW: So I say what I think, and I think what I say.

When you want help, you have to come to me; you have to come to us and say, "Gee, this is what we need, or what we want to try to do." There are two rules I have: one, you have to come to me, because I don't want to interfere -- unless we can help; and secondly, the second part of it is, the only promises that we ever make -- and I even tell this to constituents over the most minor of issues -- is that we will work our hardest and we will do our best.

And that we will. We can't guarantee everything.

There are a lot of things out there; and that's what we have to start connecting you all with, quite frankly -- whether they are Angel Investment tax credits; tech net operating loss transfers; Grow New Jersey; Entrepreneurial Support, which you are doing a little bit of, with the incubators already; and low-interest loans through EDA. I mean, there's a bunch of stuff, and we really have to--

And the Lieutenant Governor, previously -- now she's busy, because she's getting more-- Unfortunately, I hate when political season comes, because everybody gets so busy with that part of it. But she was involved with that a lot; and we also connected and worked with her on

some of those issues and particularly, actually, in Cumberland, we had done certain of these types of things.

When we go over the draft report, we already took that in mind. So in part of the draft report, we talk about incentivizing manufacturing and coming up with some sort of a plan, and asking the State to do that -- which kind of falls under you. And then secondly, also, Grow New Jersey; particularly, it has to be modified and changed to the best of our knowledge -- correct, Gene? -- in order to include all of you, to get that.

And you're familiar with the plan -- when you hire employees, you get incentives for doing that.

And some of these other things, maybe; I don't know. This is very complex stuff, and it's not easy, and you haven't been involved with it. So what we're going to do, Eugene, is we're going to get them involved with it, and make you part of that process. It's not going to happen in a day, but we will do our very best

There are always a lot of challenges; so the challenges are making folks understand I'm the only -- in the Senate, I'm the only South Jersey Senator who is on the Budget Committee, for example, okay? So making folks realize, from other parts of the state, what's going on here and what needs to be done, is quite a task. It doesn't mean we can't do it; we will. But it takes a little bit of work and a little bit of time too. And also, it requires a lot of cooperation between us to really work together to try to figure this out -- what best fits for you, what works, what's available.

Gene, I don't know if you have anything further to add to that?

Gene is a guru with this stuff; he really is. He's written a lot of the legislation, literally, that is now used by business people. He penned a great deal of that, with the Office of Legislative Services.

So I don't know if you have any thoughts.

MR. LEPORE: My insight, I guess, would go to exactly what Senator Van Drew hit on first -- which was, in order for the Legislature to do anything, we need to be in conversation; in conversation with the practitioners, with the experts. Because, you know, you can't expect, necessarily, your elected officials or their staffs to be experts in very esoteric fields.

So we need to know from you what we can do to help. And I'll make sure that you have my information, as well as information for Senator Van Drew's office, so you can contact us and we can start these discussions.

And when people talk about incentives -- that's something that, typically, we do through legislation. If we start talking about direct State investment, we're talking about the budget process -- which is almost upon us. The Governor will be delivering his budget address on Tuesday.

SENATOR VAN DREW: Tuesday.

MR. LEPORE: Yes. So after Tuesday, gradually information starts coming out; and the Legislature will review the Governor's budget and have an opportunity to make changes to that; and may see fit to make certain targeted investments. So this is the time for you and your industry to advocate to the Legislature for those targeted investments.

SENATOR VAN DREW: Thanks, Gene.

DR. KESSELMAN: Mr. Senator, may I just say one comment?

SENATOR VAN DREW: Sure; yes.

DR. KESSELMAN: No; (indiscernible). Go ahead.

SENATOR VAN DREW: I just wanted to finish my thought--

DR. KESSELMAN: Finish your thought.

SENATOR VAN DREW: --and then roll right into it.

And of course, you are going to clarify that with your Freeholder Board, so that they understand that you are going to be working closely with us--

MS. SPELL: Absolutely.

SENATOR VAN DREW: --and that they're comfortable with that.

MS. MATTESSICH: Got it.

SENATOR VAN DREW: Okay?

MS. MATTESSICH: Yes.

SENATOR VAN DREW: Okay.

Okay -- President.

DR. KESSELMAN: Just one thing I'd like to say.

I haven't heard our name mentioned much, but I want to put on the table that I'm not sure there are many other institutions in New Jersey that have put more into establishing, for example, the Stockton Aviation Research and Technology Park; and have funded full-time positions -- one of whom is the gentleman over there (indicates); and put into the game to make this real -- okay -- millions.

And I think it's really important that we don't try to duplicate one another; but we work closely together. We're building a research park; and as a result of our work at the Atlantic County Improvement Authority,

it's happening; it's not a dream anymore, it's happening as we speak, by the airport, at Atlantic International.

It's not part of Cape May County, but it's certainly large enough for the south-- We don't see that as an Atlantic County initiative; we see that as a regional initiative. It's taken a long time to get where we are, but this will become a reality. And then all of what we can put behind it to make it successful, we're going to do. We have consistently done that, in a number of projects.

So I think we need to come up with ways to-- When I'm hearing, "Hey, we're going to have a research park." I can't imagine that there wouldn't be some kind of opportunity for you folks to be part of that research park. That's the whole essence of why we're doing it.

And clearly, there will be enough for not just Atlantic County, but Cape May County. We feel-- Just to put this in perspective: We have a lot of your students -- a lot of the students who don't-- Some leave (indiscernible), a whole lot come to Stockton, okay? We know exactly where we get students from and how many we get in your area, you know -- comes here. We have a strong program; we're not an engineering school, but we are a strong academic program, certainly, to support this initiative.

So I think it's very important-- And we are closely associated with Atlantic Cape also. So I think it's very important-- And NJIT -- I know Joel quite well; I know, in fact, our newest Trustee used to work in your Innovation Center; I know he developed it. And so we do have a connection. Our energy is going in that direction, and we just want you to know that we're more than a friend; we're a neighbor. We want to be partners with you as part of this.

SENATOR VAN DREW: And President, we thank you for that. And again, let me do my crazy candid thing again. We don't want the whole thing to end up there, and have nothing in Cape May County.

DR. KESSELMAN: No, I get that.

SENATOR VAN DREW: We want to increase some housing in Cape May County; we want millennials moving into Cape May County -- and Cumberland, for that matter -- which is just a whole different issue -- and, of course, Atlantic.

You have a lot going on there in Atlantic, which is really good and really exciting. But I don't want this to be the land that time forgot, quite frankly.

DR. KESSELMAN: No, absolutely.

SENATOR VAN DREW: And there are unique problems and unique issues. It's one of the most beautiful areas, literally, in the world; but we do have a problem. And I know populations are dropping throughout the state, in various areas. They are significantly dropping in Cape May County, and we cannot allow that to continue.

So as we have that process, that has to be a partnership -- where there's a whole lot going on down there in coordination with what you all are doing over there. But we can't forget about them, and lose them. We need to keep them there.

Assemblyman Andrzejczak, I know you had a couple of questions.

ASSEMBLYMAN ANDRZEJCZAK: I want to thank everybody for coming and sharing your time with us today. It has been very informative and educational for me.

I grew up right by the Cape May County Airport; and having something like this taking off and, literally, taking flight, right there, really means a lot to me to see that area be able to grow and become prosperous.

I just had a few questions.

How big can the industry grow in South Jersey before the airspace becomes too crowded? I know we have pristine conditions now, but at what point would it be too much?

MS. MATTESSICH: I'll defer to David.

I will tell you that we are just, within the County, beginning to work with a task force that addresses that and other protocol issues. It's really a great meaty question, because you don't want to lose what makes you so special; and it could happen very, very quickly.

David is the pro on all these technical aspects.

MR. YOEL: Well, I would just say that current law, or regulation, allows for one unmanned aircraft system to be operating at any given time within the airspace. In two-and-a-half years or so, we've flown 5 weeks. So take 250 weeks, and we've flown 5 weeks; that gives you a general sense of-- And we didn't fly every day because of weather and for other issues as well; some of the campaigns were just three days.

But that's, you know, 5/250ths of the utilization of the airspace. And one can look at segregating the airspace to operate from multiple airfields, and those kinds of things. So there's enormous capacity unfilled, unutilized, today. What the ultimate capacity is, as the regulations evolve, that will continue to grow. Because even at Cape May Airport, I think, in the summer, you're looking at, maybe, 50 flights, 75 flights a day -- manned aviation. And we certainly have had no issues or

concerns expressed from the manned aviation community, by the way, in our operations at the airport. But hopefully, that will give some perspective on that.

ASSEMBLYMAN ANDRZEJCZAK: Thank you.

One other question, and it would be for the smaller drones.

I know the agriculture industry uses drones, currently, as far as checking for different things with the crops, and temperatures, and moisture, and all that. What would have-- Currently, can the fishing industry use the same thing, as far as spotting? And if not, what would have to change for that to happen?

MR. ERNST: So our company isn't involved in the fishing industry. I do-- Dave, can I defer to you? Did you hear something -- they were doing something with the commercial tuna industry. I don't know if it was off of Cape May. So my company is primarily involved in electric utilities. As far as other regulations, I don't think that there would be; would there be?

MR. YOEL: So the very first long-endurance drone company -- or unmanned aircraft systems company in the United States was founded in Oregon, named InSitu. And its original business, back in the early 1990s, was fish spotting in the South Alaska seas. They grew to the point that Boeing bought them for \$340 million. They're now a multi-billion enterprise, mainly focused on the Defense Department.

But there's a huge value in fish spotting; I can't tell you, if ever quantified, what the magnitude of the local fishing industry is, but fish spotting has -- UAS has deep roots in that application.

MS. MATTESSICH: If I may, Chair, too, real briefly -- that one of our innovators, a fellow named Tim Doelger, has a company called Cast Further. And what his drones do is--

ASSEMBLYMAN ANDRZEJCZAK: They fish for you.

MS. MATTESSICH: Exactly. (laughter)

MS. SPELL: Yes.

MS. MATTESSICH: They cast further, so watch out when you're involved in tournaments. (laughter)

ASSEMBLYMAN ANDRZEJCZAK: Thank you.

SENATOR VAN DREW: Assemblyman Land.

ASSEMBLYMAN LAND: Yes, I also want to thank you all for coming in today.

I'm a little older than my colleagues here; and I grew up in the day of transistor radios and 10 cents in my pocket to make a phone call. (laughter)

But the technology is fascinating. My background is in military law enforcement; we already know the aspects and the benefits of the drones and unmanned craft for those industries. And it is just amazing the possibilities with, like, agriculture, aquaculture, fishing, engineering.

And if we can get this industry down here, get people down here -- whether it's the building, the training; I mean, Cape May County, Cumberland County, Atlantic County -- we need the jobs down here. And I just want to thank you so much for coming in, and I'd just like to see this fly.

SENATOR VAN DREW: Literally. (laughter)

ASSEMBLYMAN LAND: Literally.

SENATOR VAN DREW: Okay.

MR. SEBASTIAN: To put a bow on the Senator's original comments -- one of the other important applications is utility inspection; not only power lines, but pipelines.

MS. MATTESSICH: Yes; good point.

SENATOR VAN DREW: Mr. Roy Foster.

MR. FOSTER: I just have a couple of quick things, with my Chairman of the Atlantic County Improvement Authority hat on.

When you get a chance to speak in front of a Task Force, and you're all excited-- And my job, on this, is to find out -- to hear what you guys say; and then keep an eye on those guys, and make sure that if they need any help in getting votes -- whatever we can do to try to make stuff happen -- that's what we're here for.

I mean, everybody told us what you're doing and what's not available. You say we're behind. What state did it right? And do you know what state did it right and, if they did, what they did right so you can show his staff what they do instead of just saying, "We're behind the eight ball." How do we catch up?

MS. MATTESSICH: We can provide you with our files, if you'd like, on the -- you know, articles and so forth about what other states have done to--

MR. FOSTER: But what do you-- I mean, off the top of your head, what do you think? Who is doing it right?

MR. SEBASTIAN: Look, I can tell you the other two states--

MS. MATTESSICH: New York state--

MR. SEBASTIAN: --in the Mid-Atlantic Aviation Partnership; the FAA (indiscernible) that we shared. Each were putting in several million dollars a year into building their test sites.

MR. FOSTER: Okay.

MR. SEBASTIAN: We put in about \$100,000 a year; and mostly to pay our dues at Virginia Tech to be part of the club. (laughter) We stopped that.

That allowed them to create substantial infrastructure, both administrative infrastructure and physical infrastructure. They've taken different routes. So Virginia Tech has mostly focused on small drone flights to service the academic interests of Virginia Tech. So that leaves the door wide open for many of the things that we're doing. And Maryland -- they were, I think, primarily aligned with the Naval Air Station, and so it has a military flavor.

So it really leaves the door open for us to create -- not to come in as the third wheel or "we too"; but to stick to our vision, which is do all the things I described, in the civilian airspace; and as Dave and others have asserted, particularly the emphasis on the larger aircraft and the important things that we can do with those.

MR. FOSTER: And in your world -- in a perfect world, if everything was here, and people were coming into the industry, what -- so I can understand, I guess -- what jobs would you be creating? Are we looking for more -- are there going to be researching in (indiscernible), or actual implementation of using them in the real world, so to speak?

Like, right now--

MS. MATTESSICH: It totally runs the gamut right now. We have companies that are software developers, because you need the software to put in the payloads that the drones carry. We have companies that -- like David's, has the plane that can actually fly the missions.

We actually have a small manufacturer that we've brought in; a Great Britain company that's going to relocate at the Cape May County Airport. And even though they don't manufacturer drones right now, we knew that, right now, all of the millions of drones that are bought each year in the United States -- over 90 percent of them are manufactured in China, because the United States was so late coming to the table on being able to fly drones.

So there's this huge space, especially for light manufacturing companies. The people who manufacture drones really just manufacture the casement. So we've brought someone in who expressed an interest in light manufacturing; even though they make something in a different segment, they've started talking with our drone innovators -- they're going to be part of this incubator situation -- about possibly doing light manufacturing of drone casements. So that's just another example of the kind of work they can do.

MR. FOSTER: I think that's what excites me. If you're trying to get 21 Senators to vote, and then 41 Assemblymen to vote; and they're going to pass bills to give money -- they should be able to visualize what it's going to create.

MS. MATTESSICH: Okay, okay.

MR. FOSTER: What's going to happen.

MS. MATTESSICH: Get that kind of detail.

MR. FOSTER: If we do *this*, we think *this* can happen; not a bunch of statistics, but, you know, we see the manufacturing of drones -- something like that, that I can get my head around. So that's all -- if that makes sense.

SENATOR VAN DREW: That's a good point. It's a good point, and we'll certainly welcome your input when you're working with Gene and our folks in the Legislature.

And this is a New Jersey problem too; it just really is. Again, just putting my candid hat on again; whether it's aquaculture -- it's unbelievable. It's a whole separate issue, and I don't want to take up very long with it, but other states started when we started; and those states have exploded and have done so well. Some of them have grown 30 times as much as we have in aquaculture, and it's because we were so bureaucratically bound. And we actually-- The good news is, now we've actually got the State to do it -- we passed all the legislation; I think it was four pieces, Gene?

MR. LEPORE: Yes.

SENATOR VAN DREW: Four pieces of legislation to actually change the way aquaculture is done in the State of New Jersey. It was actually this legislative team that did it -- to really have something that can move and can happen quickly.

We're way too bureaucratic; we're way too slow. Whether it's the nation in many ways, dealing with other countries-- I mean, we really have to get moving, and get smarter, and faster, and less bureaucratic. And certainly, New Jersey is almost the ultimate example of that, because there are many areas where we could do better, and this is just one of them.

Unless there are some other questions here, I'm going to thank you all for being here.

We are just going to run through-- Because this is actually the last meeting; we got you in under the wire.

Quickly, what we are doing -- and some of it does apply to you, so you might want to -- this shouldn't take long at all -- listen to what we're doing here.

And you saw the report; everybody has the report of the Task Force. We will e-mail it to everybody else.

And the first half of it -- I'm not going to go through what we said and what we did at every meeting, who was at every meeting. We had college presidents -- and, like, we're lucky enough to have now -- and a lot of folks, and came up with some ideas.

So if we get to page 6, I'm just going to, very briefly, go over the direction that now the Legislators are going to take.

So the first-- If you look at page 6, it says, "Regional Marketing Plan," which is one of the things we're talking about. And one of the areas is the Task Force is going to recommend that detailed legislation -- that's our Task Force -- be introduced and enacted to develop and implement a manufacturing business attraction, expansion, and retention marketing plan for areas located in southern New Jersey. So again, that may be something that actually helps. That's legislation we're in the middle of now; we're actually working on this legislation as we speak.

County colleges: The Task Force recommends that detailed legislation be introduced and enacted to encourage the development of certificate programs at county colleges. And the reason we're thinking that

is because, in some fields, it isn't necessarily just the degree; a certificate program gives you the technical ability to-- For example, service things and take care of them in that way, too; and we want to -- and we heard that from many people during that second meeting, and that's one of the areas that we want to look at.

So again, we recommend that detailed legislation -- and we're going to do all this -- be introduced and enacted to encourage the development of reentry programs, cited above, for juvenile offenders at county colleges, so that county colleges -- which, sometimes, lose some numbers -- could actually work with some of the juvenile offenders -- minor juvenile offenders, and help them to really have a future. Some work is done in the prisons; but sometimes they come out and they don't know any more than they did before they went in. And what do you think they're going to do? They're going to end up going back in.

So we want to, kind of, maybe, come up with legislation that incentivizes county colleges to help those folks to get trained again for certain types of work, which would be a good thing.

Aquaculture industry: If you read through it, we did one, two, three, four pieces of legislation, which changes the way that it was. They actually-- There was a problem in aquaculture, where they had to work with the DEP-- You're an entrepreneur; you want to do aquaculture. You had to work with the DEP, you had to work with the Army Corps of Engineers, and you had to work with the Department of Ag. And three of them could not agree with each other. Worse than that, the three of them, internally, couldn't agree with each other; which is a horrific problem.

So without exaggeration, Bruce, Bob, and I have met with people -- young entrepreneurs; and some who weren't so young, as a matter of fact -- but who really wanted to do aquaculture in New Jersey; had seen what had happened in other states. And some of them were literally crying; they were literally crying. They had spent money; they had really tried; they had worked so hard on this, and they could just never get a definitive answer to what they're doing. And in fact, I think it was the DEP that hired somebody to try to straighten it out, and wasn't able to really do it.

So we did do it with the legislation. Now, we did the legislation; they have to enact the regulation. So we have to try to push them to do that. And that's basically where we are with that.

We also -- again, which doesn't apply to you -- but we wanted to form a task force among higher education to determine the feasibility of creating a New Jersey Marine Science Institute. Rich, you and I -- we all talked about that; a Marine Science Institute would be something that, again, would uniquely fit our area -- just the way your business does -- and something that we should do, and we should really look at.

So again, that's one of the areas that we want to do some more work.

And finally, the Haskin Shellfish Research Laboratory at Rutgers; it's been there over a century. It does great work; it hardly has any money. We're going to try to get it some money. I don't know, in this economy, and I don't know with this budget; but we're going to try to do our best with this.

Again, not dealing with you, but something we heard with a lot of people -- maybe it does deal with you a little bit -- a lot of folks talked

about the complete lack of transportation that we have. It's partly due to our low population and our remote location; but that we are really looking to enact -- to have New Jersey Transit conduct a study to find recommendations to the Governor and Legislature. Some kind of transit. We've even talked about the jitneys, if you can imagine, in Atlantic City, and what they do. Is there some way we can get people back and forth to work better; some way that would fit in with all that's happening?

And then, we finally talked about the aviation technology; we did put that in there. And we're recommending that the legislation be introduced and enacted; and we're actually working on what you want already -- we're in the middle of that as well -- to offer -- for the State to offer tax credits to businesses at the airport.

And that may end up being Millville as well, for something different; it may be both. I don't know. But we're going to work on that.

And that's our recommendations; that was the work that all of you did, believe or not, over all that time and all those meetings that we had.

So we're open to any questions now; this is pretty much the end of the meeting.

Yes.

MR. YOEL: Senator, it may be a little premature, because I haven't actually done any research on this.

But the State of New Jersey spends a great deal of money on aviation operations over the year. I don't know what the budgets are; I know, certainly, there's the State Police, and there are other entities within the State government -- and I'm sure the County governments to some

extent, as well -- that invests -- that utilizes aviation services. And since this is -- you're just going into this, and this is your final meeting and all, perhaps I'll put it out; perhaps a look at the regulations could be made to remove any stumbling blocks to those agencies utilizing unmanned aircraft and drones in their aviation operations.

So if those bottlenecks exist or those barriers exist, perhaps they can be addressed. It's not a money aspect; it's a regulatory change that may be something worth considering.

SENATOR VAN DREW: Which would be good; and it's good, because it isn't a money ask.

But we're going to work on it all; I don't know how long it's going to take. And I'm going to tell you -- I'm going to say this for the three of us -- the one promise we'll make is, we'll work our hardest and we'll do our best. And we really will try.

We're dealing with New Jersey, and we're dealing with some tough folks up in the northern part of the state. And so we're going to really have to battle it out and work on it. But we will; and we'll give it our best.

Are we good?

MR. FOSTER: We're good; peace. (laughter)

SENATOR VAN DREW: Okay; this meeting is adjourned.

MR. FOSTER: Thank you.

(MEETING CONCLUDED)