

Center for Strategic and International Studies

TRANSCRIPT

Event

“Using Drones to Expand Healthcare Delivery”

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FEATURING

Caitlin Burton

CEO, Zipline’s International Business

CSIS EXPERTS

J. Stephen Morrison

Senior Vice President and Director, Global Health Policy Center, CSIS

Transcript By

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J. Stephen
Morrison:

Welcome I'm J. Stephen Morrison, senior vice president here at the Center for Strategic and International Studies in Washington, D.C., where I direct our work on global health security. I want to offer a special welcome to everyone who's here in person and those who are joining us remotely. Today we're hosting Caitlin Burton, the CEO of Zipline's International Business. And the subject on the table here is "Using Drones to Expand Healthcare Delivery." It's the special focus here is the program in five African countries, which I'll describe in a moment.

Few words about Caitlin. She studied here in Washington D.C. at George Washington University. Went on to do a master's of policy affairs at Cornell. Before joining Zipline, worked on a variety of different innovative digital financial products. Worked on pay-as-you-go solar products across Africa, and has taken on these responsibilities of leading the efforts of Zipline to expand its program. Been involved in Africa for a decade now.

Ten years ago, we convened here at CSIS just as Zipline was getting underway in delivering health in Rwanda. We convened a whole enormous number of people who were experimenting in a variety of ways around drone and health delivery. And the big impression from that day's gathering, which we did together with Peter Small, who was then at Stony Brook University, was that this was a field that was somewhat chaotic. It was a little difficult to know where it was going. It was hard to realize what was sustainable, what was cost-effective, what was the data to back things up, where was this going to go, how were we going to regulate and scale this, how are we going to finance this? Well, we're in a very different place here today, as we will hear, 10 years later.

And in some respects, Zipline's leadership role in this is a reflection of the fact that it made a commitment 10 years ago and stuck with that commitment, and built a variety of partnerships and relationships, which we'll hear about here today, which became the foundation for what we're seeing now. We're here to talk about an agreement, a three-year cooperative agreement grant that the Department of State awarded to Zipline in November of last year, so nine months ago – \$150 million, three-year agreement for Zipline to build the infrastructure for zone delivery – for drone delivery systems in five African countries.

It's a pay-for-performance model. And we'll hear about what that means. It is a companion to another innovative technological award, that is the lenacapavir partnership that was announced September 18th, just a couple months before the Zipline partnership was announced. And the lenacapavir one was to expand the delivery of the prophylaxis PrEP, anti-HIV drug, that involves Gilead Sciences, the Department of State, and the Global Fund. And we hosted them here in April, the leadership here, much as we're hosting you today. So this is a follow-on to something that was quite successful then. And

we hosted the organizers of the lenacapavir at the Rio de Janeiro International AIDS Conference.

Last thing I'd say, before we turn to Caitlin, is that what is happening in Africa – what Zipline is doing in Africa fits in a larger picture of very ambitious and expansionary plans by Zipline, particularly here in the United States. The valuation of this firm has grown by leaps and bounds in the last couple of years to an estimated 7.6 billion (dollars). Earlier this year when there was a(n) equity campaign, of 600 million (dollars) in that period. We're seeing programs rolled out – very ambitious programs rolled out across Texas. We're seeing programs in Arkansas tied to Walmart. We're seeing hospitals beginning to be served in Cleveland and soon in other places, such as Seattle. So it's a big moment. It's a big moment in history in this particular endeavor, and the role that Zipline is playing in this endeavor. So, Caitlin, thank you so much for being with us.

Caitlin Burton: Thank you for having me.

Dr. Morrison: We're very honored – very honored and delighted to have you with us today. We're going to talk for 30 or 40 minutes, and we're going to open the floor for folks who are here in person to offer some quick comments and questions, and then we'll conclude with that, and we'll give you a chance to wrap up. So why don't you just start? Give us a quick snap update on Zipline's work under this partnership.

Ms. Burton: Sure. All right. So I assume, you know, everyone's got the context on Zipline and what we're doing. Just to make sure everyone's clear, we've been procured by African governments to operate in Africa in the public health supply systems for the last 10 years. This award was a bit of an extension on that. You know, maybe going back a tick, when USAID shut down the countries that we already work in, they kind of just consolidated their supply systems. They gave us HIV, TB, malaria drugs that we hadn't had before, and they kept the trains running. And I think there might have been a little moment of panic, like, what are we going to do? And then there was this, oh, well, we have a system, and it was already delivering blood, vaccines, and essential medicines. We'll use the same system.

That was, like, eye-opening for us. We were, like, oh, there's an opportunity here for you to just run with this. And many billions of dollars less can be spent and your system will just be one cohesive, coordinated system that you're directing. And so the governments, you know, they kind of put their hands up and said, if we can have more of this infrastructure to take what we have nationwide faster, we'll pay to use that infrastructure to continue doing this job for us. And that's what the State Department set out to do. So, as you said, it's a milestone-based award. The first milestone is when a government signs an expansion contract with Zipline for more hubs, more coverage, the

State Department pays for the infrastructure for that, the capex. And then when that hub goes live, there's a bit of an OPEX subsidy that the government can use to ramp up its payment for the system, so it doesn't just go from kind of zero to a hundred overnight.

We have – you know, kind of right out the gate we announced that Rwanda signed an expansion agreement. It'll be the first fully nationwide drone delivery system, because, you know, it's going to cover the entire country, including the cities. So there's never been an urban drone delivery system in Africa before. So that'll be a first. We've already built it. It's ready to launch. So nine months after signing that agreement, we're ready to go live in Rwanda. We have a couple other announcements we'll be making next week in UNGA, at the U.N. General Assembly. We're letting our government partners lead the way on those announcements because it's really their – it's really their news. But, yeah, making good use of this award. It's a \$150 million ceiling. It will only tap all of that if we have – yeah, if we have governments that are asking for it.

Dr. Morrison: So you're building the infrastructure, with the aid of the 150 million (dollars). But it's contingent on the government, the partner governments, buying your services and committing over some period of time. And the expectation is that in the period in which that 150 million (dollars) is deployed, you should be able to secure some upwards of around \$400 million of fees for services. Does that capture it?

Ms. Burton: Fairly accurate, yeah. I mean, I think that was estimated over a decade.

Dr. Morrison: Ok.

Ms. Burton: Yeah. And so some agreements might be longer, some might be shorter.

Dr. Morrison: OK. So five countries, one jumped out of the gate very fast. Tell us a bit more. What's been built so far?

Ms. Burton: It's really cool. We built a third hub in Rwanda. We built it in Karongi, right on the border of Lake Kivu. It's sort of a hotspot. I think a year ago we would have said it's a security hotspot. And I think putting a piece of really significant critical infrastructure right there is a – I mean, it was part of the Regional Economic Integration Framework following the peace deal. It's meant to be kind of a symbol of lasting peace there. And so Zipline, we built that over the last few months. I think it was about four months from breaking ground to having a fully live operational nest, as we call it. Yeah, we hired a team. We trained them up. We have – you know, it's a fully equipped medical warehouse. And then we'll begin building our urban drone delivery system next. So that's the next project underway in Rwanda.

Dr. Morrison: And what does that mean exactly?

Ms. Burton: It's interesting –

Dr. Morrison: For our audience here who's less familiar with this, what does that mean?

Ms. Burton: Yeah, OK. So, you know, all of Rwanda, with the addition of this Karongi hub, now – has everything outside of Kigali now has pretty much instant access to blood, vaccines, and medicines on demand. So everyone's got access to a world-class pharmacy instantly. That causes, you know, clinic utilization to rise. It causes treatment rates to improve. And it causes really profound impacts on population health.

When we add Kigali to that we will have a different drone operating, a precision delivery drone that operates in urban centers. Forty percent of Rwanda's medicines are consumed in the city. And so right now they have a patchwork system of, you know, who's helping them do those deliveries. We'll integrate right into that and help them have kind of one seamless model that covers the whole country.

Dr. Morrison: And why are they so – why is Rwanda so committed and so keen?

Ms. Burton: I mean, they've used it for 10 years now. And they have realized extraordinary benefits. I think a good example – so when Rwanda – when we started partnering with them, they asked us to tackle the blood use case. They said that if you can – if this technology can save women's lives in childbirth, we'll use it. You know, we'll try anything. The autonomous beyond the visual line of sight drones were not permitted really anywhere in the world at the time. And so Rwanda was the first country in the world to put its hand up and say, we'll try this, if it's going to solve this problem for us.

And that's kind of, like, the hardest problem to solve because you need to – you're handling a fragile product. It's urgent. You have to have, like, 100 percent uptime and reliability. It needs to be able to fly day and night in all weather. You can't just have a system that works when it's sunny and call that a solution, especially when the outcome is so critical. So Rwanda, you know, they gave us some breathing room to test this. And we were able to build a really, really robust version of the product that can operate in their, like, extreme lightning storms, you know, high winds, and rainfall. They are right on the equator so there's also, like, solar radiation, solar weather to pay attention to, all sorts of really interesting things that have to do with really hardening this technology around real-world problems, that made it so solid that it can handle the most critical use case you can imagine.

What Rwanda did when they got that proof point, you know, I think a lot of people – we were talking earlier about that previous conversation you had,

and whether or not – one of the questions people were asking 10 years ago is, was this cost effective? And I like to think about, like, the Ford Model-T. Was that an expensive pilot or was that just the first car we ever built, right? So 10 years ago, Rwanda – maybe people looked at that and they're like, cool, that was an expensive pilot. Rwanda looked at it and they were, like, that solved the problem we asked them to solve. You know, we're going to scale this.

And so they took these blood collection centers around the country that used to collect blood, process it on site, and then distribute it in their footprint. And you had a lot of doctors on WhatsApp groups being like, can you – do you have this unique blood product I need? They turned them into collection-only centers. They sent everything to Kigali for processing and productization of blood. And then they gave it all to Zipline to deliver. They just completely changed the system and they bet fully on it. And now here we are, 10 years later, operating that system. And they've nearly eliminated maternal mortality from postpartum hemorrhage.

Dr. Morrison:

Now, if we step back for a moment, when the Trump administration first came into its second term, we had, you know, the big rupture. We had the DOGE dissolution of AID. We had disruptions of all sorts of health and health security programs. And it raised this question of, OK, the dependence of African governments upon donor flows has now been exposed. And a lot of other governments, less dramatically, also were scaling down. And so the foundation, the external flows, the foundation of dollars going into Africa and other low-income countries dropped by 30 to 40 percent.

And some of that was multilateral. Much of it was big donors, like the United States, U.K., Canada, others. And the governments themselves, you know, it sort of thrust this decision process back onto the governments. And there was all this talk about health sovereignty, that Africans now have to really kind of figure out and dictate and define what are their priorities and what are they looking for in this. And so it started the Accra reset. It started this whole process of deliberation. We're still waiting to see sort of where does this go. At the U.N. General Assembly, I'm expecting that we will see perhaps some more to that.

But a lot of these governments were saying, we'd love to do more and to take up more responsibility but we don't have any fiscal leeway to do this. We've got a huge debt overhang. We have many other priorities pressing in on us. All of that is by way of saying, here you come forward with something on offer, which is a technology. It's not inexpensive. And you're coming forward, and in the case of Rwanda you've been there 10 years, and some of the other African countries you've been there for a while. But this is – these are distressed governments in some fashion, having to make some really hard choices, that have seen a significant drop in their flows to support the most

basic health stuff. So what persuades them to come your direction and see this as a priority investment?

Ms. Burton:

That's a great question. I think that this is one of the three pillars of a functional health system. You need the drugs to be invented and procured. You need the health workers to be trained and hired and paid. And you need the drugs to be there when the patient comes to a clinic, right? And if you only have two of those things – what we saw all that time was that couldn't solve the problem. You can keep retraining health workers, you can keep procuring the drugs for the country. But if a patient shows up and their kid can't get immunized or they can't get treatment for what they – you know, what they came for, they stop coming to the public health system. They come when they are really sick and their case is way more severe and expensive to treat. They go to the private sector and they pay out of pocket, which sets them back a lot.

You know, like, that piece was actually missing. And so I think people were pouring billions of dollars into these health systems. And it was, like, this leaky bucket. It was just flowing right back out. because you can do all that training you want, you can do all that procurement you want, but if the drugs are not there you can't solve the problem. I think the governments know that. They're right there on the ground. They can see that that problem is there. I don't think that the global health system necessarily knew that. And so they weren't looking to solve that, to the extent that governments were.

I think that when you can solve that problem, governments actually save a lot of money. You know what I mean? The population health improves. You need population health to improve, because you need a productive workforce. And then you need to be able to invent things, and export things, and grow your economy. That's how development happens. And so I think this is a big foundational investment in their future.

Dr. Morrison:

Now, like anything, like any decision process, you're going to want sustainability. You're going to want to be able to build this and have this last for some significant period of time. So once you get past the sort of initial question of can we really afford this, do we have the wherewithal, and is this a priority for us? And they see, OK, the U.S. is at least willing for this three-year period to underwrite the infrastructure as long as they come forward and front end a commitment to them. But sustainability is not guaranteed in many of these places, right? And you have political transitions that happen. I mean, you went through a very bumpy political transition in Ghana. You're still trying to figure out how to manage that. We have our own political transitions that are very, very bumpy here.

How do you deal with that vulnerability, do you think, as you're trying to build this? One of the things you told us earlier in our conversation was that

your approach, your model here, it's commercial diplomacy, but it's at cost. The entire enterprise is the firm is committed to at cost. So tell us about that, and how that figures into your making your case for sustainability. Because at the end of the day you're only there when governments say we want you there and we're going to pay you to be here.

Ms. Burton:

That's true. I think getting the infrastructure in place is the hardest part. You know, that somebody needs – we discovered this over time. Zipline was financing the infrastructure itself and a government would pay us back over the course of, you know, a 10-year agreement. It made their monthly payments much higher than it needed to be. We were just in the red, and we were in the red for 10 years. You know, it's really hard to build a company that way. And if you want to scale nationwide, and you want to see 30 or 40 or 50 of these hubs, we don't have the capital for that. So there needed to be another way. And I think a lot of people thought debt, but someone still needs to repay the debt. And that's going to be the government, because the government is the buyer of the service.

If we really want to solve extremely tricky problems in public health that have never been solved before, you know, we need this to scale and there needs to be a new kind of capital made available for that. So that's what the U.S. government stepped up and did in the commercial diplomacy. I think that the governments themselves, you know, they're putting this in their national budgets, as they always have. You know, they're kind of consolidating plans around it. So other funding and other support they have from multilaterals that involve supply chain and distribution of goods, you know, can be applied toward this if they need. That's kind of between them and their partners.

But what Zipline is doing is getting that infrastructure out. And our primary purpose is to serve the public health system to solve these problems at the lowest possible cost. As we put down new hubs and scale our manufacturing, it gets less expensive to make these systems. And we can pass that savings onto governments and make it cheaper over time. But we can also – like a road, that same infrastructure can serve anybody else. So it can work horizontally across industries and serve the whole economy. And it can reduce that logistics tax on African commerce that's making trade so hard, and exports so hard, and consumption of goods and services so uneven. And so I think this is – like, governments know this. Maybe the global health system is just catching on. This is a foundational investment in your infrastructure, so that logistics work. And that way human development can flourish, you know, commerce can expand. These are all important things for development.

Dr. Morrison:

Why has Zipline made this commitment to do this at cost?

Ms. Burton: Because we –

Dr. Morrison: You're a for-profit firm.

Ms. Burton: We're a for-profit firm. We are. But, you know, this is a new technology. Governments have for 10 years been sticking their neck out, putting – you know, putting their hands in their own pockets and paying for it. I don't think we really saw that happening anywhere else in the health space. There was a lot of money available. And by and large, they were getting what they were given. And this is something that they wanted to pay for themselves. And Zipline wanted to make it as affordable to everybody as possible. There's a barrier to entry. And the lower – the lower we can make that, the more this can be adopted, we just have a lot of conviction in what that provides. That it solves problems that we haven't been able to solve. The ROI on this is we end maternal mortality from preventable causes, we end under-five mortality from preventable illnesses. That's what we're trying to do.

Dr. Morrison: Yeah. So under this current arrangement with the Department of State, the bet is 150 million (dollars) put into the infrastructure that you talked about, foundational infrastructure, in five countries – if you can do it and win the commitments from the governments it'll succeed, it'll take off, it'll be in place. If you prove the concept in three, four, five of these countries. At the end of that three-year period, if we're sitting here in two years, and it looks like that. And the question is, can this be replicated and can it be scaled in Africa? And what I hear you saying is, you're going to need more financing for this from somewhere, for the infrastructure in those other 45 countries, if you're going to go there. May not be the United States wants to go, you know, from 150 (million dollars) to a billion (dollars). Maybe the next – you know, maybe the next administration does want to do that. But it also suggests that some kind of innovative financing is going to be needed to scale this. Is that what you're feeling?

Ms. Burton: Yes, I would agree with that. Yeah, I do think that the more – if we want this technology to solve the problems it is solving at a larger scale, you know, someone's got to pay for the infrastructure for those countries to get it faster. Apart from Zipline paying for it itself, some governments did adopt the system and amortize it into the cost of their contract. And they just adopted it really slowly. They got, like, three hubs. And then the goal was, you know, three years later, get a few more. You know what I mean? And if you are a large country and you need to solve a problem at a large scale, you need to solve, like, health burden at a large scale, you want to do that a lot faster. You don't want it to take a decade. A lot of people die over that decade that didn't need to.

And so I think if we want – you know, we are seeing governments in Latin America and Asia Pacific, also a lot of government in the Middle East and

Europe. You know, kind of everybody is, like, well, when are we getting our Zipline? And, yeah, and I think that – I think that if there's a desire to solve TB and, you know, and maternal mortality in other countries too, we're going to – we should look at expanding the infrastructure there too.

Dr. Morrison: Now you own the technology. You do the training. All of your employees are African. But you also offer ownership shares, right? Talk about that. I mean, when I look at this and I think, OK, this is a – this is a service that's embedded within the government. It's paid for by the government. But they're saying we're – in effect we don't need to own this technology. We want this technology embedded within us at an affordable level. How do you motivate them to not want to push for, in this era, control of that technology? Because inevitably there are going to be calls for that to happen. One strategy is to have share ownership.

Ms. Burton: Certainly, yeah. I mean, I think Zipline has been really careful about how we are building this. We're trying to do it the right way, so that we can benefit the most people. I think that the reason that we hire entirely locally, we don't have a single expat in the Africa business, is because we want this money that governments are spending on using the service to stay in that economy, right? And so that money is paying for utilities and taxes and salaries locally. And it's being spent right back there. You know, I don't know what tech transfer looks like if it's not that. You know, we open up our sites for school tours and community tours. Lots of people have exposure to robotics they would never have seen or touched. That's all a really important part of how Zipline operates.

And, yeah, certainly ownership can accrue in many different places. It's not just investors in Silicon Valley that are financing the building of this company. You know, like, we – strategic investors is a – you know, we're approached all the time by strategics in different countries who want to be able to use Zipline and also maybe partner with Zipline that way. And we would – you know, we very much welcome that, because we think that – you know, I don't – I think that when a when a technology of this kind, which is growing really rapidly, like, for profit in America, can provide this kind of level of extraordinary impact, and it can also – but it's – you know, but we're not without the ambition of making money there.

And that government can – like, can kind of accept that, and pioneer that, and solve their problems with that, I don't think they really want to then own the technology. They don't want to own a giant, like, fleet of autonomous aircraft, and the training and the maintenance and all those things you laid out. They don't want to have to maintain the technology. They want the technology to simply work. They want it to do its job, which is what we promise them, which is teleportation, a hyper-reliable, responsive health system. And if they are – you know, I think the incentive, if you come on – if

you come in as an investor, that just means that, like we double win. You know, we get to solve – as an African government, we get to solve the problem, and we get to financially benefit from owning a piece of it.

Dr. Morrison: You talked about this as a form of commercial diplomacy, a different model. I assume what that means is that you're advancing U.S. foreign policy goals and you're advancing the foreign policy and security goals, at the same time that you're benefiting U.S. industry, manufacturing, employment, innovation. Say a bit more about that. And do people understand what you mean, when you talk about commercial diplomacy? Do they see this as a Trumpian concept? Or is it something that we've talked about in many other contexts?

Ms. Burton: I mean, African governments have talked about this. You know what I mean? They've talked about this for a long time. Trade, not aid. It's the same concept. They want the best of what America has. They want technology. They want innovation, jobs, entrepreneurship. They don't necessarily want us to export NGO-led health programs that have, you know, some shot at succeeding or solving a problem, you know, and then potentially being handed over to them. You know, like that's a – it's a kind of a long-term, complicated model.

If they can have what we have, you know, if they can have the best technology out there and they can solve their problems with it, they can do it affordably, America, on the other hand, can have a bunch of jobs. They can have reindustrialization. We can have robotics manufacturing at scale. That's commercial diplomacy. That's a win-win. We're giving – we're treating our allies like equals. We are giving them American technologies that solve their hard problems, that they're willing to pay for. They're getting great jobs. We're getting great jobs. They are stronger trade partners because of it. You know, they're stronger allies because of it. We're winning together. That's an alliance. I think that's how they want to feel.

Dr. Morrison: And here in Washington, up on the Hill, and talking to other constituencies, does this have bipartisan support? Does this have – is it treated with suspicion, when you start talking about commercial diplomacy? What's the reception?

Ms. Burton: I think I'm surprised. I think it has a lot of bipartisan support. I was just on the Hill yesterday. I met with maybe 10 different offices. You know, at the end of the day, Zipline is just out there trying to save lives. That's the purpose of the technology. I think we are doing it in the best possible way. We are doing it in a way that's completely locally led. We're doing it in a way where the value accrues to the countries. We're doing it in a way that solves problems. The ROI is we have solved this problem. You don't have to keep attacking that problem with, like, \$50 million grants here and there that are kind of one-off

shots. You know, like, you just solve that problem with the technology that's already proven it does that at scale.

I don't think anyone's mad at that. I don't think anyone is, like, let's pull this technology out and see what happens to the women in childbirth. You know, I think that – I think that we can all agree that this is a good thing. I think we can all agree that foreign aid is a good thing, and that foreign aid should be used effectively. And if it can solve problems, like, let's do more of that.

Dr. Morrison: Thank you. There's always been questions around cost effectiveness for this type of delivery system. Certainly 10 years ago when we were looking at this, it was just an open question. There's been a lot of independent analysis done in the last couple years. Say a bit about that. It's not just your data. When you go and read press accounts around this, or other deeper kind of journalism around this, there's a lot of analytic work that's been done. Who's doing this work?

Ms. Burton: Yeah. That's the peer-reviewed literature. I mean, there's a lot of people that want to do this work. We try to give exposure to our technology to young researchers in the countries we're operating in, because this is the only system of this scale in the world and we want those people to be able to produce novel research and build their careers on it, if that's what they want to do. So we're trying to – that's a really important thing about how we operate in these countries too. A lot of donors have wanted to fund this. They want to fund operational research and see if the model truly is impactful, if it truly is cost-effective. A lot of universities and third parties want to do research on the system. Ph.D.'s all over the world are doing their research on the system.

It's how we learn. Zipline's not trying to hawk its technology for fun. It's not easy to build. It's not easy to produce. It's not easy to integrate into governments at this level. It's not easy to continuously educate, you know, and learn, and then repeat all across the countries we're in. We are doing that because that is the goal. The goal is to make this technology – to make sure this technology is being used as effectively as possible. So if we've discovered something somewhere, everyone else is going to know it.

Dr. Morrison: What's the data showing you in terms of problems, persistent problems that you need to really prioritize?

Ms. Burton: I mean, I think –

Dr. Morrison: That you didn't maybe fully understand before the analysis?

Ms. Burton: Yeah. I mean, the first piece of research we ever got showed that we reduced missed opportunities to treat X, Y, and Z. You know, we had like a 66 percent

decline in missed opportunities to treat severe malaria, 44 percent decline in missed opportunities to vaccinate. We didn't see that coming. Like, we didn't really know what the research was going to say. But it said we had this extraordinary impact on these things. And that was just purely based on organic utilization by health workers. So health workers would order things from Zipline, and if Zipline didn't have it we would go tell the health system. We'd be like, hey, we get – here's, like, a big, long list of things people are asking for that we don't stock. And they would change our stock. And then we would just kind of learn.

But no one was saying to the health workers, make sure that if you have a kid who wants a vaccine and you're stocked out, you order it. Don't turn that kid away. Don't tell them to come back another day. Like, get that kid treated that day. No one commanded that, or wrote that down, or said that's what it's for. And so, people were just kind of using it randomly as according to their best judgment. What we know now, after all this research, is how to reverse engineer some of these outcomes. So what we encourage governments to do is use it in specific ways. We want them to learn. Like, the learning is still a really important part, learning and iterating and making it better and better. But once we know, use it for that.

We were talking earlier about the blood use case. We know that the blood use case saves – it almost virtually eliminates – like, virtually overnight eliminates postpartum mortality. And that is a sticky problem everywhere. We haven't solved that really beyond Rwanda at that level. And you have a lot of donors who are trying to solve that problem, but they don't look at this solution, even in countries where the governments have it at scale. It's, like, not on their radar because –

Dr. Morrison: It's a hard problem.

Ms. Burton: Yeah, it's a hard problem, but it's actually not that hard. (Laughter.) When a person is hemorrhaging, they need the right kind of blood.

Dr. Morrison: Yeah. They need a system too.

Ms. Burton: Yeah. So what the Rwandan government published in The Lancet. Like, years ago, is that on-hand inventory went down by 62 percent when they got Zipline. So hospitals have 62 percent less blood on hand. But waste went down by 67 percent, because more of that blood was being used. Treatment rates went from, like, 70 percent to 98 percent. And maternal mortality was cut in half. Like, the system worked. They used the blood more efficiently and fewer people died.

Dr. Morrison: Thank you. One of the things that jumped out to me in reading through many of the more recent clippings and things on this program, you've got some

very important partners working with you. Gavi, the Vaccine Alliance perhaps being the most important. But there are others. Africa CDC is very important. Talk about their roles. It seems to me they validate this work. They give you legitimacy and standing, terribly important. They extend reach. They bring knowledge and expertise across a span of things. They open a way of introduction to any number of other places. They have a vast experience. And so, where did the – where did the Gavi relationship come from?

Ms. Burton:

The Gavi relationship kind of came, it came from the start. Seth Berkley was the head of Gavi at the time. And I think, you know, there was an era of piloting and innovation, and people wanted to know. I think, you know, now we're in the area of pilot-itis. You know, people want to see pilot scale. But back then, pilot everything. So Gavi kind of came in as a pilot partner. They helped us with our very first setup in Rwanda to see what would happen. You know, like, can this technology even work? Like, you know, nobody knew if it could be robust and reliable enough to do its job. So they took a real bet on this. To their credit, when they – when they saw that 44 percent reduction in missed opportunities to vaccinate research come out, they were like, that's what we needed to know. We needed to know what the effect was going to be, you know?

And once they saw that, then some health economists looked at that and they were, like – you know, actually so once we saw that, we wanted to know what the effect on immunization rates was. And in the region where that effect was observed, we saw that immunization rates increased by 13 to 37 percentage points, depending on the vaccine. And that's pretty profound. And that happened during COVID, too. Everyone else was backsliding, and Ghanaians were getting vaccinated better than ever. And so I think Gavi was like, all right, let's apply a cost lens to this. And they found that that is 66 cents per fully immunized child. That was also the least expensive way to fully immunize a child.

And so when Gavi got this preponderance of evidence, they were like, well, any country that wants to use it, we're going to support that. And so countries were adopting Zipline. Countries were getting support from Gavi to accelerate the vaccine use case and make sure that they launched that from the start, really realized the maximum value of that from the start. And we've seen a profound effect because of that. We talked about this 42 percent reduction in zero-dose prevalence in some of our states in Nigeria, thanks to Gavi. ELMA Philanthropies, Pfizer, UPS Foundation, others have all supported that work. And I think that's because they know that it's solving that problem. They want the government to be able to do that as fast as possible and realize that benefit. And once it's proven, the government absorbs that.

So, you know, I think the most important role that donors have played – donors like Gavi, Elton John AIDS Foundation, the others I mentioned – is

they haven't undermined the government's investment in its own system. And that's really our – it's always been our biggest ask. It's, like, the government has adopted this technology, and you keep investing around it as if it's not there. They're spending their own money on this. They're trying really hard. You know, they have conviction. Like, try to, like, let them realize the gains of that and see if it works, right, instead of dismissing it out of hand and spending a lot of money to build around it. Gavi didn't do that. Elton John AIDS Foundation didn't do that. Pfizer didn't do that. UPS Foundation didn't do that. That was the greatest gift that you could have given to a government that was trying to do something itself.

Dr. Morrison: Yeah. Thank you. Thank you. Drones are controversial, right? I mean, they've risen to dramatic prominence in the discussion of warfare in the Ukraine-Russian war, in the Middle East, in the Iran War. How do you deal with this? And you're not on the edge – in Rwanda, you're on the edge of another kind of war, which we can talk about, but are people fearful? Are they skeptical? When they see drones in the sky, are they – how does this work?

Ms. Burton: I mean, you know, the first thing I thought of when you asked me this question is, like, the babies out there that are named "Zipline." Like, there's a good number of them. (Laughter.) You know, that that kind of community acceptance takes time. People need to learn what the system is. But I think, by and large, Zipline – I mentioned before, we're very open with the communities. We welcome them in. They're open doors. We want people to be able to come see the technology and learn from it. Yeah, I mean people hear the drones overhead and they know that that is an ambulance in the sky, and they know that it's delivering medicine. They know that it's saving somebody's life. And so I think if you go to any of the communities where we're working, and you ask somebody what's going on up there, they'll be able to tell you that. And we work really hard at that part of it.

Dr. Morrison: Yeah. On the Rwanda issue, I mean, Rwanda's very special place, right? I mean, they're high performers technologically. They're high performers on innovation in health. They're exceedingly well organized. It's a very autocratic place. It's a very authoritarian place. On the larger format, it's extremely controversial because it's the major supporter and influence of M23, which now occupies much of the Kivus. Goma Airport, closed. Bukavu Airport, closed. This is the – this is the domain now of the most significant and serious outbreak of Ebola, just acknowledged back in mid-May. Access is difficult. There's calls for ceasefires. Those are going nowhere. People don't know what to do.

So it's a tricky thing for you, it would seem to me, to have Rwanda as your key partner, when there's this other side of its of its behavior and the U.S. government is imposing pretty tough sanctions on Rwanda from March of

this year, because of its destabilization of the Democratic Republic of Congo. Do you just, like, carry on, and this doesn't really get in the way?

Ms. Burton: I mean, Zipline – I was mentioning before that we are part of the Regional Economic Integration Framework. You know, and where they put this third hub was pretty symbolic for them, building this critical infrastructure on the border, wanting it to be a sign of lasting peace. They have deployed Zipline to support the Ebola response. They are making sure – a lot of people come to those border clinics to get treatment. And, like, Zipline is really heavily supplying them. We have, like, a data system to help us understand what's being requested and where, where are the hotspots emerging? I think that they're doing a really good job of trying to create access to health care.

You know, like, that's – from our vantage point, I think that those steps are really important. Maybe they're only symbolic, but I think we can see that the way that they're using data and the way that they're using the system to make sure that health care is available in the border areas shows that they're investing significantly in infrastructure that is going to make the region – you know, regional health security stronger. So, like, Ebola is not just a problem beyond their border. Ebola is a problem for the region that they want to support a response to. And, yeah, and the investment of building Zipline in places where you know, we could become completely worthless if GPS jamming and these sorts of things are extremely prevalent in that area. And there's no point in putting critical infrastructure somewhere like that. So to us, that that tells us that they're meeting their commitments, in some respects, to lasting peace.

Dr. Morrison: OK.

Ms. Burton: Yeah.

Dr. Morrison: I want to ask you a question about the United States. I want to also encourage anyone who would like to come forward, pose a question, just come on up to the mic and we'll get to you in just a minute, and we can queue up there.

My question to you about the United States is something we chatted about a bit earlier. The work that you've done over this past decade in Africa, it seems to me, has played back and proven something, and inspired something in in this expansionary strategy that Zipline is now unfolding within the United States. Is that true?

Ms. Burton: Definitely.

Dr. Morrison: And if so, explain how this is happening.

Ms. Burton: Yeah, I mean, absolutely. So we've been – we've been delivering health care in Africa for 10 years. And certainly partners in the United States were, like, well, how can we access this service? We need this to accelerate our business too. You know, we need to make sure that we're able to serve populations who are farther afield, people who don't go to the pharmacy or the clinic as often as they should, and are getting more care in their homes. There's been a lot of that kind of shift to home-based care in the United States. But, you know, on top of that, I think instant delivery has become a growing thing at the same time. And we're doing it in very inelegant ways. We're doing it in – like, you know, like, we're adding more people to the roads. We're adding more, like, robots to the sidewalks. People are jumping out of the way –

Dr. Morrison: The gig economy.

Ms. Burton: Yeah, into the bushes, trying to, you know? (Laughs.) Like, you know, there's better ways to do that, too. And I think that in this moment where you have widespread adoption happening in Africa, and, you know, calls for companies in the U.S. to be able to use it, and the U.S. government has been a fast follower in terms of regulating it, you know, they're learning now how to regulate autonomous aircraft at the scale that Zipline used to operate. And then I think that's all – like, all of that traction is then causing this kind of wave of inevitability everywhere else.

So that's – I was mentioning before all the kind of inbound interest we have from places like Latin America and Asia, but now also Europe and the Middle East. A lot of folks have – here and there they've tried drone pilots, and for some reason they don't take off. We were talking a bit about the complexity of the systems. It's not really the drone. It just takes a lot of work to enable this to happen. And so I think people are like, well, we wanted it then. We want it now. Is now the time we can get it? So, yeah, that's certainly happening. Zipline, our, like, operating plan keeps having to grow because we are seeing how that the future is unfolding faster now.

Dr. Morrison: Tell our audience, like, what's the scale of your goals now in the United States? In what period of time?

Ms. Burton: I mean, I think that the thing about this company is that, you know, the operating plan changes really fast. And we need to be able to be responsive to that. I think we set out this year – we were talking earlier about how we set up this year thinking we needed to make enough aircraft to do a million deliveries a day. And that was this –

Dr. Morrison: Across the United States.

Ms. Burton: Across the United States. And that was a huge ambition, you know?

Dr. Morrison: How many are you doing today?

Ms. Burton: Many thousands, but not a million.

Dr. Morrison: Yeah.

Ms. Burton: And then one customer came in and bought all million. You know, they were, like, we want a million deliveries a day from this technology.

Dr. Morrison: This was Uber.

Ms. Burton: Uber, yeah, that's right. And so really quickly our operating plan changed. You know, like, we – there are, like, many other Ubers out there. I think that we're seeing this increase in deliveries from, like, you know, next day or two day delivery, to 30 minute delivery, to 10 minute delivery. People are consuming a lot of things more quickly and more locally. And so, like, you can't really add that many more people to the road. And you can't really add that many more things to the sidewalk. And you can't really take up that many more parking lots. You know what I mean? There has got to be another way for the technology to evolve. And so Zipline is trying to grow as fast as it can.

Dr. Morrison: Now, there's been a very strong move, shift of opinion in America, left and right, against datacenters, and against AI, and big tech. And it's going to – beyond what most people had anticipated. And now there's all this discussion about how this is going to emerge as a dominant preoccupation in this electoral cycle, and into the next big national electoral cycle. How do you look at that? Because if you're going to go to a million or to 10 million – let's say now Uber came in and said, yeah, fine, we'll take those. And now you're, like, well, I guess we better go bigger than that. How are Americans going to respond to seeing thousands of drones up in the air? I mean, yeah, the roads are crowded, but they may not – you know, when they put the big technology around renewable wind energy across America, there was quite a debate, quite a reaction. What are you anticipating?

Ms. Burton: I think people kind of picture this different than it is in reality. Like, when I'm – when I'm approaching a hub in in Rwanda, for example, where they're doing probably 4(00) or 500 deliveries a day just from that one hub, every few seconds something is going out. And you'll be like right outside of it. And people are all looking for the drones. And you can't see them. The drones are really high up in the air. And they're, like, white on the underbelly. And you're – unless it's, like, nighttime and you're spotting their little lights, it's really hard to actually see them. So I think – you know, I think we're kind of picturing the sky being crowded by a million deliveries a day, and it's not like that. The drones also stay up really high. And this little – this cute little droid comes into your yard and delivers a package. You don't hear the sound of the

drone and you don't have big propellers and other kinds of disturbances or safety issues in your yard. You have this cute little droid.

Dr. Morrison: I've seen this thing tethered coming down from a thousand feet.

Ms. Burton: Yeah. Yeah. It's like somebody came and gently placed this here. Our goal is for people to not really notice how that product got there. Like, I don't – like we were talking about before, I don't think – Zipline has a very high net promoter score. People love the technology. People love getting deliveries from Zipline. We have grandmas who have used – well, we have a grandma who has used it, like, 350 times in a single year. She's a prolific user. She's like 85 years old. And –

Dr. Morrison: What does she get?

Ms. Burton: I mean, lots of things. There was this one guy who was ordering Ben and Jerry's every day. (Laughter.) And like so often that, like, one day he stopped and the team, like, reached out. And they were like, are you OK, bro? Like you didn't get your ice cream for the last two days. You know, like there's this, like, really interesting customer habits. That's another reason we needed to get to a million deliveries a day faster, is people are using it way more than we expected. People like the technology. And so I think there's some towns that we deliver in where more than 50 percent of the households are using Zipline regularly.

And so I think we can imagine all sorts of things about what this is going to be like, but when you're actually using it we have pretty great feedback from the customer. We built it around 10 years of customer feedback. We're being really intentional about the design to make sure that people like what they're getting. And so I think – you know, I think we should all use it before we decide what how scary this future is going to be.

Dr. Morrison: Now, some of the other big firms – Google, Amazon – are now in this area. What does that mean?

Ms. Burton: I think it's great. Competition is a good thing. I think more people – you know, like, if Google and Amazon are getting involved in this field, this field is probably happening. You know, like, Zipline as a startup who was one of the first in the space. You know, it's pretty extraordinary to see, like, I think that level of buy-in happening. Yeah, I mean, I think it's a great thing. I think the more demand there is for this kind of a service, the more regulation will catch up to speed, the more communities will provide feedback to all providers about what it is they're looking for, the technology will get better faster. And, yeah, you know I think it's a really important thing to accelerate the industry.

Dr. Morrison: And what are the odds that you'll be bought out?

Ms. Burton: Well, maybe we'll buy them out. you know? Like, I don't know. (Laughs.) I would I would try to buy Zipline, if I wasn't here. (Laughs.)

Dr. Morrison: So if there are any questions, please come forward. Otherwise, we're going to just keep – we're going to just wind up here. What leaves you awake at night? What are you most worried about? Back to the Africa part of this.

Ms. Burton: Yeah. I mean, it really is, like, the speed with which we can deliver wins for this new policy era, so that we don't – we aren't tempted to go back to an old version. You know, I really think that letting governments kind of lead the way and invest in solutions that are actually working, it's a really good and efficient model. And I think that we have a very limited window to display that, right? Like, you know, we're not – we don't have an infinite amount of time to show that they really did put this in their budgets. They really did spend their money on it. It really did solve the problem, you know? And so we're all racing as fast as we can to make that happen.

I think that other technology makers who already have been prolific builders of things in the world will also try to provide this technology to all of our allies. You know what I mean? And so I think that we – it's a race against the clock, basically. And I hope that the focus on like doing the most – the utmost with foreign aid, the best for America and the best for our allies, if that remains the objective for everybody we're all going to be fine. But that's what keeps me up at night. I don't think it's always the objective.

Dr. Morrison: How do you prepare for change of governments, critics emerging, folks objecting to this? OK, this was successful for some prior government, so we don't like this anymore? I mean, that's a problem in any one of these countries. You also have to prepare for a transition here and make sure that that bipartisan support continues. But how do you – how do you prepare for – politically – how do you manage politically what's inevitable in terms of change of power and change of perspective, and folks going, well, that was the last government's priority, and it's not going to necessarily be ours?

Ms. Burton: Yeah. I mean, Zipline has never really invested a ton in marketing and communications. You know, I think we are just – we heads-down doing the work. And we probably haven't done enough to win the hearts and minds of people whose lives are being saved. I think every community receiving these deliveries understands it, but, you know, folks in in cities who don't have Zipline and are hearing from politicians their opinions about it, or assertions about it, you know, like, that's the electorate a lot of times, you know what I mean? Like, those the people who are donating to political candidates or are or are the loudest in influencing people.

I would like – you know, I think Zipline can do a better job of making sure everybody understands that we're just out there trying to save lives. We're not owned by any politician. We're not we're not part of any political party. We don't have any political designs. We are just infrastructure. President Mahama said – you know, there was a quote that I, like, need to frame. It was just really basically –

Dr. Morrison: President of Ghana.

Ms. Burton: You know, infrastructure is national progress. It's not politics. And that – you know, that's kind of the best way to sum it up.

Dr. Morrison: What would come next, do you think? Let's say, OK, three years or two years from now, plus a few months, the three-year agreement's done.

Ms. Burton: The governments will be –

Dr. Morrison: Where are we going to be? And we're going to have a new government here. What do you imagine as the options at that point?

Ms. Burton: I mean, there are many ways it can go. But I think the outcome that I'm looking for is this technology is operating at national scale in the countries that have it. It is having a profound effect. There's going to be this before Zipline and after Zipline effect, where population health problems get rapidly caught up on, rapidly solved. More countries have gotten it in other regions. More countries in Africa have gotten it, because they want it and they are willing to put their budget into it too.

And, yeah, and we're able to also, I think, like, establish what Zipline is and is not a bit better, right? Like making sure that Zipline is operating in this neutral place doing the job it set out to do. And hopefully we are kind of decoupled from any party's agenda in any country that we are operating in today, or in the future.

Dr. Morrison: Well, thank you so much for being with us this afternoon and taking the time, and being so open and candid. And this has been a terrific conversation. We're very grateful. We hope we can get you to come back –

Ms. Burton: Anytime.

Dr. Morrison: – at another point and give us a quick update. Special thanks to Joe Foltz and Janice Beck, your staff who helped make this all possible; and to our staff here – Michaela Simoneau, Caitlin Noe, Sophia Hirshfield – who worked really hard to make this; and our production team, who put this all together. So, thank you.

Ms. Burton: Thank you too.

(END.)