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Transcript: Funding and financing strategies for smart cities

A webinar on financing tomorrow's smart cities ecosystems

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Rana Sen (Rana): Thank you Carl and thank you participants on the webinar. Thanks for your time. I believe we have participants from within US and outside US as well and along with my colleague, Michael Flynn, who is the Global Public Sector Advisory Leader and Steve Hamilton who is leader in our funding and financing practice. We are really excited to engage with you in our discussion over the next hour, present some of our thoughtware around funding and financing, and lesson learned and take questions as well and engage in our dialog with you. Carl, can I get the next slide please?

I'm going to set the context upfront in my capacity as the US State Sector lead for our transportation and smart city initiative, talk a little bit about the overarching notion of smart city, some of the challenges and opportunities, and then would request Michael to go through the creative funding and financing models that we have seen across the globe, some of the lessons learned. We all understand the complexity of these initiatives requires an ecosystem approach and Steve Hamilton is going to walk us through that component of the presentation and then we would leave about 10 minutes at the end for your questions, so that we can hopefully answer as many as we can. Next slide please.

In regard to the overarching notion of smart city, there are obviously various definitions, but essentially, we think about smart city and when I say smart city, it actually is inclusive of municipalities, of communities. And they have already embarked on their journeys towards a platform, which is interoperable, interconnected includes smart infrastructure, which forms the backbone and it has probably two main goals. Number one, to optimize the current assets, technologies, and processes to better manage and deliver services to the citizens and the residents, and the visitors. And number two, to continuously address the technology and other destructors that we are seeing happening all around us in the environment that we live in today.

So, with that being said Carl, if I can get to the next slide, we have seen five key drivers when it comes to smart cities. Number one, as we all are aware is the unprecedented urbanization that is going on around us, the world population has been increased by a couple of billion people by 2050. There

Funding and financing strategies for smart cities
A webinar on financing tomorrow's smart cities ecosystems

would be 43 megacities with over 10 million residents by 2030. Roughly, another a couple billion will move into urban areas by 2050 as well. And all of this obviously creates sustainability issues and even today three quarters of the carbon dioxide emission comes from urban areas. Thirdly, when it comes to safety and security, unfortunately we live in a world when both physical and cybersecurity are top of mine for all of us and the cities' municipalities, the local government agencies are working vigorously to help ensure that they are not just secure, but also vigilant and resilient at the same time. Transparency in government in an expectation of the citizens all around the globe of the visitors of all of us and along with that when we look at the technology disruptions, the innovation that is going on around us, expectations are being modified, are being influenced in regard to how we expect the governments to provide services back to us to engage with us as citizens in the service delivery model. And when we look at the approach to this, Carl, if I can get to the next slide. We always think about the government acknowledging the focus on purpose of which there are three main ones. Number one, economic competitiveness, talent retention, job growth, opportunities for all, and being inclusive in that regard. Two, sustainability as I was mentioning earlier, we need to make sure that we live behind a planet where others can live and prosper as well. And third, improving the quality of life for all and that is important in regard to making sure that we don't create digital divide through this process, but being inclusive and making sure that the entire population is accounted for. And with that purpose in mind, we also understand that being smart inherently refers to integrated technology platform to better help, manage, and deliver services as I mentioned earlier, but we also understand that John Doe or Jane Smith, they would live on (?) (07:37), they don't really live at department of transportation or department of state or department of education. So, when we look at the initiatives, we look at it across six different domains, but more or less all of them have correlation or interrelation, interdependency between them. So, we talk about mobility, we just don't talk about transportation because mobility is about movement of goods and people from point A to point B in a timely safe and reliable manner. We talk about security, we talk about education, living environment and economy, and all of those domain areas really focused back on the 'who' which is the constituent, the resident at the end of the day. Next slide please.

And to accomplish these complex set of goals and objectives, and given the drivers that are involved as well, we believe that we need an ecosystem and you will see us highlighting five of those on the chart and then they are government, citizens or constituents, academia industry, and nonprofit organizations. And each one of them would have primary and other secondary roles as well. So, for example when I think about the government, they have the role to set policy to make sure that regulations are up-to-date. They have the responsibility to be the stewards of taxpay as money to protect the citizens, and also provide goods and services when there is no business incentive, but when it comes to the business, to the industry, they are not only involved in innovation, but also operationalize the IT around innovation. They provide goods and services for a return. We look at academia to generate new ideas and test new ideas in a safe environment, which can then be taken by the business and by the government to operationalize and also provide an efficient and effective service to the citizen. And the constituent of the citizen is really creating that demand for goods and services, which then obviously drives IT

Funding and financing strategies for smart cities
A webinar on financing tomorrow's smart cities ecosystems

and innovation need. So, those are some of the roles that are played by the ecosystem players and again to be very clear, these are not watertight compartments, but there is a lot of overlap between these roles, but there are some primary focus areas versus secondary and tertiary focus areas. So, with that been said, let's launch into the core of our presentation, given this context. And before I request Michael to come on, there is a polling question, Michael, if you can go to that.

Polling question: #1

There is a lot of interest in smart city initiatives and as I mentioned obviously many or few around in your communities, in your municipalities, and cities have embarked on the smart city initiatives, but our understanding is that not many are gaining traction in the longer term, in a strategic way across local government specifically in US. Why do you think this is the case? And there are choices as you see on the screen.

• Lack of strategic roadmap for prioritized initiatives
• Minimal focus on achieving stakeholder buy-in
• Governance challenges across multiple stakeholder groups
• Lack of leadership
• Lack of sustainable funding and financing mechanisms for these initiatives
• None of the above/not sure

If you can make your selection, it probably going to take a minute for the results to show. So, with that being said, again feel free to typing your questions on the prompt as Carl mentioned and while we are waiting for the poll results maybe Michael before you initiate your conversation with our participants as I can ask you a question, what do you see in your interaction with the financiers as to how they are viewing the smart city initiatives undertaken by the local government agencies across the globe?

Michael Flynn (Michael): Thanks Rana, and good afternoon everyone. From a financier's perspective, smart cities is a combination of infrastructure and technology. Delivering citizen services and then this increased focus on sustainability. And, so while infrastructure is a very well understood asset class and financiers are comfortable with that on the long-term nature of that. The involvement of technology is one of the issues that's causing concern for financiers and something that they got to get used to. I mean in overall terms infrastructure is a relatively new investment class and smart cities will eventually get there and what's clear is that technology is there to stay and is going to be a core component of the future cities and future infrastructure. So, the financiers are having a few issues in terms of getting around that short or long-term nature, it is something that they are going to have to get used to and then how they interact with the public sector and from a cities point of view again something that I will touch on that over the next number of minutes.

Rana: Thanks Michael, and I do see that the poll results have started to come in. We see that roughly 42 percent of participants have indicated that "Lack of sustainable funding and financing mechanisms" is one of the primary reasons. About 25 percent have voted for "Governance challenges" and we see about 17

Funding and financing strategies for smart cities
A webinar on financing tomorrow's smart cities ecosystems

percent have indicated "Lack of strategic roadmap" and then about 7 percent for "Minimal focus on achieving buy-in" and about 11 percent "Lack of leadership." So, with that, I think clearly it establishes the context for Michael what you are about to get into from a discussion standpoint, with that let me hand it over to you.

Michael: Thanks Rana. I'm great that this is relevant and people seeing that this is one of the issues because when we talk to our clients about smart cities, apart from that clear demand that interest in, there is an overwhelming issue raises, it's how do we pay for and the need to solve this point is demonstrated by the core macro drivers, urbanization, sustainability, private sector participation, and technology. Every week, 1.5 million people around the world moved into cities and as Rana told about the numbers, about two-thirds of the world will live in cities by 2050. So, from a public-sector point of view, there is a huge demand on infrastructure, but also if you can solve the city infrastructure issue, you are solving the infrastructure for … significant part of the population. There is an increased focus on sustainability, so globally with the Paris agreement UN and sustainability, it's SDGs which are setting out clear plans and steps in terms of how this should be implemented. But you then look at the public sector, and there are funding deficits in virtually every nation around the world and how the projects, the infrastructure that's required in the cities development to underpin the sustainability and the urbanization, it causes a funding gap. Now, how you fill that, is going to come from private finance and thankfully with SDG 17, is where the first time that this plan has recognized the need for private sector involvement in public sector and service delivery, and that's a good thing, so the acceptance of profits and generating profits from those services is acceptable. So, citizens are getting more, more use to having technology in their every day and the expectation is with the internet of things and all of those connections is that you have technology in your infrastructure as well and technology on your day-to-day work, so how you mix that infrastructure and technology together is one of the challenges that financers are struggling.

Going to the next slide, irrespective of the inclusion of technology in projects, infrastructure finance is still complex. You are dealing with long-term projects. It needs to be managed carefully, but if it's well designed and well procured, is deliverable from the public sector, but the inclusion of technology causes additional challenges within smart city projects, and given the link with infrastructure public sector, it tends to be infrastructure investors and financers who tend to get approached and on our initially targeted for these projects. So, the initial challenge for these investors that are used to 20 or 30-year transactions, it's how they now consider technology which is a far shorter lifecycle. And we don't know what technology is that going to be there in the next 10, 15 years, and so they need to address these issues and number of their investment mandates may not include technology and so, some of them have to change how they are approaching their business. As I said, this is something that they need to address. They need to consider technology lessons upgrade, replacement, and who owns the IT when it's been developed for a city project. Certain things that they wouldn't necessarily have thought about previously are going to involved in project. Also, the revenue models are slightly different, because previously in infrastructure project, potentially there is a tall or certain income that's identifiable or you are getting paid from the

Funding and financing strategies for smart cities
A webinar on financing tomorrow's smart cities ecosystems

public sector. When you throw technology is the mix, we know from older services that we are getting that are purely private sector. There are many different revenue models that are available and how you bring that into a long-term project and get a financier comfortable on the risk associated with that revenue is critical and the end result, solutions are more likely to be a blend of financiers where you can get short or long term to gather and that's going to involve a mix of one of our traditional financiers, but also alternative blenders maybe service providers, and I know that's Steve will take up on that later on. And the other business is in terms of the procure methodology. So, often times we call the technology as a trial or pilot that's included by the cities. One of the challenges how you move from pilots into full implementation across the city and rollouts, and the type of companies that are interested in getting involved in pilots are not always the companies that are capable or up the scale in terms of doing full roll outs across cities and have the financial strength, and so finding ways of procuring that you deal with that pilot versus roll outs overtime is important. So, next slide. Before we move onto, as we look up the ways how we solve these challenges. Second polling question that you might come back with the responses.

Polling question #2:

Which of the following do you think makes it difficult to finance smart cities projects?

• Risks inherent in new technologies
• Poor credit ratings
• Multiple stakeholders with multiple agendas
• Lack of clear business case/model
• All of the above

You can go back and answer those questions on the polling. While we are getting the responses back. Rana, I'll throw back a question at you and you talked about the stakeholder involvement of the challenge of that, how do you say that they challenge for stakeholders in getting involved in these new models for smart cities?

Rana: So, thanks Michael. I think a couple of things, number one is the knowledge sharing around what worked and what hasn't worked. I think there is probably a lot of initiatives around, funding initiatives, financing initiatives, the traditional P3 model, some of the more creative ones as well, which have been successful, but I think the others which have been deemed as failures as well and as I mentioned before I think from especially a government standpoint and then in their role around being stewards of taxpayers' money, there is probably and naturally so, healthy pause around what would work and what wouldn't work and to the extent that the ecosystem partners can help, mitigate some of those risks and concerns I think would go a long way and making sure that some of those challenges are resolved.

Michael: Thanks Rana, we should have some poll results there.

Funding and financing strategies for smart cities
A webinar on financing tomorrow's smart cities ecosystems

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Rana: Great. So, I think what we see in this regard is that, we have about actually 58 percent saying all of the above, which includes risks, poor credit ratings, multiple stakeholders with multiple agendas, and lack of clear business cases. And I think we see about 18 percent with multiple stakeholders with multiple agendas, being the next one, about 15 percent of the participants have indicated that lack of clear business cases is making it difficult for smart city projects, and then we have 8 percent saying risks which are inherent in new technologies, and about 3 percent indicating poor credit ratings as making it to extremely challenging for smart city projects, Michael.

Michael: All right. Thanks Rana. And it's great that we continue the points. On the next slide, we set out to address these smart cities financing challenges. We developed a process to ultimately develop, implement projects, and again how to design private sector involvement, private sector participation in projects. So, we have 3 steps in this. The first is understanding the project and the value being created, second is considering funding and financing options, and then lastly looking up the relevant procurement and delivery method. Over the critical P3s, we are not trying to leave to the delivery model in advance of understanding the projects and the cash flows because we want to design something that can actually get private sector participation and addressing the issues that we talked about previously. So, the first phase is understanding the business model, is a detailed review of the financials in particularly the timing and the cashflows, and would a lot of focus on the revenue model, and ultimately determining what is the capacity for the project and its cash flows to sustain private capital. The next is understanding the value generated, and what we are trying to upfront here, we are looking at what are projects invested, what value is created elsewhere directly by the project or indirectly, and how could not be captured, we come back to that. It's then that when we understand the cashflows, we understand what value is there, we understand what capital amounts might be there, then we look at what funding or financing available, what is the most suitable to do to address that, then we determine what the delivery model is. We try not to jump straight to that conclusion. So, we are not start going in, talking about we are doing a P3 project and we work from there, not maybe the solution, but we want to get to that point on a process.

So, on the next slide we look at one of the challenges that is inherited in smart cities, is looking at that revenue model. And question, who should pay is key, financiers to be honest would always preferred the public sector to assume the revenue risk, so that it's a stronger covenant, greatest certainty, but this can do always suit the public sector and there were times when others should pay or at least to pay some. So, when you look at as a payment, can it come from the end user or is there third party willing to form the service for example advertisers because they are getting an access to end users and however, ultimately our advice around revenue is that you got to start with the ended mind, because if you are giving a service and you start giving it for free is very, very difficult to start charging it afterwards. So, therefore starting even with a low charge, something that as you may introduce sets the right behaviors. The other element here is looking at a hybrid where you may guess third party income or end user income, but there may be because of the dynamics and the scale of the project, there may be a need for some government support, so the hybrid where there certain either guarantees or pricing support, which is

provided by government which underpins that revenue and allows that private finance to get it involved.

On the next slide, as I said we talked about value creation and often times the value generated from the project is only considered when the project has been delivered and at that point it's very, very difficult for public sector to get a share of that value created, and so what we are advising is an early evaluation of that value and looking either from a direct or indirect basis, and direct is a bit easier because you can see while I put in the project, I can charge for it, it's revenue, I mean when the private sector is involved and there is also ways where you can make sure that the transaction if there is enhanced value or enhanced returns from the private sector or these ways of getting shared of that back into the public sector. Indirect is slightly more challenging, but we are all aware that if there is an investment made in the city then generally, there is value created to all the parties that are around service of that investment. and the easiest example is transport assets where there is value in particularly on real estate enhancement on all of the real estate surrounding those transport nodes. Question is how do you get access to that and there are various ways of where it's rates, whether it's planning (?) (27:41) whether it's selling their space, whether selling development rights, whether it's doing interacting on that basis, but also as you do smart city, then there is more technology in there, so that if beyond the infrastructure piece, so you develop intellectual properties. So, what happens when the private sector then uses what they learnt in one sitting and sells it another, can you gain that share of that value, whether that by cash or in kind, as a public sector, can you look to get that, the value of the IP that's being used elsewhere and there getting a monetary gain. Can you get that true upgrades, new licenses, reduce costs, and so you are getting it different ways? And the last one is asset recycling, which has been used very successfully and particularly in Australia and Canada where there is often excess assets under use like the assets in the public sector, which have greater value if they are held by others, and therefore can you use cells or do long-term leases on these assets, get the capital value, use our capital to invest and do infrastructure, and then you get the economic gain, but also you can then recycle that again, and again, and again, and again, so you are using the same amount of capital that was previously underutilized assets and you start delivering (?) (29:05).

On the next slide, we have tried to put the financing wheel and we are looking at the different types of financing and there are many sources and there was plenty of capital around the world. It all depends on the risk, the tenure, the cash flow, the type of projects and as what might involve, and the inclusion of technology increases the likelihood that these types of finances will be blended, so if not just going to be your debt and equity, but there may be different types of debts, different types and as you can see in the wheel, there are certain types of debts, which also spread into that hybrid, so that somewhere between debt and equity and some of the Hollywood capital going, it will also provide equity, but it's because of that short term nature debts you try unstable touch on this in terms of the putting the model together that allows you that short and long term capital to deliver the infrastructure, but also deliver on the technology element. So, before we go up to the procure models, I throw another polling question to you.

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A webinar on financing tomorrow's smart cities ecosystems

Polling question #3

Are any of these revenue models in play in your community?

- Using advertising to support a service
- Selling an "all-you-can-eat" subscription
- Data monetization (e.g., selling data captured by a service to companies for marketing purposes)
- Pay-as-you-go user fees
- None of the above
- All of the above

Rana: And Michael, while participants are voting on that maybe I can pose another question in terms of your experience and conversations around the globe. Have you seen some of these revenue model approaches impact government procurement models also?

Michael: Yeah, so the risk associated with revenue is going to impact on what financing is available or the cost of financing or the types of financing whether it's debts, hybrid, or equity and that then needs, the procurement then needs to be structured to allow that preferred financing structure to allow the various sources to come in at the appropriate time. So, ultimately your revenue model, well it starts in terms of our process, it is very early on in the phase because it actually impacts throughout what financing is available and then procurement. So, it is critical, determining that revenue and particularly when you go out to the end user or third parties, it can be challenging to quantify on a projection basis, and how you get financiers with, comfortable on that level can cause the challenge.

Rana: Carl, do we have the results showing up? Great. So, as we can see roughly about 26 percent have indicated that all of the above models are in play and actually about 31 percent have indicated that none of the above are in play, it's an interesting fact for us to consider, about 18 percent indicated that they have seen pay-as-you-user fees, about 9 percent have indicated data monetization. This is one of the very creative aspects of revenue generation, Michael, if I may say so. And then selling and all you can eat subscription model is about 3 percent, and using advertising is about 14 percent is the distribution does far.

Michael: Right, thanks rana.

Rana: Yeah, one thing Michael before you proceed, would you be able to give a little bit of an explanation of "all-you-can-eat" subscription model?

Michael: Yeah, I guess it's a little bit like the Netflix type of things, is there a service that you are looking forward in a city that sometimes that can be linked with (?) (33:54) collection, it can be, but it's a pay monthly fee or fee on annual basis, it's used as much as you wish. It varies depending on usage and I guess the challenge is over usage or over sharing from a financier point of view

Funding and financing strategies for smart cities
A webinar on financing tomorrow's smart cities ecosystems

is what risks, if there is additional cost that comes with volume that maybe not be the preferred revenue model.

Rana: Correct. All right. Thank you, Michael. So, Carl going on to the next slide. This is the last piece of our process where we were looking at, there are many, many models in terms of delivery to get private sector participation and it varies in terms of level of involvement of both public and private. And as I said before the keys not entered the process with preconceived idea of the procurement model, need to understand, consider the appetite of risk for both private or the public sector, and its ability to transfer that risk and the capability within the public sector is also relevant. Sometimes there is a need for the public sector to involve the private sector from a skillset point of view as well as that risk transfer perspective. Risk transfer and need for innovation is likely to increase the level of private sector participation., but as I said there are very models and the critical piece is not to enter without predetermined decision.

Moving to close on the next slide. We often have a habit of just focusing on the project where cities are essentially a program of investment which need to be addressed, but going back to the early point, there is a finite public-sector budget and that needs to be spread widely across all of the projects to maximize the impact. So, while we look at the process, it's quite a similar process that we have, in terms of the individual projects, however if a city can look at this on a citywide basis, on a program wide basis, there is an ability to get greater impact and leverage the capital available. And so, for example the public sector can invest and get projects to a point where private sector participation maybe easier, maybe possible, can reduce risks, can make it bankable, in some ways they could build projects to a point where private sector participation is better or the level of returns for the risk rounded would be lower from the private sector. And generally lending or granting a supporting finance or revenue streams, helps to maximize the number of projects that could have been achieved and there are different models, I guess it's where the public sector can just provide and just a minimum amount to get it over the line to allow that private sector participation. It is deliverable in terms of the private sector finance into the smart cities projects, there is plenty of finance, there are plenty of projects. The challenge is to get the two to be compatible. Identifying the best model is a critical piece and there is a process to do that, but the inclusion of tech means that there is a blended finance solution and more required, the blended is required further and so including greater levels of alliancing and that sort of a nice Segway into a Steve's piece which picking up on the alliancing element, so Steve over to you.

Steve Hamilton (Steve): Great. Thank you, Michael. Thank you, Rana. Thanks Carl. So, I'm going to try to take this home for us and I will accentuate a few points that Michael made especially around really our public-sector stake holders, clients trying to drive the greatest value out of this ecosystem. It's like to be not giving everything away especially when you are getting into new firms' renovation like data monetization, what's that worth, what it means, how you share it, the cyber implications of all those things, those are really front of mind and that's something we are trying to help our clients, our partners through. And you go back to Rana's statements, I really like it earlier, the people live with the intersection of main intent, they are not living vertical lives,

Funding and financing strategies for smart cities
A webinar on financing tomorrow's smart cities ecosystems

they are not living one silos of transport, one silos of water, one silos of energy, but all these things are horizontal and also speaks to what we thought about the alliance approach, which is this ecosystem is very interwoven, it's also forcing disruption on traditional procurement models, where those have been historically a procurement a large engineering type procurement, well different types of design build approaches forward, the public sector looks a large program implemented delivery over 15, 20 years when infrastructure project with long stabilized returns, it's been entirely disrupted, and those are few other things, I think we will touch on here and talk about how the alliance approach speaks to that, so really in this report, we have just published it's really about how does collaboration work in this new model for urban financing, what are the types of partnerships that versing emerging where private sector participation is now going further and further upstream into public sector procurement including new model or shared gain delivery, shared value participation, we will talk a bit about that. What are ways you can make procurement a bit more nimble so that public sector can take on and share added forms of risks that deal with shorter, lessons of technology at a degree to which its interoperable or not and is there governance structure approach that we are now seeing that enables empowered champions of the city level connecting up to the mayor of the CTO, the CIO, whoever it is, giving them the right delegated exploratory to frankly work across the departments, alliance procurement models, and then think about piloting new forms of technology alongside infrastructure whether the shared benefit across the city system. So, that's not only that interacting with customers, citizen businesses, but it's also interacting directly across departments and making sure folks are working together. So, the four kind of pillars of the alliance approach are, what Michael discussed in great detail which is the innovative financing, bringing in private sector participance, thinking about new levels of return and risk sharing, and also this whole concept of collaborative partnership, which is really how do you bring the private sector upstream like you as the public sector whether it's a technology company, a strategy firm, a financing house, where do they fit and how do you align the business models in such way to make sure that their shared value for all, this is sustainable and worth doing. Dedicated governance again a champion or someone who can drive this process forward who is on the above responsible for and then nimble procurement, so what we done on report is we laid out the case studies, and we have kind of given some examples of how you get started which I will turn to next, so we get advance the slide, Carl, that will be helpful.

And just to talk this through a bit, how to get started that there is actually way forward, and we know that the traditional models of infrastructure finance will remain, we know in the US markets, for example if you have a strong credit rating, you'll have access to (?) (42:10) debt finance and in place around United States, we have seen general obligations bonds raised, it's hundreds of millions of dollars that are targeted towards smart infrastructure, but cities at all different maturity levels, there is all different levels of economic development, investment required, levels of capacitated implement, large a physical infrastructure, and technology programs. So, this is all about looking what Michael discussed, thinking about the optimal procurement model based on first looking at value and then looking at basically optimizing your financing capacity or position, but kind of a new innovative, kind of things we are seeing are enhanced vendor finance, so this would be an example of common and

Funding and financing strategies for smart cities
A webinar on financing tomorrow's smart cities ecosystems

street lighting systems, we are doing LED retrofits, we are deploying a wireless, a noise monitoring, air particulate monitoring, sensor technology (?) (43:02) while you are doing the LED upgrade. There are large vendors now who are able to use their balance sheet basically with a lower cost of debt finance, off of that balance sheet to do the city and then they will do all of the capex installation even some of the apex that's one way forward and then they will have a shared performance target around, it could be for LED, it could be cost savings with the revenue share once the vendor finance portion is paid out and there are other structures around it. I think one of the issues around smart cities in particular is bringing the people along, so that whole issue of equity and participation, one thing that's really interesting there is number of cities in United States, east coast and middle of the country in particular have issued minivans and this is basically low buy-in, basically $500 purchased buy-ins for individual bonds that are specifically targeted as parts of larger capital stocks to take the package kind of over the edge to get it to commercial financial close, and it could be reused to repurpose cultural facilities, it can be used to sort certain types of technology innovation across the city. So, minivans with the drafted yields that bring in 15 million dollars, 20 million dollars that help the city get started, bring citizens along, so there are willing participants in terms of what it means becomes smart reinvesting in assets. There is also a lot innovative and interesting application to concepts, which is land value captured, the more complex version, the more sophisticated version, taxes, (?) (44:40) finance, but the basic idea here is does the city on its own terms, does it invest in technology, infrastructure, fiber backbone for example does it invest in (?) (44:52) networks, does it invest in Cloud computing capacity or some element thereof and then offer that space where that infrastructure is, where is dummy investment and put it out to market to developers who will then pay for that value to impact payments or through some sort of concession or other model where they will then add an additional investment, putting the vertical bill, whatever it is the other infrastructure and there is a long term kind of management development agreement over that the property value, over that asset, and then what benefits the cities is actually the share of the increased value of the property, so they often see it in transit or at a development, but where you are putting in transit now you should be putting in cyber and you can think through the business model around that and to collaborate partnership, it relates that how you are bringing multiple vendors, you are bringing government together, a new business model, the gain sharing agreements, the performance based contracting, and actually moving away even say from more traditional capex investments, so this could be things like a manage services, 311 services, really interesting innovation models around mobility as the service and multi middle platforms where you have real time to managing systems where a citizen going from work from home, needs the staff at a grocery store, and their entire journey basically allows for the integration of different point-to-point solutions and you can make a choice, do I want to go home fastest, do I want to walk through a park, do I want to prioritize my journey home based on price, and then you can integrate in with retailers, but there is a long story there is spreading up something like mobility system involves tech providers, it involves mobility providers, the city bus system, the bike sharing, the ride-hailing- or ride-sharing systems, so how do you orchestrate that system, try these things and then is there manage service aspect where the city doesn't necessarily own the application, but your partner of a group or (?) (46:53) on the private sector side that actually does this and

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what is the business model and revenue share around that and that can include things like data monetization. On dedicated governance, you can go live globally if this was certain that we are seeing advantages when a city mayor or manager, delegate, responsible person or NCT that has the ability to cut through rotate, the ability to try and test new systems, new technologies, and even work across city regions, the road doesn't ended the county, the road doesn't ended the city, so, we started thinking about technology, and roads, and AV for example in the southwest United States, you are seeing a lot of interesting movements towards regional procurement models where we try something out of one part of a city desperate or county or outline city area, so and a different procurement regime they are looking to align in other areas, so something works in county A, county B is brought into that agreement, and you can immediately move over and replicate that agreement and use it without having go through a long procurement cycle, but again that's deploying someone or something giving them the power and capacity to make some decisions and move things forward and then finally nimble procurement, we would say here, if you are looking at RFIs really incorporate the partnership angle in early get it up there upfront, get the ideas around, and what we as a city are going to put in or what we as a county are going to put in, in terms of access rights, in terms of is it initial C capital, is it brand capital alongside of the development partners to get things moving and then see what the market comes back with in terms of what the partners are going to bring back to you and both at a pilot level and then as you are scaling up over time and this is really critical, getting into issues like fair competition, how do you structure deals in the frontend that allowed best value both for the public sector and for the private sector to stay engaged. So, again encourage partnership solutions inoperability and work for shared value around business model, so I think I will wrap up there because we want to leave about 10, 12 minutes for questions and I just say that these reports available online along with the bunch of other work we have done around funding and financing smart city systems and look forward to hearing from you if you find the thesis for, so I think we have another question coming up here just kind of capstone for what we discussed.

Polling question #4

What issue most impacts your ability to deliver on the promise of smart cities to your constituents?

- Financing
- Partnership
- Governance
- Procurement
- All of the above

Again, I'm not going to persuade the audience here, they are talented bunch, but I was **feeling** I know which way this is headed. Rana, I blew over it to you.

Rana: Sure, Steve, and thank you and while again our participants are responding to this poll, if I may ask you or Michael a question around again based on your experiences around the globe, what are some of the differences

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or similarities between you guys communities, cities versus global in terms of approaches that they have taken?

Steve: Michael, I can jump on this. One thing that's interesting in US market around this and I think why the European markets a bit more evolved is I think the encouragement around collaboration is directly a little bit stronger and I think that's partly driven by the use of P3 as one delivery model whether the larger share of deals done using that model, so there is a greater understanding, but historically multiple vendors being involved, how you structure these deals, degree in which this risk transferring, what kind of (?) (50:46) to each side, I think we are going to see more of that in the US, Rana and I think we are starting to see it now, there is number of projects procurements underway, we were starting to see this especially things like lighting, kiosk, that sort of stuff, I think historically that's really being because the US debt markets and the credit strengths of the US cities maybe having a look at this, but given tightness of budget and other needs to bring in this new form of innovation, I mean that's one thing I think we will see more of it, Michael, I will throw it over you to because (?) (51:22).

Michael: Yeah, I think there is consistency in terms of public sector deficits need for infrastructure and plenty of private capital available in all of the markets, what you are seeing is probably Europe, it's a bit ahead in terms of the private sector involvement, although what we would say and part of our drive on the message of don't select the procurement methodology and so you design what you need is the PPP model, the public private partnerships, RPFI in the UK, there's been a lack of flexibility over the 20 and 30-year projects and that's calls challenges in different ways, so it's (?) (52:05) finance, the operations and the cost have an impact and so the challenge and that's why you have all the need for private sector participation around the world is to get a design a project and procurement structure that provides you with the required flexibility if its needed and the more you do smart cities, the more about flexibility that we need, would also allow for private finance and private sector participation. There is a lot of experience across Europe and a lot of their project developers have started working all the way around the world particularly the Spanish and Germans and UK teams, but that's also the investors now are becoming more global and getting involved in projects and the scale of the opportunities that's in the US is likely to need more of them and attract more of them, it shows as long as they design properly I think there is a lot of opportunity for US government.

Rana: Thanks Michael. Thanks Steve. I know we are in about 5 minutes left, a bunch of questions have come through; in the interest of time, let me just pick a few, so that we can get through at least a couple. One of the questions was around the entity, which is most likely to pull the others to gather and lead effective planning and execution and entity referring to what, I think I had mentioned in my presentation around government, nonprofit industry academia constituents. Michael, again directly for you, have you seen any construct that has worked quite well when it comes to creative funding, financing at sustainable level and which entity has taken up that cause or led that effort.

Michael: Well, the cities generally are owned by government or government entities, so it's generally easier for them to drive in most cases, you need to

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look at the capability and the capacity for government to do that and if there is a need for a project, yes, lacking that capability or capacity, they need to get the private sector involved sooner rather than later, but there likelihood more does interaction with the general public, the more, there is a need for different stakeholders, early engagement and fully engagement in transparency between the various parties, it likely to deliver better and more successful project.

Rana: Thank you, Michael and I think in addition to that also we are seeing in some countries at least the different government and private sector, and academia some special purpose vehicles are also being set up to maybe administer not nicely raised, but administer the funding and financing that is made available for the smart city initiatives. The second question, let me take quickly is, there is a question around the fact that it seemed that the focus is on physical infrastructure and technology, how do you see city's infrastructure for providing social services and general services related to the smart cities movement. Let me attempt brief hands and then Michael and Steve if you have anything please provide your input. So, while it's true as we have been talking about the backbone obviously is making sure that you have the foundational aspects of physical infrastructure, the technology platform, but the success is really measured on specific used cases, which focus on the beneficiaries, right and beneficiaries include constituents at the core. So, if I take a couple of examples from the USDOT challenge grands where 78 cities applied and they are all in public domain. Columbus for example focused on reducing infant mortality in three neighborhoods within the city geography by providing innovative creative mobility access to pregnant woman on medicate program within US. So, it's ultimately was about saving babies' lives and prevent with the good care. So, similarly the focus really is again on creating a social infrastructure that fits on top of the backbone layer which is your physical and technology layers. Michael, Steve anything to add to that?

Michael: Sounds good.

Rana: Okay. And then maybe just a minute left, there is a question that came around can you mention any examples of successfully implementing smart city projects in the developing world, I know Michael and Steve, you have traveled the world in this regard, any example come to mind?

Steve: Well, I mean I think wholesale, so everyone knows a lot of it occurred in the developed world especially anything around the true green filled, (?) (57:45) smart cities from the ground-ups, you can think of Masdar, Saunders city, Masdar in UAE, Saunders city in Korea, and what you tend to see in the developing markets are not kind of a wholesale programs, but you have been looking at things like we you are saying a transit-orient solution in Nairobi, are you looking at responsive city platform for example, where we have actually done some work in Buenos areas, which started really as a procurement work system, but actually it's moved over time into a tool for citizen engagement with the city through as a managed service, but it's basically through identifying potholes, other service breakdown, allowing citizens to engage, to directly report them under the gamification element around it, so, I think Rana on that one what you tend to see is not yet wholesale city transitions or large smart city programs, but kind of more of a spoke or sector level solutions or services, but I think it's likely to grow and some of our work with development

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A webinar on financing tomorrow's smart cities ecosystems

partners or development intrusions are actually getting to this point, how do you use concessional loans, grant financing to be able to C capital to help lose some of these things for de-risk in these investments where there is budget constraints in developing markets, so I have said everyone (?) (59:07) stay tuned because that's an active and important area.

Rana: Thank you Steve, and I know we are at the top of the hour. So, thank you all for participating, I trust this was a meaningful conversation for you all, as where the questions for us and also look forward to continued engagement in the future, bye for now.

This does conclude our presentation for today. Just remainder that in the "Downloads and Links" window in the upper left area of your screen, you can download a pdf for today's slides as we did experience a brief issue while advancing the slides today. We apologize for that and want to make sure you have all of this great information. When we do close in a moment, there is a short evaluation survey that we would love to get fill out, it will pop up on the screen. We appreciate your valuable feedback. This survey will also give you the opportunity to list any team members that are not registered by participating in the room with you so that they too can get CPE credit. This webinar will be available in archive in about one hour at the same link as live webinar, so feel free to comeback and review any of the content or in by colleagues. Thank you for joining us and have a great day.

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