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LATIN AMERICA'S BUS RAPID TRANSIT BOOM –
LESSONS FOR U.S. PUBLIC TRANSPORTATION

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P R O C E E D I N G S

MR. CÁRDENAS: Good morning. My name is Mauricio Cardenas. I'm a senior fellow and the director of the Latin American Initiative here at the Brookings Institution. I want to welcome you all to this event.

What we're going to do today is something relatively unusual. We usually have events here to talk about what Latin American should do or should not do, a little bit on the lecturing mode towards Latin American. Now, we're going to do that in reverse.

We're going to look at something that Latin American has done relatively well, something where Latin America can be considered as an innovator, and think of what lessons can we draw from that for the U.S. So, I think it's good for balancing the game.

And we're going to start this by looking at a report that was produced by a new initiative called EMBARQ that is led by Dario Hidalgo, who is here on my right. That's part of the WRI, World Research Institute. And that report basically looks at these new projects, which are called the BRTs, the Bus Rapid Transit systems.

As some of you may know, this was an innovation that if we're going to assign intellectual property rights, we'll probably say it's Curitiba that deserves them. But that other cities in Latin America, and now in other parts of the developing world, embraced, developed, expanded, and improved.

Nothing is perfect. And certainly these BRTs have some weak spots, and it's important that we discuss them. And I think the report does justice to the problems. So, I think that the best way to go for the next, you know, 90 minutes is that we start by listening to the report for about 15 minutes, and then we're going to have a

panel conversation. And the panel -- we have experts. I'll introduce them in a minute -- that I think can actually distill very much this experience and try to convert it into lessons for the U.S. And the panel is broad in terms of its expertise and I think it's going to be an enlightening conversation.

Let me introduce first Dario Hidalgo, who is the, as I said, the director of EMBARQ and the main person responsible for this report. Dario is a PhD in transportation planning from Ohio State University, has been advising cities and governments throughout the world, especially in the emerging world, as vast experience and in the implementation of these BRTs. And as a Colombian, also played an important role in the implementation of the system in Bogotá called Trans Millenio. He was deputy manager of TransMilenio, which is one of the most successful of all the BRTs, at least in terms of the number of passengers, if you want to measure it that way.

So why don't we do this. Why don't we start with Dario's presentation? Then I'll introduce you to the members of the panel as we move into the next segment.

So, Dario? I don't know if you're going to be using extensively the Power Point?

MR. HIDALGO: I do, because I have a lot of pictures.

MR. CÁRDENAS: So maybe we should sit here in the front and then we'll come back to the panel.

MR. HIDALGO: Thank you, sir. Well, it's really amazing to have this introduction of bringing something from Latin America that may be helpful for other environments, especially industrialized nations as the U.S.

And this presentation plays around these ideas of what made a successful BRT in Latin America, and what the things are -- some things that could be

improved. And also, some ideas that can be to spur discussion that can be brought to the U.S. context.

Now, BRT has been really growing fast recently. We have about 120 cities around the world with BRT or bus corridors. That covers a little bit more than 4,000 kilometers, almost 7,000 stations, close to 30,000 buses moving 27 million -- around 27 million passengers a day. But this was not the case 10 years ago. Actually, BRT has been growing incredibly fast just in the last decade. Out of the 120 cities, 97 completed systems just in the last 10 years. So, it has been a changing in trend, a complete change in trend. And who is leading this change in trend? Latin America, China, and other countries in South Asia as well.

So, it's mostly a thing that is happening fast in the developing world, and very specially in Latin America. In Latin America, we already have 32 cities with BRT that one quarter of the cities of the world. But, it's more important to see the participation in terms of ridership. It's almost two thirds of the riderships of BRTs around the world. So it's not just the mileage, it's not just the kilometers built, it's the number of passengers served. Almost 18 million people. That is the size of the biggest city in Latin America.

And all these things started in Brazil with the city of Curitiba. Curitiba in '72 put the first bus corridor and in '82, changed the bus corridor to what we know the high-level BRT. They took out the passengers to pay outside the bus, and board the bus through several doors. So they took the concepts that were already applied in many rail systems and they put it on a surface system in large buses to provide what is important. What is important is not if the tire is a steel tire or a rubber tire. What is important is the service that is provided to the people.

So by doing this, by creating a lane for the busses, creating a station

which you can board at the same level at -- accessing that bus through several doors and paying before you board, you increase the throughput and the capacity and increase the performance of the system. And in Curitiba, build the city around the BRT, which was very interesting.

And very recently, just a couple years back, after making five corridors over the last -- in the '80s and '90s they put together an additional line, which was like a peripheral corridor and they put the same concepts. But they don't do just the BRT. What is very interesting, they -- BRT is just a support measure for what they envision as the way they want to develop the city.

So, it's going to happen in these places. It has happened in the other places that, over time, it will densify and you will have a really high density linear corridors, as has been the case for 35 years in Curitiba, where BRT is the backbone of a very well-thought and developed continued land use and transport plan. Which has resulted in a remarkable thing for Curitiba.

Curitiba is -- it's a medium sized city, and it has the least traveled -- one of the least traveled times, with Porto Alegre, it's time is spent in travel across 15 Latin American cities. It has also very low tailpipe emissions. And, it has the lowest fatality rate among 15 cities.

So, it has worked. It has worked for Curitiba. So, why it has not happened in other places? Well, it has happened in other places. After Curitiba was done, the people from Ketu in Ecuador looked at Curitiba very carefully and implemented a bus corridor using many of the features of the Curitiba system, but with electric trolley busses. And they have been expanding the system, not necessarily with trolley buses. With other corridors now. They have 37 kilometers around the city.

Then came Bogotá, which used the experience of Curitiba but on steroids. Because the needs of the city were much larger than the needs of Curitiba, and as you see, has not one lane for busses, has two lanes. Very long stations, large buses. But they -- some of the other same concepts, which allowed Bogotá to have the highest throughput among BRT systems in the world with 45,000 passengers per hour per direction. Which is very rare, even for rail corridors. Even for rail corridors, it's a very high throughput.

But Bogotá, not just -- has not just this lane that you saw now in Caracas, has also this transit mall in the middle of the city, which really reinvigorated the historic downtown. And has also BRT on expressway, as you see -- well, all these cars are stuck in traffic on the expressway while the people in the busses really goes at close to 32 kilometers an hour, commercial speed.

So, Bogotá kind of adopted the experience of Curitiba to the conditions of a built -- already built city with a lot of transit needs. And the result is also very, very interesting. Bogotá is one of the few cities in the world that has been able to keep -- to reduce the use of cars in terms of modal share. Increase the use of non-motorized transport, like biking and walking. And, keep the level of usage of transit almost the same. This comes from an annual survey that is done independently in the city of Bogotá, which shows really something that is not common in developing cities, that is the fact that cars are not the increase mode of choice.

And then, some interesting results. Reduction in fatalities, one half. Which is amazing for a city the size of Bogotá. And in the corridor itself, reduction in fatalities of 56 percent. So, it's not just a matter of providing better transit, it's to get those things that the people take care about -- emissions, accidents, and then, of course,

reduce congestion.

These two experiences, Bogotá, then a little bit Ketu and then Curitiba, of course -- then took like wildfire in the region. And you now see all the cities, like either with systems already in place, or planning. So, it's kind of mainstream now. It's not on the edge of what you do.

You have Sao Paolo in Brazil, which upgraded the whole transit system and improved the quality of their bus ways and then other roads around the city. And it's the largest system of bus ways in Latin America. A small city in Mexico pioneered BRT, is the city of Leon, Guanajuato. And just last year expanded and is not just the BRT's integrated system beyond the BRT.

The Mexico City experience, which EMBARQ is very close and associated with. We have been working very close with the city since 2002 in the planning, implementation, and improvement. And it's growing really, really fast. Just this month, Mexico opened a new line, the third line, out of the system and is building two additional lines. So it's growing really, really fast providing an additional opportunity for Mexicans to move around.

And they took one of the most remarkable corridors in Insurgentes and took the lanes in the median, build the stations, put the busses, and the whole system's approach that makes BRT a success in this corridor

A lovely city in Colombia -- my wife was born there -- Pereira. It's a remarkable place. It's a small city, so putting BRT was also a challenge because the roads were very narrow. And they did it very well. They just say the roads are for the users of the busses, not for cars. Completely in very narrow right of way.

So sometimes I show the pictures of Bogotá, I say, oh you need those

very wide roads of Bogotá to do BRTs. So I need to bring the pictures of Pereira as well, because Pereira has done it on a very, very small right of way in downtown. Of course, outside of downtown are wider roads. Same thing in Guayaquil.

And then the big project of reorganizing the whole transit system in the city of Santiago, which was not very good at the beginning of the operation. Right now it's working well. It's the largest integrated system in the region. But it has some corridors that may not be full BRT but have the priority for buses and some -- a couple of corridors are totally segregated.

Guatemala did it on a shoe string. A nice story about Guatemala is that they didn't use international consultants at all. It was all inside work. And they came out with a very decent operation, and it's working really nicely for this city.

Cali, Colombia, which is not just BRT, is expanded beyond BRT and has other operation in the cities. An integrated system for the city of Cali. And Guadalajara in Mexico, a nice corridor, 16 kilometers long. We were also associated with it. It was a really, really interesting implementation there. And, as you see, it was high quality. It's not just a bus on the street, it's a really well done concept for a city that already had rail, but expanded the transit system and is integrated the rail with these BRT line.

We have Barranquilla, Colombia. I'd rather be there today, because it's Carnival. But I'm here. Mauricio, thanks. But, it's a wonderful system. It's small in scale for the conditions of Barranquilla, and also happening in Bucaramanga and in Mexico -- beyond Mexico City in the north in the expanded metropolitan area of Mexico. And, one of the last large cities of implementing it is the city of Lima, which used a fleet of natural gas, which was also an innovation.

So as you see, many examples, different adaptation according to the

different conditions. But a common thread: it's part of the way the cities are doing transit.

We did this review, and it's the report that some of you have in hand. The purpose of the review was mainly learning from these experiences across the region. And you have one of the hard copies, but it's also online. And some of the things we gathered for the report are kind of important performance indicators.

For instance, the through-put. And as you see, it's wide by our (inaudible) -- but it's very high. And what you see here for a whole -- an hour is what some systems in the U.S. context are for a day. But, it's very interesting to see that you can achieve really, really high capacity with buses, which is usually not accepted for most transit professionals. But it is a fact.

If you put all the features and you do the operations plan around providing high capacity, you are able to get that high capacity. And you are also able to get really good operational speeds, commercial speeds. Bogotá at 28 kilometers is not on this list, but Istanbul is doing 40 kilometers an hour commercial speed, which is really, really remarkable. On express way, in the case of Istanbul.

But you see most of these cities at around 20 kilometers an hour, which is really, really good for transit at a very low cost. And this is what makes BRT really, really attractive. It's low cost, low capital cost in developing countries condition. It's also very low operational cost, which makes the systems really, really attractive.

They didn't come free of problems. There were several problems in the implementation. Most of these systems were rushed because of the political cycles. They needed to get them in place on time for the next election. So, they were rushed. But -- and they had several problems at the beginning because of being rushed. But one

thing that happened is that the flexibility of the buses allow for the systems to adapt and improve. And most of the cities solve some of the teething problems easy during the first year, months. It was not a big issue. It was not nice at the beginning, but it improved.

Very tight financial planning, user fares are very low. So, the solution for Latin America has been to really do high occupancy rates. Which at the end is not that nice because if you have high occupancy rate, the people is not that happy. But, it was a result of the financial needs.

Most all these systems -- all these systems, with the exception of Santiago, are fully paid with the user fare. The vehicles and the operation. Not the infrastructure. The infrastructure is public. But, the vehicles and the operation fully paid with the user fare, which is in the average of .50 cents of a dollar. So, it's very, very, very interesting. But at the same time, will the high occupancy level bring some problems with performance there.

There were always issues with the technological competence. How to implement the fare collection system and the control systems. These are not off-the-shelf technologies yet. They are improving. And, insufficient user education. You are changing the people's lives, so when you don't really let the people know how things are changing, some problems come.

One very interesting development, really, really interesting on my colleague Lucho Gutiérrez is behind these development is, that given the problems that different agencies are facing, they form association. Like, a peer to peer collaboration. Right now there are 14 agencies around the region, and it's growing. They will have a meeting in Guayaquil in April, and it will grow accordingly. Of integrated bus systems and BRT to learn from each other. So, it's a really, really remarkable development of 2010,

and the activities are to do benchmarking, quality certification, and standardization, do some advocacy, improve the image of BRT and bus, rapid transits -- you know, better rapid transit. And it's working right now to do these in the region we are supporting this initiative.

And I close with just some food for thought. I've done really, really fast presentation of what is going on there, but I hope I was able to share a little bit of what is the good things about BRT and some of the problems. And for the U.S., you can see in these experiences in Latin America, first it's good performance. Transit -- really good quality transit for the people in these cities that provides high capacity at a very, very low cost.

So, for us it was not a choice. You don't have money, you need to provide services, you do what is on your opportunity of doing things. So -- and we did it. And now you see all these cities, 16 cities in the region. And other cities following the example.

Just in Colombia we will have Medellín and Cartagena, and Cucuta coming after. And then you have Aparequipe in Peru. You have Buenos Aires, Argentina, Asuncion in Paraguay. You have a growing mass of systems because, well, we find a way of improving transit in our cities.

Rapid implementation. That's lovely for politicians. It's really important. It's really important. You don't wait 10 years to get a project done. You just take two, three years. It's easier with the political and decision making processes in these cities, but it's very, very important and high positive impact.

So, now BRT is a feature and an aspiration of most Latin American cities. And it should be for the U.S. Thanks. (Applause)

MR. CÁRDENAS: Alright. Thank you, Dario. I'm going to invite the members of the panel to take their seats. And if we could just use the screens on the side, if -- for those of you that have presentations.

While you get a mic, let me introduce the members of the panel. First we have Marc Elrich, who is a member of the Montgomery County Council in Maryland, for those of you that do not know where Montgomery County is. He has been promoting this idea in Montgomery County. I think it will be interesting to -- for us to hear from him what kind of response he's got from the community.

I have to say that as a resident of Montgomery County and as a very happy parent of Montgomery County school system; I think Montgomery County does a great job in terms of education. And it is just remarkable. So it will be also quite interesting to see if Montgomery County is at the forefront of this transformation here in the U.S.

The second panelist is Sam Zimmerman. Sam is a former director of planning at the FTA, the Federal Transit Administration. And in that capacity has been quite involved in the development of the bus rapid transit system here in the U.S. As you know, the Department of Transportation has issued some implementation guidelines and after that experience with DoT, Sam has been advising governments and consulting, mostly through the World Bank. So, more than 40 years of experience in transportation planning.

And last but not least, Robert Puentes, who is a colleague here at Brookings. Robert is the director of the Metropolitan Infrastructure Initiative. And is also a Senior Fellow. He has done extensive work in promoting transportation infrastructure at the metropolitan level here in the U.S. and an extensive list of publications. I

commend you to read by looking at the Brookings website; especially the Metropolitan program has done tremendous work in terms of highlighting the importance of urban development for this country.

So, why don't we start with Marc? And then, we'll go to Sam, and we'll close with Robert.

The idea is -- and given that we have a relatively small group, to engage in a conversation. I think that's the most important aspect of these panels. So I really encourage you to think about your comments and your questions so that we -- we're going to give each one of the panelists about 10 minutes. So we're going to leave about 30 minutes for a conversation.

So, thank you for coming, and the floor is yours.

MR. ELRICH: Could I use the podium? It would be a lot easier for me to talk off there if I could.

MR. CÁRDENAS: Absolutely. Just don't take more than 10 minutes.

MR. ELRICH: That's probably why.

Hi, I'm not known for sound bites. So, I try to write some things down occasionally when I know there are time constraints.

So the two questions I was going to try to address in the context of this forum were, why BRT in a suburb? Montgomery County is definitely a suburb. And, what obstacles are we overcoming? What obstacles would I come up against, and how do we manage to move past them?

And for those of you who don't know much about Montgomery County, I'll tell you that it's -- we're no longer the suburban bedroom community for the District of Columbia, which was sort of the origins of the city. We're about a million people now,

and we have very, very high density nodes of development.

We have what might be considered mini-cities along the Metro, where we have lots and lots of jobs and where we're planning to put lots and lots of jobs. In 85 percent of our growth over the next -- how many years? Thirty years is projected to be up in the -- is one quarter of Montgomery County.

Are the slides on? Ah, okay, I don't see it right now. Escape? I don't know -- I'll do without slides.

So, this is the system if you can tell out there of what I've laid out for Montgomery County. It's 120 miles of bus rapid transit. And it's pretty aggressive. It's a combination of north-south corridors and east-west corridors. And if you look on that, the heavy lines up the left hand side is western Montgomery County. That's where we're planning almost all the housing and job growth in the county over the next 30 years.

Much of our population lives right of that line, or east of that line. And we have an enormous problem in Montgomery County with traffic. We have terrible north-south flows in the morning, and east-west in the morning and then in the evening it reverses. It's terrible going back east and it's terrible going north. And so it's sort of this situation that -- usually pretty good with tech. Okay.

So, we've got some real problems. We have, I think, the fourth worst congestion -- as I was riding in this morning, I was reading the paper. And we now rank with cities in congestion. We are up there with Los Angeles, New York, and Chicago. So, we're a county and we're like ranked with the worst cities in the United States for congestion.

And when I got elected, you know, I ran on a platform of no growth without infrastructure. So, the developers hated me because I wasn't going to approve

projects unless the infrastructure was put in place. And I wanted real tests for traffic tests because we have bogus traffic tests in Montgomery County. We concocted our own tests, which basically let everything pass which led to this amazing amount of congestion with no infrastructures. We were just declaring, you didn't have to build anything, everything was fine.

And what I found was that if I used the kind of real world tests that everybody else was using around the country, instead of being able to solve Montgomery County's problems, you'd actually grind Montgomery County to a total halt. There was no way to build our way out of this problem. You couldn't build the roads or the infrastructure in a traditional sense the way we tackle things in the county and be able to continue to grow. And I started looking around, and I said, well, what are the people doing in the world? Surely we're not the only congested place in the universe. Other people are trying to deal with this.

And I went, like many people did, on Google and I started googling. And this gets to, you know, the obstacles you overcome. I'm typical of the obstacle that you have to overcome. Because what I googled was "rail". I didn't google bus rapid transit. And one of the things about Montgomery County because of these traffic flows, I realized that you could run -- what you really need is a system that ran north-south in the morning and east-west in the morning and that reversed the other way. I said, great. I don't need to build two tracks. So what did I look for when I was googling? Bi-modal rail vehicles. I looked for rail vehicles that could run on a track, you know, in the peak direction and then drive back on the road in the non-peak direction. That's how biased I was toward a rail solution to this problem.

And I finally found one in Yokida, Japan. And it only held 25 passengers.

And I said: this is not going to work. (Laughter)

And so, in the process of doing that I had looked at, you know -- I kept seeing these references to BRT, BRT, BRT. I served on a county transportation task force in 2001. My friend Rodolpho -- I think Rodolpho Perez was on that. He kept saying, Curitiba, Curitiba, Curitiba. And I kept kind of like thinking that's nice, that's nice, that's nice. But this is all about rail.

And so I just couldn't get my head around it. Then, when I kind of realized that you read the numbers -- like you showed on the screen -- that you actually can handle the kind of volumes of people that we're talking about in Montgomery County, I'm not needing in my lines to move the volumes of Bogotá in any one line. We could actually -- BRT was adequate to meet the demands on the lines.

The cost effectiveness was really outstanding. It just didn't cost what everything else cost, and Montgomery County doesn't have money. We don't mint it. We're really struggling for infrastructure. The state of Maryland is struggling for infrastructure. And so I kind of arrived at, okay. I need to look at the BRT system.

And I guess, you know, one day three years ago I sent my aid a list of origin destination pairs. I said, this is where people live in Montgomery County, this is where they work. Map me out the routes on a map and tell me how to get people from where they live to where they work. And out of that we developed basically this system there, which is -- you know, this 120 miles of connecting residential communities to job centers.

On the left hand side again, we kind of think about as jobs conveyor belt. Once we get you over to the lines on the left side of the county or the west side of the county, we can move you up and down to all the jobs in the universe. And if that's the

way we're going to develop, that's what you need to do.

And I thought, okay. This is kind of logical. And at the same time we were dealing with, you know, environmental questions. And I was at a Council of Governments' presentation and somebody said, well, we looked at these horrible projections for CO2 in the future for this region. And I turned to my colleague on the council, who is also a colleague, and I said, people are going to have to ride transit. And he said: everybody's not going to ride the bus. And I thought for a minute. I said, wait a minute. I don't know how many people need to ride the bus. I mean, it's certainly not everybody. And if everybody is the answer, that's not going to happen so we might as well all give up and go home. But it's something less than everybody and more than zero.

And so I asked the Council of Governments to actually disaggregate Montgomery County and tell me how many people do I have to get off the road and how many vehicle miles do I have to reduce in order to knock down CO2. And they came back and said, if you knock down your 2030 vehicle miles traveled by 8.3 percent, you're back to 2002 levels of CO2. If you can get 15 to 20 percent, you're back around 1990 levels of CO2. I said, well, this isn't everybody. This might actually be doable. Can we have a conversation about this? And, you know, again I hadn't thought about it until somebody kind of, you know, put the question that way.

And I guess those two things made me think that, you know, we could actually look at BRT. And it would actually have a chance of taking people off the road and add environmental benefits. And the other part of this I've tried to sell to the development community, which is with some success, is actually to marry parking caps to any transportation plan. Because everybody's fear is if you make the roads better,

everybody will then drive because you have now fixed the road problem. And I don't want people to drive. So I thought if we could impose parking caps in the metro centers, we can actually start from an end state. Say, how many people do you want to drive? What's your pollution goal you want to reach? What are you trying to achieve? And then allocate parking spaces, so no more people can come into that.

And the benefit of that approach is you then drive your transit numbers. Instead of trying to incentivize people on the transit, if you limit parking you actually create your transit riders because they don't have any other way to get there but by transit. And surprisingly, the development community -- or maybe not surprisingly -- they were like, well, we could live with this if you put the transit in place first.

And so pieces started coming together. And I said, okay. This is actually a way forward here. In the end, how you got over this is sort of -- is interesting. I had a meeting with the Chamber of Commerce, Land Use, and Transportation Committee. People who know me know that these are not my allies. And I did my whole presentation on BRT, and they were kind of grumbling. And one of the guys gets up and says, what are our choices? And I said: here are your choices. I said, Montgomery County -- you're not building any more roads. And everybody agreed, no more roads are going into the Bethesda, Silver Spring, Rockfield -- we're done road building. And all the developers said, yeah, we're done road building.

I said, okay. So, you like the system I proposed. Are you going to do it as a subway system with \$300 million a mile? How many miles do you think you're going to build? And everybody just shakes their head. And I said, okay. You're going to do it as a light rail system. The purple line is going to cost you \$100 million a mile, the CCT is going to do \$75 million a mile. Do you think you're going to build that? And everybody

said, no, I'm not going to do that.

I said: you're going to build bus ways like they did in Pittsburg? The bus ways are separate roadways where they took abandoned railroad tracks and built whole bus roads. I said: if I don't have room for car roads I don't have room for bus roads. And everybody said, "Yeah, we're not going to do that."

Rapid bus, which is -- passes for BRT in some places, which is basically queue jumpers and light extenders, doesn't work in heavily congested areas, which we are. And I said, well that's not going to work here. And they said, yeah.

And I said, well, how about rail-like vehicles? Bus rapid transit? You know, the thing on -- the system I'm proposing. That is something we could actually do. We own the median strips; I don't have to pay anybody for the median strips. I can take advantage of directionality and build a single track road that's all I have room for, and if I run buses back on the road in non-peak, uncongested conditions I can get away with building half the capital infrastructure instead of two tracks everywhere, so it becomes less expensive. It can be done relatively quickly. The construction process for BRT is fascinatingly simple. Dig down 18 inches, lay down your base of gravel, put on some filter paper, put on the rebar, and use a slip forming machine to pave your guide ways on top of it.

I'm oversimplifying it, of course. But it's actually -- it's a lot simpler than a lot of other things we do in Montgomery County or anyplace else. And, what I found was that that kind of turned the audience. And I've used that approach with everybody since then. It's sort of like, you don't have to love buses. But, what else are you going to do? I said: if you're really committed to solving the problem -- if you really want to move people and you really want to knock down CO2 and you really want to allow for future economic

development as opposed to causing -- bringing a halt to everything, you've got to move people.

If you can't afford the subways, and you can't afford the trains, you only have one other place to go. And then the thing is to build the state of the art BRT system that in every way possible mimics what you can do, the performance of light rail systems -- if you invest and if you do it the right way. And you can put something in place that's feasible, quick, and cost effective. And cost effective has resonance today. Quick has resonance today for all the political reasons that you mentioned. But also, because people are really frustrated and they want to see a solution.

And I've done these presentations -- usually I take about an hour. And I do these to all the civic groups in Montgomery County; I've done all the chambers. And I have yet to run into a hostile audience. And you're told that people hate buses, right? I have yet to be told, we're not riding this system, we're only riding this if this is trains. What people tell you is, I want the buses to look like this, they have to run like this. I want linear routes, and all the stuff you know if you're into bus rapid transit. And if you do that, we will ride it. Because we need an alternative, we're tired of being stuck in traffic.

And so I've worked a lot with the business community to get them comfortable. And I will say that my first encounter at Brookings a year ago when I mentioned BRT, you know, the Brookings people were like, are you out of your mind? No one will invest around BRT. (Laughter) And I got to say, that's sort of the litany of what you get.

The other rap on BRT, other than people hate buses, is that, you know, all the thinkers will tell you that no businesses will invest around BRT --

One of the speakers: Except where there is BRT --

MR. ELRICH: Except where there is -- well, yeah. And so, I was like, well, you know -- I got these developers and White Flint who are more than happy to invest around BRT. And there aren't many examples of BRT in the United States, so it's easy to conclude that no one will invest around something that doesn't exist. But I think, you know, the climate is changing. And I think people are a lot more open.

So, anyway, I've tried to push this by getting people to say, if you really want to do something, what are your choices? And I think if we confront people with that question and say, what do you really want to do? And, how are you going to do it? You wind up here. You don't have to love it to get here, you just have to be reasonable and open-minded, or at least get your mind opened at some point, and ask yourself honestly, can I solve this problem or not. And I think if you're going to solve the problem, this is the best way to do it.

Thank you. (Applause)

MR. CÁRDENAS: Great. Well, thank you. Thank you, Marc. So, it's cost, cost, cost. One of the issues that is in the report, it's a comparison of the cost of a metro with the BRTs. And it's a 1 to 1,000 comparison. So, it's an amazingly effective and efficient way of moving people.

Next, Sam Zimmerman?

MR. ZIMMERMAN: Well, I sort of prepared some formal remarks but I'll skip over that.

My background, as noted, was -- included 28 years at the U.S. DoT. For the last 10 years or so, I worked at AECOM, but I've been the advisor for urban transport for the World Bank for a long time. So I've sort of been looking inward, and I think it's given me a good opportunity rather than being immersed in things like I was at the U.S.

DoT to make some critical observations about what's happening here in the U.S.

I'd like to talk about four sets of impediments to BRT in the U.S. Obvious ones, maybe some subtle ones, some technical ones, and some maybe U.S. government-related ones.

First, the obvious ones. People have been building monuments to themselves -- last time I checked, for around 5,000 years. I mean, the pyramids are an example of something that was totally dysfunctional but people liked, right? We have that as a syndrome that we work in. That same syndrome leads to stadiums, convention centers. We have something that was referred to as John Cain as the Lionel Complex. Nobody's playing with buses around Christmastime. They're not running around the tree, so to speak. So, we're working in that psychological milieu.

People are frustrated, and a lack of information, which I'll talk about a little bit under the sort of subtle issues, leads people that are frustrated to look for obvious but maybe not correct solutions. Very important in the U.S. -- and, frankly, everywhere in the world based on who gets disbarred from the World Bank, the ADB, and various places for bribery -- is the very aggressive lobbies for rail transit. At the same time, there are aggressive, if anything, lobbies against BRT and buses. So it's not just pushing a rail agenda, but also lobbying against anything to do with buses.

First, obvious one. The auto industry, highway construction, anything associated with driving. They don't want transit, period. They don't care what the wheels are made out of. Number one. Rail car manufacturers and engineering companies. There is big money to be made in rail systems. Big money, either by selling systems -- that is, selling the equipment. Or, by engineering them.

I was recently reading a report by Federal Transit on soft costs in rail

construction. And in some cases, the soft cost -- read, engineering. Read, insurance and the like -- 30 percent of the total cost. Now, I'm an engineering company, and I work for one. It's called AECOM, which -- the highest ethics. But, look at the subtle pressures you have. No matter how ethical you are, when you can make 30 percent of a billion dollars, or 15 percent of a hundred million. Now, the most ethical, competent people in the world are going to feel that pressure. Let's put it that way.

Another negative lobby that people never think about are the bus people. How could bus people be against BRT? I've worked all over the United States, Canada, and the traditional bus operations people always say, what's the big deal about BRT? In my city -- New York, Chicago I've heard this, LA, whatever -- people take transit. They don't care about any fantasy things, just give them a better bus service, more frequent service, maybe expand the shelter a little bit. So, they are opponents to doing anything beyond regular bus service, sort of making the case for the rail people that say, this is just another bus.

There are a lot of well meaning, I think, but uninformed urban livability environmental activists who repeat the whole series of canards about anything associated with buses. For an example, everybody knows that buses are very bad for pollution, right? I heard that at a presentation. I was doing a workshop in China by a consultant firm from the UK looking at the different modes, talking about how horribly polluting buses were.

As he was speaking about the wonders of a light rail project that his firm was promoting, I was looking out the window four blocks away. There was a coal 500 megawatt, I believe it was, coal-fired electric generation plant in downtown -- it was Arumtchee which is up in Shijiazhuang way in the north. I'm looking at that plant like

this out the window, one kilometer away, and this guy's talking about how non-polluting rail transit is as if it all comes from windmills and the like.

Another maybe not so obvious, I would term it obvious, the upwardly mobile politicians and transit officials. If you're a transit general manager the best thing you can do on your CV is to have a rail system or a rail line extension under your belt -- look what I have done -- if you want to go to the next level up. A politician, right -- you know, the World Bank is a classic place to look at this. How many mayors who want to be president are running on the basis of promoting a metro? I mean, but who's doing the same thing with BRT?

Marc Elrich, I hope he runs for something above Montgomery County. I told him I would -- what about the more subtle impediments that people wouldn't know about -- and by the way, a big lobby that's probably neutral but certainly very aggressively pro-rail, is the media. I've been reading the Washington Post for 40 years, I've lived here, and I've never seen them promote anything other than rail transit really. They may occasionally say something about BRT, but, you know, the sort of the -- and why, I don't know. Maybe they don't know about it. Nobody has talked to them about it, perhaps. I'm not really sure. Maybe it's because their commercial interest, they're focused on the downtowns of central cities, they can't -- they don't see that this might be more appropriate for suburbs. I'm not sure.

Okay, more subtle impediments, I think there's a lot of mythology out there and we've heard a little bit about that today. Service quality. There's something about the laws of physics that apply differently to buses than for trains. They have to be slow. They have to be unreliable. It doesn't matter whether they're electric hybrids or not, they have to be polluting. They may, even though there are models available

everywhere in the world that have lower sound emissions than a car, they are invariably noisy. And, of course, they're uncomfortable. I've heard some of the streetcar proponents talking about ride comfort of streetcars as being the reason that we need to have them as opposed to those terrible buses which are so uncomfortable.

And I'm thinking, well, if ride comfort was the big thing, wouldn't people in cars want to switch over to rail transit, automatically, 100 percent, because they're so much more comfortable? Well, obviously not.

Capacity. A general manager -- I'll tell you, we were in Austin, Texas, 25 years ago -- told me, that they couldn't possibly do a BRT project, they had to go light rail, because everybody knows that buses just don't have the capacity. The busiest bus route in the system at that time was 10,000 a day. They've since opened a commuter rail line, I think it has 1,000 daily passengers, but BRT didn't have the capacity.

Operating costs. CISTRA -- I don't want to talk about specific companies, but anyway --

DARIO (one of the speakers): You did.

MR. ZIMMERMAN: I did. Yeah, but anyway, even one of the big rail promoting consulting firms has conceded in an analysis that they did for the French government, that there's a tipping point beyond which rail has lower operating and maintenance costs, and they differentiated --

DARIO: Ninety-thousand?

MR. ZIMMERMAN: Well, they differentiate -- no, they differentiate between developed countries, where they have high labor costs, and underdeveloped and un -- or developing countries, where their costs are lower. For developed countries with European and North American style labor unit operating costs, the tipping point is

around 15,000 an hour. It's an hourly thing. Why? Because the savings with rail -- and there are real savings with having a huge service unit -- occur when the additional costs of the maintenance of the track, the operating systems, the more complex vehicles and all of the above, are offset by the savings in drivers. But if you don't have enough ridership to have savings in drivers, then you're stuck with all the fixed cost of the operation.

So, in the American context, I doubt very highly whether any of the new light rail systems would not have -- you wouldn't have lower operating costs.

Now, you can't compare the operating costs per trip or any basis for the entire bus system to one rail line. It's like comparing the profitability of gum next to the supermarket cash register the overall profitability of the store. You have to take a look at, you know, like things, line-to-line, et cetera, on that.

And of course appeal to people with a travel choice. The mythology is never. And yet if you look at a BRT system, whether it's Cleveland, whether it's LA, the cross-section of the people using those BRT systems is the same, is the cross-section using rail, and it's different from a regular local bus system because they have a different set of attributes and they're in different locations.

Appeal to developers. If you go to York, Ontario where I worked on a BRT system, if you go to Pittsburgh, if you go to Cleveland to talk to developers, and now Mark, you'll find out that BRT can have development effects and properly planned, they can be pretty much along the lines of what you'd expect with rail. And properly planned and executed means the kind of public policies that you'd get when you build a rail system -- up-zoning, in the case of Portland they got basically free land and \$350 million worth of tax abatements for the streetcar system there, et cetera. Do the same thing for

a high-end, high quality BRT system and the development effects will be very, very similar.

And then there is something -- I hate to have to say it in front of this audience, but maybe -- I don't think I'll be castigated -- I think there's a little racism in the anti-bus business, and whether -- if it's not racism, it's economic discrimination and history. In the times when the bus systems were horrible, and they were horrible, let's say late '50s through the '60s, '70s, the people that couldn't afford choices rode buses, right? So, the theory was that people that have choices -- you have to provide something different. I remember a mayor of a big city in the south which had a peak pull out -- it's a bus term, or a transit term -- 60 buses for a million and a half people, talking about how they needed a rail system, so -- or a rail line at that time -- and I said, well, do you think you ought to start by having a complete coverage bus system so every resident of your city had access to public transport and then go from there? And the woman who later became a Congressman said, "Mr. Zimmerman, you know what kind of people ride buses, don't you?" I said, "No, fill me in," because I was a bus rider.

I knew what she was talking about. She didn't have to tell me. But anyway, I think that's at work there. It really is.

Then there's some maybe not so subtle technical issues. I think there's still uncertainty among the professional community what BRT is. Maybe that's a problem with its flexibility. Any crap on the ground where you paint the bus a different color, I've heard that called BRT. The key is, it's an integrated system. If you refer to BRT as a service, you're starting off on the wrong foot. Obviously it has to have dedicated rights of way. The laws of physics that apply to trains on their own right of way apply to buses. If you don't have to mess with traffic you can be fast and reliable. And then of course the

importance of consistent branding.

There's also a misunderstanding. Having worked for the World Bank, again, for about seven or eight years where a lot of my job is helping people plan things, when I see proposals, terms of reference, for BRT, almost all the engineering companies come in as if it's an engineering job for a highway, right? They lead with, this is what the pavement will be, or this is what the vehicles will look like, without understanding that the key step is figuring out what the market is. What's the problem you're trying to solve? And what's the appropriate service? The technology follows, it doesn't begin, and yet they begin with the technology.

I think there's a lot of a lack of factual information, like on development effects. If you walk or drive around or take the bus around Bogota, every station is surrounded by the same kind of mixed use, high intensity development you see around Ballston, Ballston-Rosslyn corridor, Bethesda, et cetera. Cleveland, of course, has done a marvelous job of upgrading the Euclid corridor, but who knows about it? Does the press know about that? Do the planners know about it?

There's also an issue of deconstruction. The deconstruction means, if you have a BRT plan and people are nervous about the cost they'll say: do you really need dedicated vehicles? It's okay to run a two-door articulated bus with a floor 90 inches off the ground. It's okay. You've got them. We don't have to spend the money on new buses. Do you really need a dedicated right of way? Run it in mixed traffic. We don't want to piss anybody off. Do you really need an architect-designed station? This is a bus. We'll get it delivered off the back of a flat bed truck from some advertising manufacturer and so on.

Now, at the end of the day will it work as just another bus route? Sure.

Will it be BRT? No.

Now, imagine on the rail side if somebody was proposing a light rail line and said, do you really need the track? Or do you really need LRT vehicles? Why don't we just build an LRT system and run old buses on it? You never hear that, but you can deconstruct.

One last thing is there's some DOT issues coming up and one of the lights in America was this alternatives analysis process, which forced people to look at options. Another light in America was a multi-factored evaluation process in which cost effectiveness was very broadly defined. They are both in the midst of being gutted right now. The alternatives analysis process as (inaudible) step in project development, I believe is about to be eliminated. The evaluation process is also going to be, let's say, putting up into a lot of hand waving criteria, et cetera, and the proponents of that deconstruction of this very good government through different administrations, different parties, that was actually taught as a case study at the Harvard-Kennedy School as a representation of good government, it's about to disappear. The lobby that is about to disappear it, frankly, were the lobbies I was talking about before. The good government lobby, if you will -- by the way, I'm speaking as a transit advocate here, not as a BRT advocate. I don't give a darn what it is, what the wheels are made out of, I like taking public transportation. But the point is, that process, which in a way forced people -- unfortunately had to force people, because of everything else I spoke about, is about to disappear.

So, end of story.

MR. CÁRDENAS: Thank you.

(Applause)

MR. CÁRDENAS: Robert?

MR. PUENTES: Thank you very much. Thanks for having me here and thanks for pulling this together. I think that clearly we've learned that there's a lot that the U.S. can learn on the international context, particularly as it comes to this issue. We are - - as we know, we are almost nowhere on this compared to what we see going on particularly in South America. I thought the presentations, the slides, were very illustrative and I think very helpful for our conversation going forward.

So, I mean, a lot has been covered already. A lot of the things that I was going to talk about kind of made mincemeat of my notes here, so let me just kind of back up for a second and talk -- and provide, I guess, some context for this discussion today and then some challenges and opportunities, I think, going forward.

I thought the slide that showed the rapid increase in these BRT systems over the last decade was very illustrative and illuminating. I think that that's not that surprising though when you think about it. We are an urbanizing world. We know that more people are living in cities than not in cities for the first time ever. So, globally this urbanization phenomenon should result in projects like this. I think that's certainly a good thing, particularly in China, particularly in South America where so much of this growth is going on.

For the U.S., I think it's important to understand that we are also a growing nation. This isn't Western Europe, you know, this isn't Japan or places that are actually being depopulated. They use these terms in places like that. We're growing. You see it in Montgomery County; you see it all across this country. But you particularly see it in some places like the inter mountain west, so we know we're going to accommodate 100 million more people over the next however many decades it is. We

know those stats. But we know that a lot of that growth is going to be happening in the inter mountain west I places like Phoenix and Denver and Las Vegas, Salt Lake City. These places are planning for this kind of rapid urbanization. All this growth, we think is going to be happening within these metropolitan areas, within urbanized places, where transit service -- not just BRT, but all kinds of transit service and all kinds of transportation service, is going to be needed.

So, we've got to get ahead of this and start planning for these things for the future. I think planning for new growth in new places is exponentially easier than planning for growth in existing places or trying to put these things in existing places, and you can certainly tell us about those kinds of challenges. It's really hard to do.

So, there's a lot going on in this country, I think, that's helpful for this conversation. The problem that we have is that the -- are these larger fiscal challenges, particularly when it comes to transportation, not just on the federal level but also within many of the states. We know that the source for funding a lot of these transportation programs -- the gasoline tax -- is a declining, unsustainable revenue source. We haven't raised the gas tax in 20 something years. Most states haven't raised it in 20 years. People are driving less; they're driving much more fuel-efficient vehicles, (inaudible) less revenue. It's not a cycle that's very good for having more money to spend on lots of different transit and transportation projects across the board.

We do, though, see a lot of metropolitan areas going to their voters looking for different ways to fund transportation projects, so while we're stalled here on the federal level, doing some interesting things but generally stalled on the federal level while states are all in kind of cut, cut, cut mode, particularly this year, we see metropolitan areas going to their voters, asking them to approve referenda for raising

money for transportation projects. They did it in LA right in the middle of the recession. A lot of those inter mountain west places I talked about are also doing this.

So, the financing for these things is changing. I'm going to get to that in just a second. I think all of that actually is very helpful for the conversation around bus rapid transit, because as we kind of hinted to, a lot more scrutiny is being placed on a lot of these projects, a lot of how the government is spending money, particularly how they're spending it for transit and transportation.

So, as policy wonks we talk a lot about things like benefit-cost analyses. We think clearly these are going to be part and parcel about how we choose projects in the future, again, with much more scrutiny in terms of the voters and much more scrutiny in terms of these analyses that we're using to determine what kind of projects are going to give us more bang for the buck given the economic challenges that we're facing today.

The problem with that as I think we're kind of hinting to, you can start measuring the wrong things and wind up with projects that you don't really want. If you're measuring just throughput on a certain corridor, that might lead you to a highway investment that you may not want. If you're just trying to measure real estate development potential, that might lead to you to a heavy rail investment that might be too expensive.

So, we've got to make sure that we're starting to measure the right things, but we're starting to do that and I think that's certainly a good thing and I think at the end of the day that will help BRT overall.

But just some challenges, really, that just kind of came to me while we were listening to the conversation today, the first thing -- I guess Sam kind of hinted to this -- we can't be religious about these different modes. It's just not that, I think, helpful

at the end of the day. We can't have bus guys and transit people and highway guys. I mean, I know that the lobbies are set up that way and we certainly have factions of folks that are -- you know, that are attracted to certain modes for one reason or another, but as long as we're thinking about it as these different modes, I think we're going to have problems overall. They're shutting down bike lanes in New York. They're rejecting highway -- all these things are not that helpful, I think, to the larger conversation of solving metropolitan transportation challenges. Clearly we have to deal with problems within jurisdictions like Montgomery County, but the labor pool for Montgomery County is not just the county, it's an entire metropolitan area. It spans these county borders. We've got to think about these things more as an integrated system as opposed to what particular mode is best overall. All these things really matter very particularly when you start mapping it out as part of a larger metropolitan plan.

So, we've got to be -- we've got to avoid these modal battles. I think at the end of the day they're not -- they're just not that helpful.

And then trying to get past this other -- this larger issue around the development process, I totally agree with what Sam said that it's not just that the development community won't redevelop around a bus rapid transit station, they won't redevelop around something that they don't think is going to be there permanently, which is why you've got to make sure that the BRT stations are permanent, and you've got to have the requisite land use that's going to enable them to maximize their profits around these stations. We can achieve a lot of goals we want around growth and development issues, but we've got to have that permanence for the development community that plans aren't going to change or that they're going to be in place long enough for them to realize the benefits of their investment.

So, again, we've covered a lot of these things so I think that what we need to do, what would be really helpful for BRT as a mode, is to get some kind of really good demonstration project going, like you showed in South America. I think that Americans just don't really understand this quite well. We think about things -- the 34th Street bus way in New York, combined with the Pittsburgh example, combined with LA, and there's a lot of confusion about what these things are and what they can be. A really good demonstration project, I think, would go a long way in this country to helping kind of get this pushed forward.

If I have one request it would be to make sure that it's really super high-tech. I think that this is something that we kind of avoid when it comes to some of these investments because they're easy to cut, but when you go to places like Japan, when you go to Europe, when you see the application of technology, particularly information technology, to those transportation systems, you see just how far apart we are here in this country.

So, let me just go ahead and stop there.

MR. CÁRDENAS: Thank you. Thank you, Robert.

(Applause)

MR. CÁRDENAS: Well, we still have about 20 minutes for a conversation. I think -- I'm happy you said that, especially the idea that when you look at transport systems you have to be able to do the analytics and understand what the problems are, what the market is, and not to stick to one mode, per se. So, I think that's a very important message. And the reason I emphasize that is because it could be in the -- the idea could be that the BRTs are perfect and they have no problems and I think that the report is -- does justice to some of the issues that have been raised in these cities

that have adopted the BRTs, especially in Latin America.

So, I think we should talk a little bit about that, about those aspects, and maybe Dario could actually mention some of them. I can think of one that is very important in Bogota, which is congestion and overcrowding of the buses, but there are others. That's not the only issue. Coordination with the other modes of transportation is also an issue.

So, maybe we can talk about these aspects that balance a little bit the view on the BRTs.

The other element, and I did mention this only to be part of the conversation, is that these are more than just transport systems, these are also cultural transformations and transformations in terms of the entire urban planning of these metropolitan areas, and what I mean by cultural transformations, a member of the city council of Bogota was recently kicked out of the city council. He lost his seat and the reason was that his car invaded the bus way. So, you saw the picture, you know, the bus way was empty and the other lanes were clogged, so, of course he had the incentive and he thought he was a council man so he could ride on the bus way.

Well, the good thing is that the community, the legal system, does not tolerate that and of course he lost his seat because he did something that was unlawful. That shows the type of culture that is associated with these transformations.

So, I think those elements are very important to the success of BRTs and we have to make sure that they are aligned before these systems are (inaudible).

And the last element I wanted to note, last week I was teaching at UNLV in Las Vegas and I went to see their BRT and I saw the bus way, but I didn't see the buses, and I didn't see the buses because they told me I had to wait for ten minutes, and

that of course shows that the systems are not that popular or they're being adopted in places where there is not enough density or that they still do not attract enough people, people prefer their cars.

So, we have to think about also examples of BRTs that may not -- that may have or may have not succeeded here in this country because that of course also helps or damages the viability of these initiatives like the one you are promoting in Montgomery County.

So, maybe we should ask the floor to make comments and questions and then we'll give the mic back to the panelists.

Yes, please. And if you could just introduce yourself.

MS. WU: Good morning. Thank you very much for your very interesting presentation. My name is Irene Wu. I'm from the Federal Communications Commission and I was curious that you mentioned that in the implementation of these systems in Japan and Europe that they were very high-tech. I wonder if you could expand a little bit on what information communications apply.

MR. CÁRDENAS: Okay. Could we collect a few so that we'll then --

SPEAKER FROM THE AUDIENCE: A quick question comparing South America to Montgomery County, the importance of public transit feeder systems into the BRT trunk. I'm just wondering if it might be a different situation in Montgomery County because it was developed as a more car-centric community than maybe some of the urbanized areas in South America.

MR. CÁRDENAS: Yes, please? The microphone is coming.

SPEAKER FROM THE AUDIENCE: Imagine how good I feel as a graduate of Ohio State University to see such excellent work done here. And also I

worked on Colombia for a lot -- even wrote about the railroads, but that was a long time ago that railroads were a big deal for Colombia.

The issues that you didn't mention, I just want to see whether you would talk about them, one is the externality associated with the fact that somebody rides in the BRT is saving the car driver a lot of time. That would seem to me to be a point that you could make to people that would maybe convince those guys way out in Damascus, Maryland that they're glad to have BRT operating.

But the second is, you don't mention so far the cost effectiveness, or at least the details of it, of the benefits overall in terms of lower costs per unit. At least nobody has talked -- mentioned that. And I was looking for it.

MR. CÁRDENAS: Good. I think Dario can make a reference to that because it's in the report.

Anyone else? The two of you in the back. The woman in the last row first.

SPEAKER FROM THE AUDIENCE: I was curious if there is any example of BRTs that are fully funded privately. It seems to me that it may solve the question of impermanence that, you know, BRTs are subject to the wiles of political winds if it's all funded privately.

MR. CÁRDENAS: That lady. Thank you.

SPEAKER FROM THE AUDIENCE: Hi, this is a question for Mr. Zimmerman. I'm Erica from Embark. You were talking about how the alternatives analysis process and some sort of cost-effectiveness evaluation at the USDOT is going to be eliminated. I guess I don't really know much about that and I don't understand why it's bad and what we need to do about it, so if you could just explain that a little further.

MR. CÁRDENAS: All right, I'm going to take two more. Yes, please?

MS. CONNER: Hi, Elise Conner, the Senate Foreign Relations Committee. I am curious to find -- I know in DC we have a huge problem with the metro with the funding gap and if there are plans, especially with the systems in Latin America, to have graduated increases in fares or how that works to address the infrastructure down the road when the systems start to deteriorate a little bit, if that's been -- how that's been addressed or thought out.

MR. CÁRDENAS: All right, I think that's it. Well, the last one.

SPEAKER FROM THE AUDIENCE: Hi, my name is Chloe (inaudible). I'm from UCLA in the UK. I was curious to know your views about personal safety and citizen security which is also a big problem in Latin America but also in the U.S., and it's very much related also to public transportation in some ways. And I was wondering if you look at these issues?

MR. CÁRDENAS: Great. Very good that you brought that into the conversation.

Well, let's do this. Let's start in reverse order, so why don't we start with Robert and then we'll go to the rest of the panelists. You can address, you know, some of them, not all of the questions.

MR. PUENTES: Good. I don't think I can. I'll just be very brief. I think the question on the -- kind of the high-tech kind of component to this, I think that people will take whatever mode they want to get to whatever it is they want to do, right, they will choose a highway option if that works, they'll chose a rail option, they'll choose anything, but I think that they want something that's convenient, that's safe, that's flexible, all that kind of stuff.

The one thing I think that we don't have in a lot of ways in this country is the information about the transit system. And on the rail side it's very easy because you know where it's going, right? You can go to the station, you can see the rails, you know where it's going.

So, for BRT I think what we really need to do with the bus systems in general is to outfit these things with as much information technology as you can find. I mean, the next bus stuff that we have here in this region I think has changed the way a lot of folks are commuting. So, mostly I'm thinking about just information technology and providing as much real time, accurate information to riders as possible, and the more you can do that, I think, the more attractive it's going to be for more riders. We just don't do enough of that -- I mean, you think you do enough of that, then again you go to these other places, oh, my god, it's off the charts compared to what we do here.

In terms of the public-private partnerships, I couldn't agree more. I think that we need to be thinking about lots of different funding and finance mechanisms for all these different modes, but I think that BRT could have -- could be one of those things that are open for different funding mechanisms as opposed to, you know, waiting for the federal government to rain money down on states and then they'll choose projects. I think we need to move away from that kind of funding and project finance model and public-private partnerships are definitely a way to do that and I think that that also helps expand our notion of what we mean by these public-private partnerships. It's not just leasing a toll road in the Midwest, but it is this kind of public provision of infrastructure or public land component or whatever it is, mixed in with the redevelopment kind of component that's privately run.

So, there's lots of different ways to do it and I definitely think that would

help overall. Whether or not it helps with the permanence issue, I'm not so sure. And I wonder -- when you said that, I wonder if actually that's the other way around. Maybe what comes with the public provision is that you get some more permanence because they don't do things very fast. You know, you've got to have an assurance it's going to be there for a while, but certainly, I think that is possible.

MR. CÁRDENAS: Thank you. Sam?

MR. ZIMMERMAN: Yeah, I'm a little puzzled on this permanence thing. Remember what I said, it's not a bus service, right? If you spend X million dollars on the technology and the architect-designed station, the modal integration terminals, a dedicated right of way that's physically separated, maybe you can tell me how impermanent that would be. It's not a bus service; it's an integrated system that includes stations, terminals, and running ways. If you spend money on a high-tech vehicle, let's say a hybrid vehicle that can go two and a half, three miles, as they can in Seattle, under electric power, and it's guided, like they are in Cleveland, so they can stop next to -- within a couple of inches from a platform, you're not going to eliminate the service with any higher probability than you did with all the streetcar systems all over the world that are gone now for a cause and it wasn't all GM.

So, let's lose this permanence argument. Cleveland has the kind of system that I would call BRT by any stretch of the imagination and there are billions of dollars of development that have occurred, both private and public, around its stations. So, are they going to be disappearing? I don't think so. Are the vehicles going to be sold off with the doors on both sides? I don't think so.

So, let's lose the permanence argument. On the capacity business --

MR. PUENTES: I think they just mean in terms of the planning of it. I

mean, this is -- in terms of when the development community comes in --

MR. ZIMMERMAN: One thing that's happened, like in Pittsburgh where there's a bus way, it's not BRT -- in the east there's been a lot of development and everybody was surprised about it. You can catch a bus every five minutes in the peaks, every 15 minutes in the off-peak that goes, without congestion, to downtown. And miracle of miracles, there are 30,000 people a day using the service which is more than use the light rail system in Pittsburgh, and there's been all kinds of development.

I think the point can be made that very few BRT systems other than Cleveland were seen as a development tool as well as transportation. The development happened and everybody said it's a miracle, because everybody knows that bus systems don't have development and so I think the point can be made that we have to start, in this country, thinking of BRT as a development tool not just transportation, getting over this myth that they're impermanent and they're only used by people that the developers, like in White Flint apparently, don't want around them.

On the thing about congestion and crowding, remember the Yogi Berra quote, I think it was about Sardi's restaurant, "It's so crowded that nobody goes there anymore."

SPEAKER: That's TransMilenio.

MR. ZIMMERMAN: Yeah, TransMilenio was so crowded that nobody wants to use it, right? Well, anybody been on the Lexington Avenue subway lately, the number five or the number six? Or anybody been on line number one in Beijing, also very crowded.

So, you can't optimize, either it's too crowded, or Las Vegas, it's empty. Obviously -- which is why I said irrespective of what the wheels are made out of or what

the mode is, start with the market, that's very important. And then design the appropriate services to go with that, whether they're bus or rail, and then so on. And also this point about integrated systems is extremely important. In places anywhere where you've developed a metro system as a stand-alone, New Delhi as a case in point, or to a certain degree Metro here, without consideration of how it would fit in with the bus system, whether it's BRT, Metro, or whatever, they've been frankly very short on the ridership because the last mile is as important as the mile on the guide way, same thing with BRT. If you plunk a BRT system down and say, well -- like in other countries where the developing world where you have a lot of mini buses, jitneys, and ignore them because it's very tough to deal with them. The unions, they don't want to do anything, then you've got a real problem.

On the federal process, frankly there's been a lot of commentary on how long the alternatives analysis process takes in part because -- I don't know whether it's incompetence or chicanery, people aren't always honest about looking at other options or up to par. So, there's a lot of talk -- there has been a lot of give and take between the FTA staff, consultant world, and local and regional authorities during the alternatives analysis process. They take a long time. But if you're talking about billions of dollars, maybe you should do some thinking about it beforehand.

And so in a rulemaking process dealing with the inordinate amount of time taken for alternatives analysis, the lobbyists, frankly, for the rail systems have said, oh, we've got to get rid of it. It takes too long. Right? We have to think too hard.

The other thing was the evaluation process included a lot of different factors. Cost effectiveness narrowly defined -- and it shouldn't be narrowly defined -- focused on travel time for all riders and people in cars as well as new trip making. The

streetcar community in particular doesn't like that because the point has been made about streetcars that even if nobody uses them, literally, I mean, I'm talking ridership 300 a day, 200 a day, look at all the economic development impact they've had.

I go all over the country and I see -- and I ride on them, I like them, what can I say, but I don't see anybody on them either and yet they're sold as economic development, you know, tools. My point is that there are ways to look at economic development, but fundamentally if nobody uses them, they don't provide transportation value, they're unlikely to have economic development effects and the land effects come as much for all the other things you do, the good planning that you were talking about, as they do for the transportation investment if it's done in the right way.

Well, anyway, the point is, that lobby has tried to sort of gum up that evaluation process to include a lot of more hand waving things like, well, you know, automatically if it's a streetcar equals -- that equals development, right? And if it's not, it doesn't. So, I think there's been a lot of political pressure on the Administration and the Congress -- and again, this is bipartisan -- to sort of dumb the process down, sort of include all kinds of foggy evaluation criteria, and I'm not beyond land use and economic development. I think those are the key issues, really, but there has to be some kind of objective analysis of those effects.

And then also the notion of looking at options. The rulemaking said, well, we know we want to build a rail system, why are you forcing us to look at bus options? We know it's rail. We don't want the evaluation process to include it, we don't want to look at it, we've made our mind up. That's it. So, anyway.

MR. CÁRDENAS: Okay. Thank you.

MR. ELRICH: Okay, so I wrote these questions on my coffee cup. A

couple things come to mind. One of the gentlemen asked about integrating cars and buses in the discussion and I've raised this in the county that we need to think of these things as opposite sides of the same coin. I mean, the coin is transportation and some people are always going to come there by car. There is nothing we can do and no transportation system we can build that will get everybody out of their cars. And it doesn't make sense as transit advocates, as some people do and some of the smart growth people say, is that we're going to turn the roads into hell and then we'll hope people ride transit, because, A, that doesn't work really well and people get really pissed, and if you really can't handle all these people in transit, there's no point in turning the roads into hell because you can't get them to switch anyway.

So, you need to take an integrated approach and I've tried to say, look, you know, everybody I get out of a car into transit makes the road run better. And I'll say that the state highway actually gave credit in their new thinking, one of them saying we're going to focus on getting people through intersections rather than vehicles through intersections, and they've said that they like the BRT because it extends the life of the roadway. They can use additional lanes for -- to accommodate -- use the existing lanes to accommodate additional growth in the county because the BRT takes enough vehicles off the road that they're not forced to look for road solutions and I think that's a good thing.

So, I think you've got to have balance.

Somebody talked about bus integration and the system, one of the things that I think is absolutely critical is not treating BRT systems as add-on systems, like you've got an existing bus or light rail and then I'm going to build a BRT. You need to reconfigure your whole transit system and I've, you know, taken the approach in laying

out the system I laid out, which is step back, look at it from 1,000 feet, how does this all fit together? And what we've proposed in the county is reconfiguring the entire ride-on system. We put out 350 buses a day, and WMATA runs on a bunch of routes, you know, George Avenue, 29, what have you, and their buses are all mired in traffic. So, some of those buses become BRT buses, they get off the road, they run up on the guide ways, they're out of the traffic flow, and you turn your ride on system, which today takes people all over the county from one end to the other and you turn it into a feeder system to the main lines which means I can take those same buses, get them in and out of neighborhoods with greater frequency at every half hour which makes that more appealing to people, and get them to a mainline where the service runs like it should run every six to eight minutes during rush hour, I can push people, you know, to where I really want them to go without sticking them in traffic on the ride on buses.

Parsons Minkerhoff, which is doing our study, came back with a preliminary about two weeks ago. They said twelve of the lines that I proposed absolutely make sense, have ridership of 10,000 or more, two of them have ridership of 40,000 or more. So, this is something that we're really encouraged by. And then they said, which fascinated me; we didn't give them enough money to study either parking changes or integration of the bus system. They said: if you integrate the ride on into this or if we can look at parking places -- places to build parking, we think these numbers go up 20 to 30 percent beyond what you've got, and that takes some of the marginal lines into the doable lines. So, I was really struck by that and I think integration is absolutely critical and you've got to get out of this thinking like you're just going to layer on a BRT system on top of everything else.

The county is looking at public-private partnership. We were actually

approached, we've been approached by no less than four different large multinational, multibillion-dollar corporations. One of them sat in the county executive's office and said: we're ready to go to Paris, ask for a \$300 million equity investment to be partners in that. Unfortunately, the county doesn't work that way so we had to study it.

But, you know, I've been intrigued because, you know, I think this is, you know, a really promising thing. The thing is you've got to keep from getting your clock cleaned in a public-private partnership and, you know, we don't know much about it. The state admittedly doesn't know much about it. And you don't want to get into a deal that winds up breaking the bank or winding up with something that doesn't work.

On the flip side of that, the private partners have kind of said, we actually don't care so much about Montgomery County, but we see this as something that we can sell around the country because you're next to the Capitol and because somebody from some other city will come to DC asking their congressmen for money for a transit project in their community and if we can put them on the Red Line and take them to Montgomery County and put them on a BRT system, we think we can sell them. So, you're not as important as what we think we can do by selling the stuff.

And I'll end by saying that I was intrigued because I went to this conference that Sam's folks help put on in Cleveland and the thing that struck me -- I think it was -- other than (inaudible), I was the only politician there. This thing was filled with all the transit people from the major cities in the United States which often don't have BRT and everybody's at this conference probably having reached the same conclusion which is, the only thing we're going to do is BRT. We don't have the money for the other stuff, which is why I think that the issue about the federal guidelines, whether you count cost effectiveness, is critical because I actually believe you have to count cost

effectiveness. We don't have an unlimited amount of money. We simply don't have it, and the transportation needs in this country are so great that if we disregard cost effectiveness and let people build expensive, sexy rail lines in lieu of BRT which could basically carry the same people but doesn't have the panache that the rail line has, we will use up the money and build far fewer lines. I mean, there's no way around it. There is a finite amount of money. By the way, I'm a very liberal, left wing Democrat. There is still --

I say that because it's important. No matter what your ideology, money is the limiting factor. I cannot print it or invent it. And you need federal policies and you need state policies, frankly, that take that into account.

You know, when you get a ridership estimate on a light rail and a BRT option and the ridership difference is 4,000 riders and the cost difference is \$1 billion, you ought to think about what you're doing, and I really think it's critical. I mean, we've got to be honest, and politicians have to stop lying to people and telling them we're going to build all these pretty things, you know, come to my (inaudible), tell me what you want. Yeah, I'll do it.

We're not going to do it, so we've got to be square with people about where we sit in all this.

MR. CÁRDENAS: Good. Dario, you have the last word, hopefully a short one because we're already over our time limit.

MR. HIDALGO: Well, so I invited people to look at the piece we produced together with Ilene Corrigan my colleague in the back, also from EMBARQ, and just a small clarification, I am director for research and practice, not the whole EMBARQ, so just to make clarity for that. I just need to put that on the record.

MR. CÁRDENAS: All right. Well, I hope the director is happy about the record too.

MR. HIDALGO: I hope so.

MR. CÁRDENAS: Well, thank you very much. I think this was an enlightening conversation and I hope that we'll see some of its results hopefully soon.

Thank you.

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