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# BUS RAPID TRANSIT AND OTHER BUS SERVICE INNOVATIONS

## HEARING

BEFORE THE

## COMMITTEE ON BANKING, HOUSING, AND URBAN AFFAIRS UNITED STATES SENATE

ONE HUNDRED EIGHTH CONGRESS

FIRST SESSION

ON

THE REAUTHORIZATION OF THE TRANSPORTATION EQUITY ACT OF THE 21ST CENTURY

JUNE 24, 2003

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# BUS RAPID TRANSIT AND OTHER BUS SERVICE INNOVATIONS

**TUESDAY, JUNE 24, 2003**

U.S. SENATE,
COMMITTEE ON BANKING, HOUSING, AND URBAN AFFAIRS,
*Washington, DC.*

The Committee met at 10:03 a.m. in room SD–538 of the Dirksen Senate Office Building, Senator Richard C. Shelby (Chairman of the Committee) presiding.

## OPENING STATEMENT OF CHAIRMAN RICHARD C. SHELBY

Chairman SHELBY. The hearing will come to order.

I am very pleased this morning to convene on a topic that is a high priority for the Banking Committee this year: The reauthorization of the Transportation Equity Act of the 21st Century, what we call TEA–21. TEA–21 expires on September 30, 2003, and Senator Sarbanes and I have been actively preparing for the revision of this legislation.

On March 13, the Committee heard from the Federal Transit Administrator, Jennifer Dorn, on her Agency's fiscal year 2004 budget priorities. Embedded in that proposal were several groundbreaking initiatives which I thought had potential, like the changes suggested to foster programs like Bus Rapid Transit, and some initiatives, like eliminating the bus discretionary program and also lowering the Federal match for New Starts projects, that I have concerns about.

Today, we are here to learn from the Administrator and the distinguished panel of witnesses that will follow about Bus Rapid Transit and other bus service innovations. Bus Rapid Transit, or BRT, is a new technology that was not around during the writing of TEA–21, and evidence exists that many communities around the country are now giving it serious consideration. In fact, when I asked that Members formally make requests to the Committee of projects in their State that they wished to have authorized, almost 50 communities in 22 States submitted requests for authorization for BRT or enhanced bus programs. The total amount requested for this technology hovers at about $5 billion. This certainly demonstrates the level of interest for BRT and bus improvements.

In response to this heightened level of interest in 1999, the Federal Transit Administration created a special program within the Agency's research office to study BRT, and I have asked the Administrator to share insights from that experience with us today.

We have also assembled a panel who each have varied experience with this new technology and have recommendations for reauthor-

ization. The GAO has already done a study called "Bus Rapid Transit Shows Progress." The National Bus Rapid Transit Institute, part of the University of South Florida's Center for Urban Transit Research, also has a representative here. We have two real-life examples of BRT projects: The first in Eugene, Oregon, that, while still in the development stage, shows promise; and a second example that has been implemented with great acclaim in Colombia, South America. Finally, a representative of the Surface Transportation Policy Project is also joining us this afternoon to talk about bus service improvements generally and how transit decisions contribute to land use and community development.

One final note. While I certainly believe that BRT is a viable option worthy of consideration in communities where it makes sense, I believe that at the Federal level, on this Committee and within the Department of Transportation, we should remain mode-neutral. No one knows better about what will work in a particular community than those that are living and working in those communities. While BRT has been touted as a potential replacement for the more capital-intensive light rail, I feel it best for communities to make that determination at the local level.

For some communities, light rail is a more appropriate choice based on ridership potential, density, and cost considerations. One thing we want to make sure of in reauthorization is that we have a program which gives local communities maximum flexibility to choose the right project based on their needs.

With that, I will ask for other opening statements and then let the Administrator proceed with her testimony.

Senator Reed.

**STATEMENT OF SENATOR JACK REED**

Senator REED. Thank you very much, Mr. Chairman, and thank you for holding this hearing on Bus Rapid Transit. It is always good to see the Administrator here.

I want to commend you for this hearing and your focus on reauthorization of the TEA–21. I also want to associate myself with your comments about the flexibility and the local discretion that is so important and such a hallmark of ISTEA and TEA–21. And I also believe, as you do, that we cannot have a one-size-fits-all Federal prescription for transportation, and that the local needs of communities have to be addressed and they are best addressed by local decisionmakers.

The only other footnote I might add is that I also would hope that we would not use Bus Rapid Transit as a way to deny appropriate resources for capital-intensive programs. BRT should not be used as a budget device. It should be used as a way to meet the local needs of communities which feel that Bus Rapid Transit is their preferred mode of mass transit.

Let me thank the Chairman for his strong support of my State in terms of the bus discretionary program over the last few years. I represent a State which has a statewide bus system, no light rail, no subways, and we find it extremely useful and effective. Rhode Island is not like other places. So, again, I go back to the point the Chairman made that we have to have this local flexibility.

As we go forward, we are going to look at many different aspects of transportation and mass transit, and we come back, I think, to the point that has been made by the Chairman and myself. We have to maintain flexibility and local discretion. We do not want to stack the deck against one mode of transportation or for one mode of transportation. We really have to recognize that the resources must be there for the program.

I thank the Chairman and yield back my time.

Chairman SHELBY. Senator Stabenow.

**STATEMENT OF SENATOR DEBBIE STABENOW**

Senator STABENOW. Thank you, Mr. Chairman, and good morning. And thank you for this very important hearing and welcome.

I, like my friend from Rhode Island, come from a State where we do not have subway systems. We are focused very much on buses in every one of our 83 counties. That is an incredibly important way in which Michigan's citizens move through public transportation, the bus system. So as we talk about transit, it is very important to me, representing Michigan, that we are not just focusing on rail or subway systems.

We are interested in Michigan in adding to our light-rail systems, but what we are talking about today is very important in terms of innovations in bus transit. I think that is something that has a tremendous impact in Michigan.

This is of great concern to so many people in Michigan who are attempting to get to work every morning at great odds. Yesterday morning, I heard a piece on National Public Radio about low-wage workers, and one person that was featured was a Detroiter, Marzs Mata, who works for Comcast Customer Service in one of Detroit's suburbs. She commutes by bus from downtown Detroit, and it takes her 5 hours a day to go to work and to come back. And this is obviously a grave hardship to her and yet as a person who wants to work and earn a living, this is what she is required to do. So issues related to buses and innovation regarding bus systems are very important in Michigan.

I would just say, Mr. Chairman, I would appreciate putting my entire statement in the record.

Chairman SHELBY. Without objection, it is so ordered.

Senator STABENOW. Thank you. I just want to emphasize one more time that Michigan currently ranks last in Federal transit funding among the Great Lakes States. We are receiving approximately 43 cents on the dollar, even though our citizens are paying a tremendously high proportion in terms of local taxes to support public transportation because it is so important to the quality of life to people in Michigan.

So, I am anxious to have the opportunity to continue to work with the Committee and create a way that would be more fair for my State and other States that have needs, that do not have extensive subways, and are not heavily financing light rail but have tremendous public transportation needs predominantly through buses and have the great need that our citizens are asking us to address.

Thank you, Mr. Chairman.

Chairman SHELBY. Senator Sarbanes.

## STATEMENT OF SENATOR PAUL S. SARBANES

Senator SARBANES. Thank you very much, Mr. Chairman, for holding this important hearing. This opportunity to examine the state of bus service in this country and ways of improving and enhancing it is extremely important. Buses, after all, according to APTA, provide 60 percent of the more than 9 billion trips taken on public transportation each year. There are more than 2,200 transit agencies in the country providing bus service.

Obviously, we are not reaching our full potential on bus service, and as we shall shortly hear from our witnesses, communities around the country are improving their bus service in a variety of ways. The new technology that made it possible for transit agencies to provide real-time information to waiting passengers about the expected arrival time of their next bus—that, of course, does not take care of the problem of getting the bus there. It just tells them when it is coming. These technologies also enabled transit managers to track the exact location of buses to respond more quickly to problems, for getting the buses that are operating cleanly and quietly with low emission or zero emission fuels. This, of course, brings down the pollutants emitted by transit vehicles. To the extent we can increase transit ridership, get fewer cars on the road, we address both the pollution problem and the congestion problem.

There are a number of innovations underway. Traffic signal preemption improves bus speed and reliability, limiting the number of stops which cost you on convenience but you gain it on time, utilizing new fare collection techniques. There are a number of things that are being tried—and I know we are going to hear about them in the course of the testimony this morning—that could significantly improve bus service in America.

The other focus we have today is, of course, the emerging technology of Bus Rapid Transit. There are a number of questions that I think we need to look at: How effective is BRT in cases where you do not have a dedicated right-of-way? What kind of impact can these projects have on local land use and economic development? Do we have enough experience with this technology to accurately predict ridership and cost figures for these projects? And I think we need to examine this very carefully as we consider this proposal.

Mr. Chairman, obviously one of the things that would contribute tremendously to improved transportation is just to significantly raise the level of service with respect to bus transport. And that is something we need to develop as we move ahead with the reauthorization this year.

Thank you very much.

Chairman SHELBY. Senator Miller.

## STATEMENT OF SENATOR ZELL MILLER

Senator MILLER. Thank you, Mr. Chairman, and thank you for holding this very important hearing and giving us an opportunity to focus on the possibilities and promise of Bus Rapid Transit.

It was a year ago tomorrow that I participated in the Housing and Transportation Subcommittee hearing regarding the positive impact of transit on the environment and on the economy. I bring that up because in that hearing, one of Georgia's corporate citizens, Bell South, testified how they maximized land use to locate nearly

10,000 employees by building new office buildings over or near MARTA rail transit stations. This is the type of cooperation between private entities, the local community, the workforce, and the State and Federal Government that helps reduce commute times, congestion, and the negative impact of car emissions. So, I am interested in how Bus Rapid Transit will be able to achieve these goals while maximizing land-use possibilities.

I look forward to Administrator Dorn's testimony regarding any efforts to facilitate cooperation between the Federal Transit Administration and the Federal Highway Administration that can help State DOT's implement Bus Rapid Transit, with HOV lanes and dedicated fixed guideways. Additionally, I would like to hear the Administration's views on a clear definition of Bus Rapid Transit and its eligibility for New Starts funding. Will it be defined broad enough to encourage BRT development where feasible, but narrow enough not to substantially diminish the positive impact of the New Starts program?

I welcome both these panels and thank you for being with us.

Chairman SHELBY. Ms. Dorn, your written statement will be made part of the record in its entirety. You proceed as you wish. We welcome you again to the Committee.

**STATEMENT OF JENNIFER L. DORN**
**ADMINISTRATOR, FEDERAL TRANSIT ADMINISTRATION**
**U.S. DEPARTMENT OF TRANSPORTATION**

Administrator DORN. Thank you, Mr. Chairman, and it indeed is a pleasure to be here today to testify about Bus Rapid Transit, as well as significant bus improvements. I am confident that both will make an inroad in increasing ridership on public transportation throughout the country. I would like to associate my own remarks with the remarks of all of the distinguished panel members with respect to Bus Rapid Transit. I think that we are on the same page with respect to maximum local flexibility. This Administration shares that philosophy. This is not a trick to try to drive a local decision toward one mode or another. FTA's philosophy in its proposal on reauthorization is surely to enable communities to take advantage of a full panoply of options and to allow them to make the decision. You are right, Mr. Chairman. Those decisions are best yielded to the local level.

I would like to make several summary points, if I may, about the exciting success of Bus Rapid Transit and what it means for increasing ridership and community benefits in cities today. And I would also like to clearly state what the Administration intends and what it does not intend through its reauthorization proposal.

The proposal, part of which we are discussing today, permits nonfixed guideway and other new lower-cost, nonfixed guideway technologies like Bus Rapid Transit to receive New Starts funding. Others will testify today about how BRT in certain corridors has significantly increased ridership, has dramatically reduced travel times, and in most cases at a fraction of the cost of light rail. Advanced technologies, as many have spoken to, have made this possible. FTA joins GAO and a number of expert transportation organizations in some 50 communities in 22 States, as you mentioned, in recognizing the importance of maximizing the potential of these

technologies, where appropriate, in order to achieve all the important benefits of public transportation in communities.

First of all, a word about defining Bus Rapid Transit. I think it is very, very important to note, from our perspective, Bus Rapid Transit is not a predetermined set of physical characteristics. Fundamentally, BRT is a service. It is performance-based, with the defining characteristic as speed and travel-time savings. BRT utilizes a combination of advanced technologies, infrastructure, and/or operational investments to achieve speed and travel-time savings. And it provides significantly better service than traditional bus service: Faster operating speeds, greater service reliability and frequency, and increasing convenience, often matching the quality of rail service in appropriate applications.

In other words, BRT as a performance-based service can include a whole spectrum of choices, a combination of improvements that can be used to achieve these results, from improved passenger facilities to improved vehicles to improved service. And we can get into that more fully in the question period, as you see fit.

I would like to make a couple of important points with respect to our reauthorization proposal.

First, our goal is not to convince, to compel, to force, as some might fear, every community to choose BRT. Far from that. BRT does not make sense for every corridor or community, just as light rail does not make sense in every community. FTA has been and will continue to be supportive with this proposal that we need to be mode-neutral, as the Chairman noted.

The type of investment is a local decision, and FTA's role is to ensure that the project meets the statutory criteria for mobility, for cost-effectiveness, and for other important measures.

Given the remarkable success, however, of current BRT projects, we do hope that every community considers BRT, as well as other emerging transportation technologies, in the beginning stages as they investigate cost-effective transportation solutions in travel corridors. We will, of course, continue our aggressive education and technical assistance efforts to promote such consideration by transit agencies and communities.

We believe that by making nonfixed guideway major capital investments eligible for New Starts funding, we will simply create a level playing field in the decisionmaking process locally. It will permit each community to choose the project that best meets its transportation needs, regardless of whether it utilizes a fixed guideway.

Right now, project sponsors need to follow the money, and the money is limited to fixed guideway projects, even though the success of BRT is not. We have a number of BRT projects utilizing fixed guideway that would compete successfully under the New Starts criteria, and we want to continue those types of projects.

Even with its potentially lower cost, we understand that BRT will not be the right transportation solution for every community, as I mentioned. Cost alone is not a determining factor in the New Starts program.

In evaluating New Starts projects, we look at cost-effectiveness, that is, whether the costs are in line with the benefits achieved. Considerations like population density, the existence of exclusive rights-of-way, centralized employment centers, and the impact of

topography on system design and construction costs may make light rail, for example, more cost-effectiveness than BRT in a particular community or corridor.

A second important point, we do not intend to change the philosophy or the intent of the New Starts program. This Administration continues to support a New Starts program that provides Federal funds for corridor-based capital investment projects that fully meet all of the evaluation criteria established in law.

In contrast to formula programs, New Start monies are intended to target problem corridors or areas where significant focused investments are required to solve problems. We simply want to ensure that communities are able to consider the full range of the potential solutions and make common-sense decisions about what best meets their needs.

I know that some have expressed the view that we need a precise definition of BRT in order to distinguish it from simple improvements of existing bus systems that should be funded under formula programs. I urge Congress and this Committee to resist doing so in statute. The performance-based criteria which Congress has defined for us in statute will naturally weed out projects that provide, for example, so-called random bus improvements.

In order to pass the New Starts test, BRT, like any other mode choice, will have to provide significant, distinguishable service improvements along a transportation corridor. That cannot happen without an integrated, systemwide set of service enhancements incorporated in a plan in the local level. BRT provides a menu of options, and that is the key—a menu of options. We are fortunate to have so many advances in technology as to be able to pick from Column A and Column B to solve Problem C.

In our current process for fixed guideway projects, for example, we do not dictate the alignment, whether fixed guideway systems should be grade-separated or not. We do not dictate the distance between stations or whether fixed guideway systems should be electric or diesel locomotive driven. We do not say that it needs to be a commuter rail, a light rail, a heavy rail, or a ferry. We say that it must produce significant results and be on a fixed guideway. What we are saying is that fixed guideway is no longer the only defining characteristic that ensures significant public transportation benefits.

We do not want artificial constraints on the performance that might be achieved by mandating a particular combination of Bus Rapid Transit features. The definition of what kind of project can be funded in New Starts should be as flexible as possible, as long as the proposed project achieves significant mobility improvements in a cost-effective manner. This is particularly true with the rapid pace of technology improvements. Next year, it may not be BRT, it may be another technology improvement.

I would also note that the FTA supports the continued application of the current New Starts requirement that every New Starts project be incorporated into the regional transportation plan. This will ensure that cohesive capital improvement projects which address transportation problems in a defined corridor can be distinguished from a random array of bus service improvements. Those are more appropriately funded under the formula program.

Finally, Mr. Chairman—and thank you for bearing with me—I want to assure the Committee that it is not our intent to use the proposed changes in the New Starts program to divert funds away or toward any particular size or type of community. Some high-density urban communities that were previously unable to consider a fixed guideway system simply because they could not secure an exclusive right-of-way will now be able to consider comprehensive corridor improvements that do not require a fixed guideway. Some medium-sized, fast-growing communities that might not have been able to justify the high cost of a fixed guideway system may find that the transportation benefits do justify the cost of a nonfixed guideway investment. And some large communities may find that they prefer a lower-cost, nonfixed guideway alternative even if they could justify a higher rail system.

We may see an increase in the number of communities seeking New Starts projects, but we are also likely to see a decline in the average total cost of those projects once nonfixed guideway projects are permitted. I believe that the Administration's proposed 55 percent increase in New Starts funding under SAFETEA will permit us to expand the program to include meritorious nonfixed guideway projects even in the face of increased demand.

Thank you, Mr. Chairman.

Chairman SHELBY. Thank you very much for your testimony.

Your SAFETEA proposal includes a provision—you alluded to it a minute ago—to accommodate BRT in the New Starts program by eliminating the requirement that projects include separate fixed guideways. It seems to me that one of the central reauthorization questions, Administrator Dorn, is whether this is necessary to accommodate BRT within the current program structure. In other words, will opening up New Starts to nonfixed guideway projects dilute the program, particularly where there are so many projects already competing for New Starts funding? Would it be better, in other words, to fund such projects from the bus program?

Administrator DORN. That is a very important question, and we believe strongly that we do not want to dilute the purpose, the scope, the philosophy of the New Starts criteria. Whereas, formula programs are targeted toward general improvements, general system improvements, the philosophy of New Starts, as I understand it, was to target a specific problematic corridor or area that requires a significant investment in order to make distinguishable, significant improvements in service. We believe that the cost-effectiveness criteria that has been imposed, thankfully, by statute will weed out other less systematic investments that could produce less beneficial results. So, we have little fear about the dilution. We feel that the trade-off—a community making a decision that they need to go immediately to light rail, or they cannot afford light rail, but they are going to put it through anyway because that is where the money is—that is a significant impediment to good, cost-effective solutions.

Chairman SHELBY. And a mistake.

Administrator DORN. Yes.

Chairman SHELBY. While there have been some improvements in the reliability of the estimates of the cost and ridership in New Starts projects, a lot of us are very concerned that we are still see-

ing projects with costs that exceed estimates and ridership that falls short.

First, what can we do, Administrator Dorn, to make sure that we are getting reliable estimates of the project costs and, second, the ridership that would come after the project is completed? Sometimes that is faulty, as you well know.

Administrator DORN. Yes, Mr. Chairman. It is always imperative that we remain vigilant with our partners at the State and the local level to ensure that we are as accurate in our projections for both ridership and cost as is possible. Both the science of ridership projection and our experience have allowed us to improve significantly our record in that regard. And I would say that the vast majority of projects certainly currently in the construction phase have met the cost and budget outlines and many have exceeded the ridership projections. So we are getting better and better.

Because some of the projects were early on built under ISTEA with not as much experience as we have now—and those projects require years in the pipeline—we are seeing some lingering effects. But I think we are improving dramatically, and I am proud of our record. We can always be better, but I believe we are making significant improvements.

Chairman SHELBY. The Bush Administration has proposed a change in the New Starts program which would subject smaller projects, those with a Federal share of under $75 million, to simplified criteria. While streamlining the process—I think that is what you are getting at—for smaller projects might make sense in some instances, some of us are concerned that it is appropriate to make sure that all of our investments are justified. The draft bill does not provide any details on how this would work. Could you provide us more detail on what the criteria would be for New Starts projects with a Federal share proposed under $75 million?

Administrator DORN. A very important question, and the most important point, I think, is if it is the Congress' desire to accept this proposal for a simplified process for New Starts investments under $75 million, we would undertake a full public discussion with our stakeholders as to how to do this well.

But a couple of points. First, we think it is very important that we identify simpler measures for the project evaluation criteria, but stick with the same measures cost-effectiveness, et cetera. But there are ways that we can simplify those measures for smaller projects.

Second, we believe that we can streamline the project delivery mechanism so that it takes less time. Often projects that are under the $75 million level tend to be an indication that they are relatively small or uncomplicated or with less risk. So, I feel that we can very responsibly simplify and carefully simplify, and I also think it can ensure that we do not have an intimidation factor, particularly to smaller communities that have sometimes resisted or tried to get under the cap so they would not have to go through the process.

We think there is a very important benefit, as you have stated, that all projects that seek New Starts funding be subject to the rating criteria. We think these are very good, and help ensure that every investment we make is worth making.

Chairman SHELBY. Senator Reed.

Senator REED. Well, thank you very much, Mr. Chairman.

I think, Administrator, you have put your finger on one of the big issues, and that is the definition. And you have indicated that you want a performance-based definition: Speed, travel time, and savings. How specific are you going to be or should we be in terms of the performance criteria? Significant? Substantial? What do you mean by that?

Administrator DORN. I think we would use the same standard of cost-effectiveness measure, mobility improvements, land-use improvements. The same standard that we use for all projects under the New Starts criteria would be consistent for BRT. In other words, we do not, in some respects—I do not mean to be flip, but we do not care how they get the benefits as long as it is within the law. But if those cost-effective measures can be met, then to define specifically how they get there, whether they use an automated vehicle locator system or low-floor buses or whatever, we do not care. They need to be able to have the flexibility to choose, as they do now in fixed guideway. We do not prescribe what the station should look like, how far between they should be, et cetera. We just want to say at the end of the day you can prove that the costs are in line with the benefits achieved.

Senator REED. Is there consideration about emissions and environmental policy in your criteria?

Administrator DORN. The effect on the environment is one of the standards in the criteria that we use. We are trying to improve that measurement. It is not a fail-safe, quantifiable measure, and we need to make some improvements in that.

And the other measure we are really seeking to make some improvements on is how we can measure the economic development impact of an investment. And here, as Senator Miller pointed out as well, there can be Bus Rapid Transit investments that can dramatically improve economic development potential. It does not have to be fixed guideway.

There are a couple of areas that we want to work with our stakeholders on to be able to make the case even stronger, and hopefully we can influence the local community to concentrate more on public transportation in their decisionmaking.

Senator REED. What is prompting this new legislative proposal? What are the obstacles preventing a system from getting a Bus Rapid Transit system that you want to correct?

Administrator DORN. Currently, unless the project utilizes a fixed guideway, they have to use only formula funds. This prevents communities from carefully considering whether or not they could have a Bus Rapid Transit system, as many systems locally have already done, without a fixed guideway and still achieve the benefits. So, we want to level the playing field. We think no longer is the fixed guideway the determinant, the sole determinant of public transportation success.

Senator REED. Well, I think one of the problems you inherently have in trying to build in these flexibility and performance criteria is that, frankly, a system could propose simply that they would like money for HOV lanes, which they would claim is BRT—but looks a lot like a proposal that should be funded elsewhere.

How are you going to make the determination that this is a systemic—approach that is going to facilitate the maximum possible rapid transit and not simply a convenient way to do something that you could do otherwise?

Administrator DORN. Very good question, and we would, of course, become slightly more proscriptive after we have the public input process because there are things we need to learn about that. Should there be a floor, the minimum level of riders that would have to be impacted? That is the first point.

The second point is that it would be very unlikely that taking a single or even a couple or three interventions or measures would yield the significant increases in ridership and service that would meet the test of the New Starts criteria. An HOV lane on its own certainly, without a whole host of other menu options, is very unlikely to meet the test. And we will work carefully with our stakeholders, as we have done in fleshing out the New Starts criteria that the Congress gave to us years ago. We think that is the right way to go.

Senator REED. Let me ask a final and I think related question. How do you guard against the piecemeal approach where there is a grandiose plan but up front they just do HOV, they just do something else, and then either you cannot fund it or they choose not to follow through?

Administrator DORN. Typically, that kind of piecemeal approach is at the local option using formula funds. Unless we can establish that they are solving a significant problem on a holistic basis in a corridor that has a significant problem, it will not meet the criteria.

Senator REED. Thank you.

Chairman SHELBY. Senator Allard.

**COMMENTS OF SENATOR WAYNE ALLARD**

Senator ALLARD. Mr. Chairman, thank you. I apologize for not being here for opening statements. I do have an opening statement and I would like to make it a part of the record.

Chairman SHELBY. Well, it will be made part of the record without objection.

Senator ALLARD. I would like to follow up on some of your questioning, Mr. Chairman.

On the New Starts process, I would like to have you elaborate a little bit further about what it entails. Is it a two-tier process? Here are some of the questions I have: Would a $10 million project receive less scrutiny than a $40 million project? Would the $40 million project receive less scrutiny than a $70 million project, for example?

Administrator DORN. Good questions. With respect, Senator, to the New Starts criteria, it is multidimensional, and to describe it adequately would take more time and expertise than I have. But, in general terms——

Senator ALLARD. Ms. Dorn, we will take a written response for the record.

Administrator DORN. Oh, that would be terrific. Okay.

Senator ALLARD. Right, Mr. Chairman?

Chairman SHELBY. Absolutely.

Administrator DORN. I would like to make a couple of points.

Senator ALLARD. I think we need to make it a part of the record, if you would.

Administrator DORN. Okay, great. Just very simply, the project justification and the financial plan are the two big issues that we look at. And then I will be happy to provide more of the details.

With respect to your question about the scrutiny of $10 million, $20, $30, $40, the reason that the Administration has proposed to simplify the process for New Starts investments at $75 million and under is because, very typically, those projects are less complicated, involve less risk, and we believe there are ways we can expedite the process and the evaluation. We want to find the fine line between being customer-responsive and also meeting our fiduciary responsibility. We believe that that threshold is a reasonable threshold for which we would apply a simplified criteria.

Senator ALLARD. I was referring to projects under $75 million, but let's go to the $75 million threshold. I would expect that some communities might game this a little bit. They might have a project that is going to cost more than $75 million, so they may bring the costs down, or underestimate certain aspects of the project in order to have less rules and regulations.

Now, I do not know whether that is a problem or not. It might be a good thing because it brings about efficiency. On the other hand, it might mean we get obligations and they are not able to complete the project as planned. And then you do not have the money there to have an operating system that would measure up to expectations. Would you address that a little bit for us?

Administrator DORN. Certainly. Senator, we would view it advantageous to have some flexibility. To pick a certain number is always somewhat risky because you can game the system. And in some cases that is what has happened with having the exemption, which is in current law, of $25 million and under. We have had a number of projects that are $24.999 million; then they get into actually moving forward with the project, and they discover it is a $75 million project. Then they have to come back through the evaluation process.

So, we have some concern about that, but in talking with our stakeholders and reviewing this issue, we think $75 million in New Starts contributions is about the right level. We would like to have some—and we will work with the grantees for flexibility.

If we discover that there is a risk component that suggests that we need to expand the otherwise streamlined approach, we will do that. We will not back off from making wise choices about ensuring that the investment is going be something we are proud of at the end of the day.

Senator ALLARD. I want to move on to the BRT at this time. Are you visualizing the BRT as a harbinger, or intermediate step in moving to rail?

Administrator DORN. In some cases, it may well be an incremental step. In other cases, it may be wholly sufficient unto itself for the next period of time. That is why we do not want to mandate or have a separate pot of money. We want the local flexibility.

In a business analysis that all of the local communities should be making, that will emerge. The right project with the right fit will emerge.

Senator ALLARD. I understand that, and I think you are going the right way.

Now what about making this apply to rural areas? Talk about the BRT programs that apply just to rural areas which do not plan on going to the intermediate—thinking in terms of an intermediate step, they are just interested in a bus transit system.

Administrator DORN. Well, I think the greater impact on a rural area would be that the benefits we have already begun to see in terms of advanced technologies could be utilized in enhancing bus. So it may not be that it would happen very often that there would be a New Starts BRT proposal that would be cost-effective under the New Starts program.

Senator ALLARD. For rural areas?

Administrator DORN. For rural areas. I am sorry. That is the reason that the Administration has proposed a significant increase in the rural formula, because we recognize the needs, and we would believe that those increased formula funds, could be utilized to fund those kinds of investments.

Senator ALLARD. I see that balance. Thank you.

Administrator DORN. Thanks.

Chairman SHELBY. Senator Stabenow.

Senator STABENOW. Thank you, Mr. Chairman.

Thank you, Administrator Dorn, for your comments. Speaking again from a State that does not have subway or rail of any significance at all, the New Starts flexibility that you are talking about is very appealing to provide options for States like Michigan to be able to look at the very best way to be able to move people efficiently, cost-effectively, and so on. And we have seen a number of studies looking at options in Michigan, where we do not have infrastructure for rail, where they are seriously at the local level looking at BRT approaches.

Given Michigan and others who have very small return on our transit dollars, do you see the New Starts expansion of flexibility that you are talking about as a way to address States like ours to give us the opportunity to be able to bring more investment into our States?

Administrator DORN. Absolutely, Senator. We believe that some of those mid-sized and even smaller cities that do not have the potential benefits to justify the cost of a light-rail system or a trolley or even a streetcar may see the wisdom of making effective BRT choices that would increase public transportation. So, we think it is a window of opportunity, but, again, the criteria is universal that you could have a $4 million Federal share project that has incredible benefits, and it would apply to a mid-sized or a smaller city, and it could compete as well or better than a larger project that costs 20 times more and does not have as many benefits. So it is neutral.

There is also a recognition that the New Starts program is a national program, and there is an understanding on the part of the stakeholders and Congress that, as such, we need to share the wealth, so to speak. There has been expressed a fear, well, perhaps L.A. would identify, for example, 40 terrific Bus Rapid Transit corridors that would meet cost-effectiveness tests and hog all the money from the New Starts program.

I think that there is a strong recognition this is a national program and that there is an understanding that locally there have to be priorities chosen to present to the Congress, so that there is only one or at the most two projects in any one area at one time.

I think that some of these concerns are rooted in the fact that we are making a change rather than in the reality of the potential.

Senator STABENOW. Well, I certainly look forward to working with you on that. In Detroit, which is not a small community at all, does not have a subway in Detroit.

Administrator DORN. Right.

Senator STABENOW. We do not have rail in Detroit. So it becomes even more significant in large urban areas as well that do not have these options.

I am wondering on a local level, a local question. We have a new airport we are very proud of just outside of Detroit.

Administrator DORN. A great airport, yes.

Senator STABENOW. It is terrific, a tremendous investment and economic development opportunities there. But there is tremendous congestion on the highways between the airport and downtown, and there have been a number of proposals about how to better connect people, how to deal with the congestion, a wide variety of issues. And we are very serious about wanting to bring light rail or some piece, whether it is BRT or light rail, to that area. We have had various proposals directly related to the airport to downtown that are being proposed and submitted. Have you had any opportunity to look at those?

Administrator DORN. I know that our staff has provided technical assistance to the transit agency and the local planners to try to come up with ideas that will help meet the statutory criteria. So, we have continued to work with them. We have not been presented formally, I do not believe, any proposal. But we are eager to continue that work.

Senator STABENOW. Great. Well, it is an important area and an important need, and I look forward to working with you.

Administrator DORN. Thank you.

Chairman SHELBY. Senator Miller.

Senator MILLER. You have answered, and answered very well, most of the questions that I had, and I thank you. Is there a particular ridership BRT is targeting? I ask that because around Atlanta, we cannot get people out of their cars and onto the buses. If we build this system, will they come?

Administrator DORN. Very good question, and there are experts on the following panel that would be able to address that better than myself. What we have found is that if the service is fast, reliable, convenient, they will come. That is what has been so terrific the successful models of some of these Bus Rapid Transit systems.

The people that would not have otherwise ever gotten out of their cars, they say, "Why would I not?" When the headways between bus stops are 3 to 5 minutes and it is reliable, they utilize the technologies. It is going to change the face, I am convinced, of public transportation if we do this right.

Senator MILLER. Thank you.

Administrator DORN. Thank you.

Chairman SHELBY. Administrator Dorn, we appreciate you appearing with us today.

Administrator DORN. Thank you very much, Mr. Chairman.

Chairman SHELBY. We appreciate your candor and look forward to working with you.

Administrator DORN. Thanks a lot.

Chairman SHELBY. Thank you very much.

On our second panel, we have five witnesses, each with a unique perspective on this new technology. I want to welcome them this morning and thank them for their willingness to come before the Committee today.

We have Ms. JayEtta Hecker with the General Accounting Office; Mr. Gary Brosch with the Bus Rapid Transit Institute; Mr. Ken Hamm, General Manager of Lane Transit District in Eugene, Oregon; Mr. Oscar Edmundo Diaz, Chief of Staff for former Bogota, Colombia, Mayor Penalosa; and Ms. Anne Canby with the Surface Transportation Policy Project.

We welcome all of our panelists today. Your written testimony will be made part of the record in its entirety, and we ask each of you to sum up your testimony as quickly as possible to give us a chance to have a dialogue with you.

Ms. Hecker, you may begin.

**STATEMENT OF JAYETTA HECKER**
**DIRECTOR, PHYSICAL INFRASTRUCTURE ISSUES**
**U.S. GENERAL ACCOUNTING OFFICE**

Ms. HECKER. Thank you, Mr. Chairman. I am very pleased to be here before you and other distinguished Members of the Committee to discuss BRT. Our work is based on a comprehensive review, as you mentioned, of BRT and also significant work that we have done through the years for this Committee, including a report issued yesterday on the New Starts program. So, we have a body of work that we have been doing for you to base our remarks.

Buses, of course, are really the backbone of the transit system in the United States. As you estimated, nearly 60 percent of all transit rides are actually on buses; so it is a very significant dimension of the system. Also, BRT is really gaining the attention of communities for the potential to improve substantially the speed, reliability, and quality of this bus service over conventional service.

Chairman SHELBY. Would you take a second and just explain why it is getting the attention? Because of new technology in moving the bus or——

Ms. HECKER. Well, that is actually the first area that I want to cover. I have basically three areas, the characteristics of Bus Rapid Transit——

Chairman SHELBY. I will let you do it. I will back off for now.

Ms. HECKER. I am going to answer your question right away. I am just giving you the context of the three areas I will cover.

Senator SARBANES. While the Chairman is doing that, when you do the characteristics, do you intend to, in effect, lay out for us what you mean by Bus Rapid Transit?

Ms. HECKER. Yes, precisely.

Chairman SHELBY. That is a good point.

Ms. HECKER. I will cover the characteristics, the way the Federal Government currently provides support, and finally, the factors communities use in deciding whether BRT is an appropriate option.

I have a chart as do a lot of other panelists. Mine has some uniqueness because we have an overview of the diversity of different types of transit systems.

This first chart you see basically shows you different ways that busways are created. This is already the part that is covered, the fixed guideway. They can be tunnels. They can be at grade. They can be elevated. They can be isolated in different kinds of ways. So, the first characteristic or type is a dedicated busway.

Another type is HOV lanes, where they operate together with other types of vehicles, although it is a limited access road.

And the third type operates on arterial roads. It is, in our view, definitely a type of Bus Rapid Transit. It is not a dedicated road, but it definitely improves the system performance and substantially improves a number of characteristics. This is the model you have seen in Los Angeles. It is also part of the new Silver Line System in Boston. There are ways to achieve, by almost anyone's definition, a substantial improvement in the reliability, the speed, the performance, and the ridership attractability, even though it is not a dedicated right-of-way.

Chairman SHELBY. Why? Explain why, how it works.

Ms. HECKER. It is made more attractive. It has efficiencies in terms of use. There may be signal priorities that are going to help it move. There may be improved buses that speed entry so that it is more like a train. The entrance can actually be at the same level to help people with carriages and other things. It is very easy. There may be more doors to enter, so that you are achieving faster throughput. So, there is a whole collection of characteristics, none of which are in any given project, but you have this ease of boarding, ease of fare collection, often off the bus. You have more limited stops. You have improved stations.

A lot of these are made to improve the attractiveness, and they have successfully generated new traffic from former nonbus riders.

Senator SARBANES. How do you encompass that under the label "Bus Rapid Transit"? I mean, I think all those things are good. That is just a way of improving in a sense existing bus service. But how do you get that into the concept of Bus Rapid Transit?

Ms. HECKER. Well, I think Ms. Dorn's characterization of substantial improvements, not just general improvements but kind of an order of magnitude of improvements, that require in many cases some substantial capital investment. So it is not just a new bus, it is not just signal priority, but it is leading in some cases to 30 to 50 percent improvement in the speed and reliability and the ability to attract a whole new set of clientele.

Chairman SHELBY. Ms. Hecker, if you have a signal priority, some sensor on the bus working the signals or whatever, and you have an HOV lane or a bus lane, that is going to move traffic. I mean, just getting on the bus, that might be comfortable, but people like to go from Point A to Point B, don't they, as quickly as they can, unimpeded? So the question is if you can keep the buses from getting bogged down in the traffic that we run in every day, that

is what I was getting at. If you are going to call it Bus Rapid Transit, is it really that? Or is it just an incremental improvement?

Ms. HECKER. Well, I think that is precisely what the New Starts evaluation process would provide. A comprehensive set of indicators is built into the system.

Chairman SHELBY. Okay.

Ms. HECKER. A quick review of the nature of Federal support, the New Starts program. There is only one BRT system currently in operation that has a grant agreement. That is in Boston. That is out of 26 that have agreements.

On the other hand, there are six projects in earlier stages of development out of 200 New Starts projects. So it is not a big universe right now. Part of that, of course, is the fact that there is this restriction on the fixed guideway. But it is also that there is tremendous competition, as you know, for New Starts.

The other categories—and there are projects that have used them—are the urban formula grants and the bus discretionary programs. These tend to be smaller, also very competitive. They are not the major kind of capital improvements that you see in the New Starts program. In addition, projects can use both STP and CMAQ funds.

Something unique that I might bring to the table is a new innovation really on the wings of what they call HOT lanes, or high-occupancy toll lanes. This involves converting underutilized HOV lanes around the country, and combining that with cross-subsidy investments from the tolls in these new lanes, new improved lanes, and subsidizing Bus Rapid Transit. This is already the case in the San Diego region. There are a number of projects in this area around the country. What is interesting about that, is that is it is really multimodal. It is improving the commute and the efficiency on the highway. It is generating revenue, and it is cross-subsidizing and at the same time improving the transit options and providing revenue for that.

The BRT demonstration project is not a source of funding for a project. It has basically been a good opportunity for exchange of information. So there have been limited resources available.

One of the factors that communities consider is cost. Our report talked about the fact that very often Bus Rapid Transit had a lower cost than light rail, but not necessarily. It is a function of the nature of the right-of-way, whether they are purchasing a right-of-way, whether it includes a tunnel. So it is not an absolute that there is always going to be a cost advantage, and that is why it is wise that there is no mandate, but it is a tool that belongs in consideration. Performance is another key factor as is flexibility.

The bottom line that we have is that BRT is a viable option. It has worked in many regions, a number in this country but more significantly around the world. It belongs on the table, and there is merit in not having it be disadvantaged in the criteria. Federal policy, I would agree with you, should be mode-neutral, and I would be happy to take any questions.

Chairman SHELBY. Thank you.

Mr. Brosch.

**STATEMENT OF GARY L. BROSCH**
**CHAIRMAN, NATIONAL BUS RAPID TRANSIT INSTITUTE**
**CENTER FOR URBAN TRANSIT RESEARCH**
**UNIVERSITY OF SOUTH FLORIDA AND THE**
**INSTITUTE OF TRANSPORTATION STUDIES AT**
**THE UNIVERSITY OF CALIFORNIA, BERKELEY**

Mr. BROSCH. Good morning, Mr. Chairman and Members of the Committee. I am here today as Chairman of the National Bus Rapid Transit Institute, a collaborative effort at the University of South Florida and the University of California, Berkeley. With me today are Dennis Hinebaugh, our Director, and Senior Researcher Michael Baltes. The National Bus Rapid Transit Institute was established in 2001. We are proud to be a pioneer in this area. We have current activities doing evaluation of BRT projects, developing the peer-to-peer technology transfer program. We publish the *BRT Quarterly*, and we have the *nbrti.org* website. I encourage you to visit it.

Let me tell you a few lessons we have learned about BRT. The first, of course, is the difficulty in developing consensus on the definition of BRT. We agree that a flexible definition is what is most important to allow the communities to define the systems that work best in that community, not necessarily those that would just qualify for Federal funding.

Another lessons we have learned is that auto dominated Los Angeles has debunked the old myth that people will ride trains but not buses. That was based on a paradigm of trains being clean and fast and buses being dirty and slow. BRT has changed that paradigm. Fast, frequent, convenient service is what is key.

A surprising and important lesson we have learned is that nontransit users like BRT. They like it because it is perceived as cost-effective and highly utilized. Their tax dollars are being used wisely. They are getting 80 percent of the benefits of light rail, only 20 percent of the cost. It takes the support of these nonusers——

Chairman SHELBY. Say that again?

Mr. BROSCH. They get 80 percent of the benefits of light-rail systems at only 20 percent of the cost or, as the GAO report has shown, sometimes even less.

We have also found around the world, and we are starting to find in the United States that BRT does have an effect on land use, just like light rail does. It takes the support of these nontransit users, as well as the users to get local funding commitments that make BRT such winning opportunities for communities.

To tell you a little bit about the future role of BRT, you know, certainly from the creation of the interstate system, the current TEA–21, Congress has had a great deal to do with shaping our transportation future. And we think the potential of BRT is so compelling that it deserves the serious consideration you are giving it.

A couple of things you could do. Certainly in the area of research and technical assistance, market research, we need a lot more. There is peer-to-peer assistance. We need to do more in debunking that current myth that only light rail can affect land use.

The evaluation of systems. Make no mistake. We love BRT systems, but we want it to be tough love and look only at those that are cost-effective.

We also think that the current consortium member program should be expanded. There are more cities that would like to join those 19 that are currently receiving funding.

And, of course, the big dog, the method of Federal funding, how do you do it? You have talked about several different types. I encourage you to look at the strengths and weaknesses of each opportunity, avoid some unintended consequences of the selected option. If you include BRT in the bus program, you might use up the funds that are needed for routine replacement. If you put it in the New Starts program as currently proposed, the devil is going to be in the details that you are asking, the details of what are the evaluation criteria, how do we ensure cost-effectiveness, how do we ensure they are neither too big nor too small. How do we do that?

In conclusion, we think BRT is an idea whose time has come. We encourage the Members of this Committee to continue to exert the leadership that Congress does in shaping our transportation system. We want to support local decisions, help the locals understand the tremendous advantages they can achieve through BRT. We want to roll up our sleeves and help you, Mr. Chairman and Members of the Committee, and we thank you very much for allowing us to present.

Chairman SHELBY. Mr. Hamm.

**STATEMENT OF KENNETH P. HAMM**
**GENERAL MANAGER, LANE TRANSIT DISTRICT**
**EUGENE, OREGON**

Mr. HAMM. Thank you, Mr. Chairman, for the opportunity to come before the Committee today and share a little bit of Eugene, Oregon, and the Lane Transit District's Bus Rapid Transit project with you.

The Lane Transit District, for those that do not know, is serving the Eugene-Springfield area. The urban area's population is about 230,000, located about 110 miles south of Portland. It is the home of the University of Oregon and what we call the Mighty Ducks.

Alternative modes of transportation are popular there, and Lane Transit District carries about 6 million boardings annually. Lane Transit District has a reputation for innovation in our industry. In 1985, our entire fleet became accessible with wheelchair lifts on all vehicles. In the late 1980's, we also constituted a pass program with the University of Oregon student body whereby all students could use their student ID passes to ride the bus. It became a model for other university cities. We are one of the first transit systems to have bicycles on all our buses.

Eight years ago, we were looking for a new way to enhance transit services. We did a rail study, and the community concluded that the Eugene-Springfield area was too small for light rail or any other rail application. And Bus Rapid Transit was adopted as a strategy for achieving our goals. Light rail at that time was projected somewhere in the $30 to $60 million per mile range, and the BRT application that LTD was looking at was projected to be somewhere in the $3-million to $5-million-per-mile cost.

We took the idea to the community, the city councils, the county commission, and our Congressional delegation, and the first phase was funded through TEA–21 in the discretionary funding category.

There is tremendous community interest in this service, and the two cities have already approved two additional corridors, including connecting a new regional medical center, retail, and light industrial centers.

Bus rapid transit has become one of the cornerstones for the 20-year transportation plan in our area.

We see in this picture a vision for our community. We believe that it is the foundation for solutions to the congestion that is projected in major corridors in the Eugene-Springfield area. We also believe that Bus Rapid Transit needs to mirror light rail to achieve the kind of performance improvements that light rail has. But we believe that Bus Rapid Transit—and in Eugene it will be true—should have the following elements: A fixed guideway or exclusive right-of-way; priority at intersections; improved passenger boarding facilities, not just bus stops, stations; limited stops, in other words, spaced out to major transportation generators, but at intervals that make sense and move buses along; prepaid fares collected off-board; at-grade boarding platforms so that there is accessibility for anything that walks or rolls; real-time information; coordination with land-use planning; and unique vehicles.

Phase 1 of our BRT project is 4 miles long. It connects the two downtowns between Eugene and Springfield. This corridor is our most heavily traveled as it has the University of Oregon and a major regional medical center along it. Phase 1 is 60-percent exclusive right-of-way. The other 40 percent, as they redesign part of one of the cities, will come along in the future.

How to move forward? Congress is where we believe we need to start. We have been working with our local delegation. I am here today to make a number of appeals to this Committee and to the Congress as a whole.

First, we would like to see that there is stable, predictable, and guaranteed funding for highways and mass transit. We ask that you make no reductions to the current Federal transit formula calculations. We ask that you do not eliminate the discretionary bus funds. We believe that small systems and rural systems have effectively invested those funds in their communities, and larger systems have also funded projects using the flexibility there.

We would like to have a category called Small Starts as proposed in the Administration's proposal, but we believe that the cap on that should be $75 million total project cost. The concern there is that large urban projects that have significant local funding to match at higher levels will squeeze out smaller rural and urban systems.

We would like to see the requirements for Small Starts streamlined. Six or more years of processing puts a heavy burden on small systems that do not have that kind of money or staff.

We would also like to see the 80-percent/20-percent local match preserved. So, we ask you to please grow the program.

Finally, one last challenge. I ask that Congress participate with the transit systems and the transit manufacturing industry to find a way to produce innovative vehicles that meet the demand and re-

quirements that have been communicated to them by the systems that are considering Bus Rapid Transit.

Thank you for the opportunity to come before you today.

Chairman SHELBY. We thank you, Mr. Hamm.

We are going to suspend the hearing. We have a vote on the floor of the Senate, and as soon as we get back, we will reconvene.

The Committee is in recess.

[Recess.]

Chairman SHELBY. The Committee will come back to order.

Mr. Diaz, your written testimony will be made part of the record, along with the others. We welcome you to the Senate. We know you have come a long way.

**STATEMENT OF OSCAR EDMUNDO DIAZ**
**ENRIQUE PEÑALOSA'S ASSISTANT AT NEW YORK UNIVERSITY**
**ADMINISTRATIVE DIRECTOR AT THE INSTITUTE**
**FOR TRANSPORTATION AND DEVELOPMENT POLICY**

Mr. DIAZ. Thank you. Mr. Chairman and Members of the Committee, my name is Oscar Edmundo Diaz. I am the Administrative Director of the Institute for Transportation and Development Policy in New York and the Assistant to Enrique Peñalosa, former Mayor of Bogotá. I thank you for the opportunity to testify today about Bus Rapid Transit.

Bogotá is a 7 million inhabitant city where growing car use has hurt the quality of life. Our chaotic transportation system was bad for the city, passengers, drivers, and bus owners. In 3 years, starting in 1998, Mayor Enrique Peñalosa created from scratch a BRT system called TransMilenio that transformed the quality of life in our city and helped renew our civic spirit.

Mayor Peñalosa decided in 1998 to reject a Transportation Master Plan that proposed to solve Bogotá's traffic jams with a metro system and elevated highways because it was unaffordable and unworkable, promising mobility for the few, not mobility for all. We saw that for the cost of one subway lane, we could provide quality bus rapid transport to the whole city. We would have money left for sewage, schools, and parks. TransMilenio cost $5 million per kilometer compared to the $66 million per kilometer cost of the Washington Metro.

Chairman SHELBY. Say that again.

Mr. DIAZ. $5 million per kilometer compared to $66 million per kilometer of the Washington Metro, although Bogotá's system carries nearly twice the number of people per day on a system one-fourth as long as the Washington Metro.

With the money that Bogotá would have paid in 1 year of interest for a loan to build the metro, Mayor Peñalosa built 155 miles of bicycle paths that now move 5 percent of the population, up 10 times from the ridership we found in 1998. A key to the success of Bogotá's BRT is the attention paid to improving public spaces, bikeways, and sidewalks which make the system safe and accessible to all.

BRT is more than just priority for buses in traffic or exclusive bus lanes. The true BRT demands attention to the needs of riders as they get to and from the transit system, with bicycle parking

garages and safe routes to schools and transit for pedestrians and bicycles.

In TransMilenio, two or four central lanes in main traffic arteries are set aside exclusively for buses. Articulated 165-passenger high-platform buses stop at stations and open their doors simultaneously with station doors, as you can see in the poster that we have attached.

Since passengers have already paid, a hundred passengers can board in seconds, like a metro, and with handicapped access.

One ticket permits one passenger to change from feeder buses to local or express buses. The cost, regardless of the trip length, is 36 cents per trip.

TransMilenio is a nonsubsidized system, wherein all operating costs are recovered through the fares collected, except for the road infrastructure. It is considered evident that since the government pays for the road infrastructure for private cars, it must pay for roads used for public transportation as well.

As a public-private partnership, private contractors work in concert with TransMilenio which manages the bidding and controls operations but receives only 4 percent of the system's income. The contractors who operate buses and collect fares share the income. We are expanding the system, and by the year 2016, more than 80 percent of Bogotá's residents will live within 500 meters of TransMilenio.

TransMilenio has cut traffic fatalities by 89 percent, noise by 30 percent. The biggest story is TransMilenio's effect on how people think about transit. A deputy mayor who had often given his assistant a ride was recently surprised when he declined a ride saying, "Sorry, but I am in a rush. TransMilenio is faster." In fact, most users have cut their travel times by a third, saving 300 hours a year on average Thirty-seven percent of users report they now spend more time with their families. For Senator Miller who asked before, 11 percent of current TransMilenio riders are car owners.

The Bogotá BRT model is neither technologically sophisticated nor economically demanding, although it requires political decisions aimed at truly making the public good prevail to ensure access for all.

As you reauthorize TEA–21, I encourage you to ensure a doubling of funding for public transportation to expand travel choices around the United States. I encourage you to ensure a level playing field for transit and highway New Starts, with parity in the Federal funding match. I encourage you to support the use of New Starts program funding for high-effectiveness BRT systems that are designed, like Bogotá's system, to operate and feel like rubber-tired metros. It would be imprudent to divert New Starts funds to low-grade bus system elements, such as support for high-occupancy toll lanes offering infrequent bus service, lacking dedication of toll revenues for transit operating costs, and lacking ongoing attention to system access, equity, and environmental impacts.

I thank you again and I will be pleased to answer any questions you might have.

Chairman SHELBY. Thank you very much.

Ms. Canby.

**STATEMENT OF ANNE CANBY**
**PRESIDENT, SURFACE TRANSPORTATION POLICY PROJECT**

Ms. CANBY. Thank you very much, Mr. Chairman and Members of the Committee. My name is Anne Canby, and I am President of the Surface Transportation Policy Project, and I am very pleased to be here this morning to discuss Bus Rapid Transit and other bus service innovations.

The Surface Transportation Policy Project is a nationwide organization of over 600 organizations, including advocates for transit, pedestrians, bicycles, environment, social equity, public health, and growth management. All are devoted to promoting balance in the Nation's transportation system.

Mr. Chairman and Members of the Committee, we thank you for your strong commitment to public transportation. Many of my colleagues and I believe that this will be the transit century.

The record shows that public transit has been both a popular and a good investment. The TEA–21 funding guarantees and the stability this provides have made a huge difference. We believe that it is both appropriate and timely for this Committee to consider ways to help stimulate transit providers to invest in Bus Rapid Transit and enhanced bus services. In my written testimony, I have provided several recommendations to help make this happen.

First, the current program structure should be kept, with some simple adjustments to the current law to support a broader BRT agenda, as well as enhanced bus services, as Mr. Hamm noted.

The STPP recommends retaining the New Starts program and continuing its focus on fixed guideway projects, including BRT, as well as the various rail technologies.

Next, we believe that the bus discretionary program should be continued with modifications to allow for multiyear grant commitments for enhanced bus service projects that fall outside the criteria of the New Starts program. These commitments could be provided for bus projects that meet a certain threshold criteria. The Federal Transit Administration should have a process to help you in the Congress determine which bus discretionary projects are appropriate for multiyear grant committees. The FTA could also build their recommendations to Congress based on some criteria that you establish in the bill, and these would be in addition to those included in my written statement, things such as projected time savings, service frequency, the percent of dedicated right-of-way, the utilization of intelligent transportation technology, and supportive land-use requirements.

Critical factors for the success of high-capacity transit services, including BRT, are supportive land-use requirements, particularly for station areas, a distinctive product, high service frequency, and a sense of permanence. These are especially important, I believe, in the case of BRT because of the need to overcome the stigma toward the bus in many communities, particularly among developers and the broader development community.

Mr. Chairman, our recommendations follow the basic view of the STPP that the TEA–21 law is fundamentally sound. We should stay the course, with some adjustments. Let me note those briefly.

Some that are of overriding concern to us include: Retaining the 80 percent Federal, 20 percent local matching ratio for New Starts,

a major achievement of ISTEA that should not be rolled back; and continuing the guaranteed funding features of TEA–21, again, crucial to increasing investment in public transit and continuing the success all over our country.

We are quite disturbed by the Administration's proposal to leave the New Starts program outside of the budgetary firewalls, and we are even more alarmed at the discussions taking place that would shift most of the dedicated fuel taxes in the mass transit account to highways, replacing a certain revenue stream with uncertain proceeds from a bonding program. And we applaud your leadership with your Members in opposing this proposal that would take transit in the wrong direction. Thank you.

Expanding bus services relies on building a strong partnership among Government agencies, transit agencies who provide the services, and those other agencies that tend to own the roadway network. Expanding the current authority, as others have spoken to this morning, of local decisionmakers over Federal transportation funds, we think, would foster transit-supported land use and transportation decisionmaking. And effective transit services, it is important to note, require supportive land-use policies and patterns to integrate development with those services. Expanding local authority would also foster providing a good pedestrian environment around transit stations and stops.

The STPP believes that the integration of land use in transit and roadway development is best addressed at the regional level.

Stimulating greater private sector engagement is an important consideration in making BRT and enhanced bus services more viable. Investors and developers need to have a sense that the transit service is permanent, that the service is a distinct product, and that high-density, mixed-use, transit-oriented development will be permitted along transit corridors.

In closing, let me just thank you for the opportunity to address you this morning.

Chairman SHELBY. Ms. Canby, thank you, and also you will note the Senator from Delaware here.

Ms. CANBY. Indeed.

Chairman SHELBY. I think you worked with him closely in his Administration when he was Governor. Is that correct?

Ms. CANBY. That is very true.

Chairman SHELBY. Senator Carper.

**COMMENTS OF SENATOR THOMAS CARPER**

Senator CARPER. Thank you, Mr Chairman, and thank you for holding this very important hearing. I worked for Anne for 8 years.

[Laughter.]

One of the best bosses I have ever had. It was a privilege.

Ms. CANBY. Thank you, Senator.

Chairman SHELBY. Ms. Hecker, the GAO report which you were involved in indicates that Bus Rapid Transit can be a very cost-effective alternative which urbanized areas should consider. On the other hand, I am sure that there are situations—and you have alluded to this, and others have—in which BRT would work much better than in others. What are the conditions where it is likely that BRT will work the best?

Ms. HECKER. Well, one of the conditions is that there is an appropriate right-of-way, so that you have either the opportunity to have the fixed guideway or a dedicated arterial lane, but there is not the same opportunity or it would be more expensive to try to have either an underground subway or other more comprehensive solutions.

So, the key really is, though, that it is a unique case-by-case analysis of the topography, of the density of the population, so——

Chairman SHELBY. You just have to evaluate it.

Ms. HECKER. That is right, and I think that is why that idea of not prejudicing the evaluation is key, that it really has to be case-by-case. And in some cases, part of a corridor will be BRT on arterial street and part of it will be dedicated right-of-way. So there is lots of variation even within the same corridor. It is not that there is one pure solution.

Chairman SHELBY. Can you provide more detail, either now or for the record, about the cost comparison between light rail and BRT options?

Ms. HECKER. In our study, we evaluated 20 BRT projects, and basically we felt you had to categorize the cost of them by the different types of system, because they varied quite a bit. The busways basically averaged about $13 million per mile. The upgrading or conversion of HOV lanes cost about $9 million per mile. The improvement of the arterials averaged about $700,000. These compared with 18 light-rail systems that we looked at, and they averaged $34 million. So even the most expensive, the busway, which averages $13 million, was nearly a third of the average cost of the light rail.

On the other hand, we actually had some outliers where the light rail was cheaper than the most expensive BRT options.

Chairman SHELBY. You just have to weigh it, don't you?

Ms. HECKER. Precisely.

Chairman SHELBY. As we have heard earlier, the Bush Administration is proposing to expand eligibility of the New Starts program to include nonfixed guideway projects in order to help support Bus Rapid Transit. Is that a workable proposal?

Ms. HECKER. We do not have——

Chairman SHELBY. Is it better to fund such projects through the bus program?

Ms. HECKER. We do not have a firm position on that, and I think Ms. Canby actually put out a different options to facilitate more financing for nonfixed guideway. But basically right now the nonfixed guideways really are prejudiced. The urban formula grant and the bus discretionary program do not have the characteristics of reliable, multiyear funding, and basically they are at a competitive disadvantage. As it is today, it may disadvantage a lower cost ideal option that would be eligible for New Starts funding.

Chairman SHELBY. So, Mr. Brosch, how do you pronounce your name?

Mr. BROSCH. It is Brosch, by gosh. Thank you, Senator.

Chairman SHELBY. That is good. You suggest that a flexible approach is the best way to try to define, which we have been talking about here today, Bus Rapid Transit. In addition, you indicate that there are three approaches which could be used to help support the

BRT projects: Expanding New Starts, expanding the bus program, or establishing a separate BRT program.

Which is the best approach?

Mr. BROSCH. I wish I knew, Senator. I have to tell you, quite candidly, each of them has some strengths and each has some weaknesses. What we would like to do, as I can tell your members are wanting to do, is to make sure that as we make those choices that we are making the proper trade-offs; that if, in fact, we create a new program—which is a great idea to stimulate this good thing of BRT, without competing against LRT—that we do not inadvertently create a program where people just go for that pot of money because it is there.

If we put it in New Starts, as the Administration would have us do, we certainly have to wrestle with these issues of definition. We have to make sure that the criteria for evaluating them is appropriate for the size.

Chairman SHELBY. Well, so what do you mean by unintended consequences?

Mr. BROSCH. An unintended consequence would be if you put it in the bus program, did not change the size of the bus program, and now instead of agencies focusing on the important routine replacement of buses, they go after the more attractive, get this new system and let the old system deteriorate. That would be an unintended consequence.

Chairman SHELBY. Senator Sarbanes.

Senator SARBANES. Thank you very much, Mr. Chairman. This has been a very interesting panel.

Ms. Hecker, did you direct this GAO study? Were you involved in it?

Ms. HECKER. Yes, sir.

Senator SARBANES. I want to ask a few questions about its methodology, if I might, because it is obviously important as you do these comparisons.

On the capital cost comparisons, did you spread the capital cost of construction over the useful life of the assets?

Ms. HECKER. We were certainly working to make it comparable in the cases, and in every case we worked to get a consistent allocation of costs, particularly relative to light rail. We basically had case studies that included both Bus Rapid Transit and light rail in each city, so we were working with a common community and, therefore, had more likelihood of getting comparable data.

Senator SARBANES. Well, I would like to check into that further. Let me just as a hypothetical, without necessarily accepting that response, because I have been led to believe differently. But since light-rail cars and tracks have a longer useful life than BRT vehicles, that should be factored into the comparison, should it not?

Ms. HECKER. There definitely may be variations and opportunities for improvements, and we would clearly be happy to supply for the record the acknowledged limitations that may exist in the cost studies. A bus is not comparable to a light-rail vehicle in terms of the useful life. So, you are right about that.

Senator SARBANES. My question is: When you compare the cost of the two modes, shouldn't you spread the capital costs of construction over the useful life of the assets?

Ms. HECKER. That seems to be a viable approach, and if we did not, I think that was a limitation——

Senator SARBANES. Let me strike the word "viable." It seems to me to be the appropriate approach if you are going to have an apples-to-apples comparison, is it not?

Ms. HECKER. You are right, ideally you have life-cycle costing in major transportation investments. There is no doubt that that is the preferred way to do the analysis.

On the other hand, to keep the information comparable and to have it be the way the local community actually built the system, we worked to identify the actual construction costs.

Senator SARBANES. You mean you did not have a parameter of comparing in which you factored this in?

Ms. HECKER. We basically tried to book capital costs——

Senator SARBANES. You were just telling the Chairman you have to evaluate each situation and look at it carefully, but on what basis do you evaluate it? It seems to me, what is the most fundamental question in these comparisons, that you should take into account is the useful life of the assets. Isn't that correct?

Ms. HECKER. That clearly has merit and is an important part of good analysis of major transportation investments.

Senator SARBANES. Well, you better let me know whether that is what you did or not. Okay.

Ms. HECKER. I would be happy to clarify for the record.

Senator SARBANES. All right. Now, let me ask you about the operating costs. You compared operating costs per passenger trip for light rail and Bus Rapid Transit.

Ms. HECKER. That is correct.

Senator SARBANES. And you found that in Dallas light-rail operations cost $2.68 per passenger trip while BRT cost 31 cents. Is that correct?

Ms. HECKER. I am not familiar with that number. The general observation was that no one approach had an advantage over the other. I do not recall what those numbers represented. Our overall conclusion on operating cost was that neither BRT nor light rail had a consistent advantage over the other one.

Senator SARBANES. Well, I refer you to page 24 of the GAO study, Figure 9. Do you have it there?

Ms. HECKER. I do.

Senator SARBANES. Operating cost per unlinked passenger trip, 1999, Dallas——

Ms. HECKER. Right, and——

Senator SARBANES. —$2.68 light rail, 31 cents plus rapid transit. Is this correct?

Ms. HECKER. Right. That is in Dallas. And then you see we have five other cities——

Senator SARBANES. I just want to focus on Dallas for a moment.

Ms. HECKER. Okay.

Senator SARBANES. So, the figures that I gave you about Dallas were correct.

Ms. HECKER. For Dallas.

Senator SARBANES. Is that right?

Ms. HECKER. Correct.

Senator SARBANES. All right. Now, I understand that in Dallas the BRT vehicles run on an HOV lane. Is that correct? High-occupancy vehicle lane?

Ms. HECKER. I understand there are anomalies in what is called transit in Dallas, and there are bona fide open issues about what goes into that data. So there are anomalies in different cases.

Senator SARBANES. Let me just stay with the Dallas thing.

Ms. HECKER. Okay.

Senator SARBANES. This HOV lane carries automobiles which have more than two or three people in carpools. Is that correct?

Ms. HECKER. That is correct. I do not know whether it is two or three there.

Senator SARBANES. I understand you included the passenger trips made by the carpools in the equation of what was being carried by the BRT system. Is that correct?

Ms. HECKER. As I said before, we worked to get this comparable—particularly to gather this data with each local area, and we agree that it was anomalous the way Dallas did, in fact, define, as you have specified, multipassenger vehicles as transit. And I think that is a stretch, and I think you are quite correct.

Senator SARBANES. So the 31-cent-per-passenger cost here is not just the passengers on the BRT. It is all the passengers in the HOV automobiles. Isn't that correct?

Ms. HECKER. I believe so.

Senator SARBANES. What kind of comparison is that? I mean, with all due respect.

Ms. HECKER. Well, this data was not available for anyone in doing this report, this was the first time there was an overall attempt to compare not just the capital costs but the operating costs. It is clarified in our methodology that there were limitations in this. But even the overview of that table supported the observation that there is not a consistent advantage for one mode over the other. And basically we think while there are limitations in the data, it supported the general observation that no——

Senator SARBANES. But you are not going to get off the hook that easy by saying, look, this is in the context of other things. I am trying to get at your methodology. These are tough decisions, and, you know, we have to analyze them pretty carefully, and I have serious doubts about your methodology here. In Dallas, at least, you are including people driving private vehicles as passengers for a Bus Rapid Transit system and making your comparison of per passenger cost on that basis.

Ms. HECKER. You can see it is an outlier with all the other BRT. It is not in the same ballpark of the ones that are $1, $1.06——

Senator SARBANES. Well, I have not looked at those. I mean, I do not know whether if we took a look at those we would find faults in the methodology as well. But the only point I am going at is you have included here in your chart this methodology of cost per passenger comparing BRT and light rail. And in the Dallas case, at least, you are including as passengers for the cost of the BRT people in private automobiles making use of the HOV lanes.

That does not strike me as an appropriate concept to be using in making these comparisons. That is the point, very simply put. I do not know how you defend that.

Now, you can try to divert attention by pointing to the other columns there, but how do you defend it in that instance?

Ms. HECKER. It is data that does not exist, and the best that we could do. Because the operating costs were not broken out by different types of vehicles, we had to report the way the data was available and collected at the local area.

Senator SARBANES. The only data you had was all of the people who rode in the HOV lanes, bus and automobiles. Is that right?

Ms. HECKER. The way the transit authority collected the data and the only way they could make operating data available included their extremely generous and expansive definition of Bus Rapid Transit.

Senator SARBANES. All right. Let me ask—I am sorry. How much time do I have? Have I used up my time?

Chairman SHELBY. You go ahead, Senator.

Senator SARBANES. I want anyone on the panel who wants to answer this. What is the economic development benefits that come with Bus Rapid Transit as opposed to fixed rail, either metro or light rail? Ms. Canby, why don't you take a shot at that to begin?

Ms. CANBY. Senator, I will give it a shot. Based on my experience in working with some developers, I think it is pretty clear that, at this point, the economic impact of Bus Rapid Transit is going to be less than a fixed guideway rail investment because the development community tends not to view or really pay attention to bus transit services. Salt Lake City is a good example. A developer out there indicated to me that before the light-rail line was built, they had no interest in building near transit. And now that the light rail is in, they are all clambering all over each other to get near transit.

So there is a very different pull, and I mentioned in my statement the stigma of the bus. In the development community, it is a very strong impedient, I would say, to attracting development around transit. Pittsburgh has overcome some of that, but I still think it is a major issue.

Senator SARBANES. Should the economic benefits that would result from the transit project be factored into the equation in evaluating what systems you want to use? Is it an appropriate item to be included even though it is external to the transit system itself?

Ms. CANBY. I would think, yes, very much that the economic development potential should be included as a factor in any major transit investment because it will have a huge influence over the level for ridership.

Senator SARBANES. Does someone else want to add anything? Yes, Mr. Hamm?

Mr. HAMM. Senator Sarbanes, I wanted to add that one of the considerations in our community around the development of this application was the debate about permanence in the corridor. What we heard from developers is that typical fixed-route transit applications are portable. They can be moved depending on how communities react to them.

In these corridors, because they are permanent corridors and because we are looking for permanent solutions, the investment in our case in a fixed guideway for the transit system tells the development community that we are making a permanent, long-term commitment to that corridor solution. And I think it has the poten-

tial, while I do not have any hard data because it will be a while before we are on the ground, but we believe it has the potential to drive joint development. We have had inquiries from developers already along that corridor, as well as the potential to have an economic benefit in terms of connecting some of the nodal pieces throughout our two-city community.

Senator SARBANES. Your system is primarily fixed guideways, is it not?

Mr. HAMM. Correct.

Senator SARBANES. Well, I understand that. I think when you have fixed guideways, you can probably get pretty direct comparisons. It is this nonfixed guideways which seems to me to raise a lot of very important questions.

Mr. Diaz, did you want to add something?

Mr. DIAZ. Yes, I just would like to share our Bogotá experience. Normally, the cost of kilometer of a BRT system is around $3 to $4 million.

Senator SARBANES. Are you primarily fixed guideways in Bogotá as well?

Mr. DIAZ. They are like this, isolated corridors, exclusive corridors for buses.

Senator SARBANES. Only buses.

Mr. DIAZ. Yes, only buses. We do not mix them with private traffic. We also use feeder buses, which take people from the outskirts to the TransMilenio lanes. But they are isolated.

Senator SARBANES. So, you run the buses down that lane just like you would run a subway——

Mr. DIAZ. A subway.

Senator SARBANES. —car down a track, right?

Mr. DIAZ. It is like a surface subway.

Senator SARBANES. Well, can anyone get at that lane other than your buses?

Mr. DIAZ. No, no—well, ambulances, for example, if there is an accident or something. But no cars, not even the diplomatics or the government cars, can use them.

[Laughter.]

Senator SARBANES. You really do restrict them, don't you?

[Laughter.]

Mr. DIAZ. We have to.

Anyway, what I wanted to say is that in our case we invest more money building the corridors because we invest a lot of money in public spaces and sidewalks along the BRT system and perpendicular. That has improved a lot of the area around the BRT system, and that has become a renewal, an urban renewal for the city.

Another very interesting thing about the new developments, besides that, is that our buses are more labor-intensive than metros. Not so many countries make metros. I mean, the trains themselves. But the buses you can build them. For Phase 1 in Bogotá, we had to import them because we imported a lot of buses at the same time from Brazil. Now, for Phase 2, we are assembling the buses in Colombia, so we are generating more jobs in Colombia. And that is very important.

I have to explain something very quickly. In our system, TransMilenio is the local agency, but the operation is done by pri-

vate contractors. So the buses that you see there, the red buses, are operated by private contractors so we do not buy the buses. They are bought, purchased by private operators.

When they were going to implement the system, nobody wanted to lend them money. They were unable to access loans in Colombia. So they had to access a loan in Brazil, a loan that would allow them to export the buses to Colombia. But for Phase 2, now the loan is given in Colombia with the same rates and benefits that they had before. So now that the system is working, there is also a new improvement in the other factors that play in the system, like the loans, like the buses being built in Colombia.

I think it is a whole improvement also in the urban renewal, as I said.

Senator SARBANES. Thank you.

Chairman SHELBY. Mr. Hamm, in your testimony I think that you talked about this. The design and construction cost is currently estimated at $16 million or $4 million per mile. This is about 10 percent of the cost of a moderately priced light-rail line—your words. That is a significant difference, and I think you have to look, as people have said here, at each special deal. Did you consider in your alternative analysis light rail, as an option?

Mr. HAMM. There was a rail study done by the community in the preliminary discussions around the enhancement of public transportation in the development of the 20-year transportation plan. And when the community looked at the cost, they believed that that investment was not appropriate for a community the size of the Eugene-Springfield area.

Chairman SHELBY. You also note in your testimony that you had difficulty choosing a vehicle for your service because of the lack of availability of American vehicle manufacturers providing rail-like BRT vehicles. You suggest that our reauthorization bill should contain funding or incentives for American manufacturers to break into this market.

What do you have in mind here? It looks like the market would work here. If there is a demand, somebody would supply it if the demand was sufficient.

Mr. HAMM. That loggerhead may be changing, Mr. Chairman, but the reality is that because most of the larger transit systems in the United States purchase the largest number of vehicles, as Bus Rapid Transit has emerged, some of the technologies that are, I think, critical to an effective BRT application haven't been incorporated in vehicles here, things like guidance systems for precision docking in particular.

Chairman SHELBY. Why haven't they, though?

Mr. HAMM. The manufacturers just have not gone there. They have been stubborn about we have our corner of the market and we are——

Chairman SHELBY. Okay.

Mr. HAMM. You know, I think part of it is the substantial—I talked to one manufacturer recently. It was somewhere between $14 and $16 million to redevelop a vehicle around this market, including retooling and a number of other engineering costs.

Chairman SHELBY. But if there is enough demand, somebody will, if there is competition.

Mr. HAMM. I think it will come. But probably being out on the leading edge, we have been a little more frustrated than others.

Chairman SHELBY. Okay. Mr. Diaz, your project sounds like a great success from what you have said. How is it funded? I thought you said that it paid for itself. It is not operationally subsidized, is that correct? Do you subsidize the operations of it?

Mr. DIAZ. No, no. It is a nonsubsidized system.

Chairman SHELBY. How are your operational costs covered?

Mr. DIAZ. Okay. This is the way it works: All the infrastructure, like the corridors and the stations, are built by the city. And the money that we used to——

Chairman SHELBY. Infrastructure costs are provided by the city.

Mr. DIAZ. Yes, it is provided by the city, and the money that we use to build those corridors comes from a tax, a gasoline tax. That is 25 percent, and from that 25 percent, we take 15 percent that goes directly to the construction of the corridors.

Then the operation, as I said, the ticket is 36 cents per passenger, and all of that money goes to a trust fund. That trust fund receives 0.4 percent to manage the money. Then the bus operators, there is a formula, but basically it is per bus kilometer. The bus operators are private companies and are paid up to 65 percent. So let's say for $1 that the system receives, 65 cents goes to the bus operation based on the bus kilometer they run. Then the ticketing, so that the people that collect the money, they receive 11 percent based on the tickets they sell. The other part goes to the feeder buses. They receive 20 percent from this share, up to 20 percent based on passengers they move.

So that this is the way the system distributes the income and all costs are covered. This is very important. The city does not have to pay a cent to pay all of the actors in the system. And also, TransMilenio is a very small entity. It only has 70 people working. And one of the functions that they have is to manage the system, control the system, and also be in charge of all the administration issues that the system requires.

Chairman SHELBY. How many passengers a day does your system carry?

Mr. DIAZ. 792,000 in 41 kilometers.

Chairman SHELBY. That is a lot of people.

Mr. DIAZ. Yes, and in one of the most congested corridors, we move 35,000 people in peak hour per hour per direction, and that is very high. And, in fact, it is higher than, for example, the most congested line in the metro in Madrid. So it is comparable in capacity. That is one of the normal questions that you have when you are promoting BRT systems, the capacity, because you normally can move more people in the metro system. But it turns out that in Bogotá, TransMilenio is moving more people per hour per direction than a metro like Madrid. Sometimes it is not just a matter to say that BRT moves less people.

Senator SARBANES. What are the alternatives for your users in terms of transportation to the BRT?

Mr. DIAZ. Well, of course, we still have some of the old chaotic system in other corridors, which is—I mean, it is still a mess.

Senator SARBANES. What percent of the people using the BRT have a private automobile?

Mr. DIAZ. Eleven percent, which, by the way, was something that we were not expecting.

Senator SARBANES. So 89 percent of your passengers do not have a private automobile.

Mr. DIAZ. Exactly, and 11 percent have. And, in fact, we were not expecting that demand, so we had to increase the number of buses because we were not expecting—as I said in my statement, now it is faster to move using the TransMilenio than the private car. So, people realize that it is faster to move——

Senator SARBANES. I know, but most of your people are a captive clientele, aren't they? I mean, they have no alternative.

Mr. DIAZ. Well, of course, they have to use the other system. I mean TransMilenio is only 41 kilometers. By 2016, it is going to be 388 kilometers.

Senator SARBANES. But our problem is different. We have to get the people out of the car.

Mr. DIAZ. Yes, we also have to take them out of the car, and one of the measures——

Senator SARBANES. You say 89 percent of your users do not have an automobile. It is a different problem.

Mr. DIAZ. Oh, yes.

Chairman SHELBY. Did you take them out of the car or were they already out of the car before you built this?

Mr. DIAZ. They had the car and they used the car on a daily basis. But they left the car at home and decided to move in the TransMilenio system instead of the car. That is what I am saying.

Senator SARBANES. What percent did that?

Mr. DIAZ. That is the one I said, 11 percent. I mean, what I say is 11 percent of current TransMilenio riders, they have a car.

Senator SARBANES. Yes, 89 percent do not.

Mr. DIAZ. Do not, of the TransMilenio riders.

Senator SARBANES. Yes, well, that is the point.

Chairman SHELBY. That is the same point.

Mr. DIAZ. There is something else.

Chairman SHELBY. Go ahead.

Mr. DIAZ. The other thing that is very interesting is that we also built 155 kilometers of bicycle paths, and we are now moving 5 percent of the population on bicycles. When we arrived in 1998, only 0.4 percent of the population used the bike as a means of transportation. So it is very interesting to see how you can also use other means of transportation.

And we also need to take people out of the cars, and we use car restriction during peak hours. That also encourages people to take public transportation.

Chairman SHELBY. Ms. Canby, I have a couple of quick questions. You stated that you believe it is appropriate to continue the requirements for New Starts projects to include a fixed guideway component. You also suggest that a process be developed to include multiyear commitments from the bus discretionary program.

Doesn't the present limit on eligibility have the potential to bias local decisions toward projects which are eligible for funding even when a nonfixed guideway project might be the better choice? Do you understand what I am saying?

Ms. CANBY. Yes. Mr. Chairman, my recommendation is based on my experience with transit services and the market perception. I think the challenge is to find a way to allow both kinds of projects to move forward without the biases that may be inherent in the program today.

Chairman SHELBY. You have to evaluate the project, don't you?

Ms. CANBY. To evaluate it, and I think creating another outlet through the bus discretionary program may be a good way to allow a broader array of projects to move forward.

Chairman SHELBY. Is it really practical to include a process for multiyear commitments in the bus program, which typically supports a very large number of projects, with an average of only about $1 million per year per project?

Ms. CANBY. The way to overcome that, Mr. Chairman, would be more money.

Chairman SHELBY. I know.

[Laughter.]

Senator Sarbanes and I understand that.

Ms. CANBY. I know you do.

Chairman SHELBY. We would like to do that.

I want to thank the panel for coming and participating. We think this is very important for our record here on reauthorization. And we appreciate your patience when we were voting.

Thank you very much. The hearing is adjourned.

[Whereupon, at 12:36 p.m., the hearing was adjourned.]

[Prepared statements, response to written questions and additional material supplied for the record follow:]

## PREPARED STATEMENT OF SENATOR DEBBIE STABENOW

Mr. Chairman, thank you for holding this hearing on Bus Rapid Transit and innovative bus technologies. Ensuring safe and efficient public transportation is one of the most critical issues that we face as Members of this Committee.

I look forward to working with the Chairman, and all Members of this Committee, as we craft a strong mass transit title to the upcoming TEA–21 reauthorization this year.

There are bus systems operating in every one of Michigan's 83 counties, and I am extremely interested in technologies that can help these systems to run more safely and efficiently.

While transit discussions often focus on rail and subway systems, States like Michigan that do not have a major subway system also have tremendous mass transit needs.

Yesterday morning, I heard a piece on National Public Radio (NPR) about low wage workers. One person featured was Detroiter, Marzs Mata, who works for Comcast customer service in one of Detroit's suburbs, and commutes by bus from downtown Detroit.

It takes Marzs about five hours every day to get to and from work, an ordeal that involves taking three different buses. She doesn't have a car, and cannot afford to live near her job, making public transportation her only option.

Mass transit plays a critical role in Michigan's economy, not only by creating thousands of jobs, but by providing critical services for Michiganders who cannot afford to own a car.

For example, 78 percent of jobs in metro Detroit are 10 miles or more from downtown, more than twice the national average, making public transit critical for working families.

Unfortunately, Michigan's public transit needs have long outpaced the amount of Federal funding the state receives. Michigan currently ranks last in Federal transit funding among the Great Lakes States, and only receives 43 cents back on every transit dollar it contributes to the highway trust fund.

This shortfall exists despite the significant contribution by Michigan taxpayers. Michigan ranks 6th, behind five States with rail, in direct support for its public transit systems.

I am pleased to be here today as we begin our work on improving our mass transit programs. I hope to be able to work with my colleagues on this Committee to help States like Michigan, increase access to public transportation, which will improve our economy and our quality of life.

Thank you.

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## PREPARED STATEMENT OF SENATOR WAYNE ALLARD

I would like to thank Chairman Shelby for holding this hearing. Bus Rapid Transit is probably one of the most frequently discussed areas of reauthorization, so it is only appropriate that we examine it here in this Committee.

I am pleased to see that the Federal Transit Administration has taken steps to make Bus Rapid Transit more widely available. I strongly believe in local decisions. It is important that we allow local groups to consider as many options as possible.

It is especially sensible that we do more to promote Bus Rapid Transit as an option when it has the potential to offer similar capacity to rail systems at only a fraction of the cost.

In expanding the existing transit programs to encompass Bus Rapid Transit, there are a number of issues that the Banking Committee must carefully consider. Namely, how can we offer BRT as an option and allow maximum flexibility, while also ensuring that the money is going toward genuine BRT, that is to say projects that offer significant, genuine corridor improvements. I do not think that anyone on this Committee has the desire to invest more taxpayer dollars in a project that is really nothing more than a repainted version of traditional bus service.

Some advocate the standard of a fixed guideway as the baseline for a BRT project. While that can be an important indicator, I am not convinced that a fixed guideway alone should determine eligibility for BRT money.

For example, many of Colorado's mountain communities are facing transportation difficulties, particularly with workforce commuting issues. Some are examining BRT as a sensible option to address their needs. However, given the physical limitations of the mountain valleys and existing roads, it would be extremely cost prohibitive for them to construct a separate right of way. However, BRT still offers them one

of the best options available. I do not want to preclude them from considering that possibility.

I am hopeful that we can find standards that demonstrate a genuine BRT project, while still allowing flexibility for local decisions. This hearing is a good step in that direction.

I would like to thank the witnesses for being here today. Your testimony will be a significant help to the Committee as we continue to consider reauthorization of TEA–21. I look forward to your testimony.

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## PREPARED STATEMENT OF SENATOR ELIZABETH DOLE

.I want to thank you, Mr. Chairman, for holding today's hearing on Bus Rapid Transit and other bus service innovations. Bus service has long provided an important transportation option for communities across the Nation. Bus Rapid Transit represents an effort to take advantage of the low cost of bus services compared to more expensive mass transit alternatives, thereby maximizing the effectiveness of our transit dollars.

Bus Rapid Transit projects can combine relatively low vehicle and roadway construction costs with the modern stations, frequent service, and dedicated pathways associated with rail and light rail alternatives. In doing so, we create a convenient, efficient and cost-effective transportation alternative that has the added environmental benefits associated with decreasing the number of cars on the road.

Despite their obvious appeal for our cities, Bus Rapid Transit systems face some challenges. Some believe that middle class and wealthy populations will refuse to use bus services because they view these services as being for low-income individuals. This view can affect the community planning choices made by developers and retailers, who are an important part of any new mass transit project. Also, some question the long-term operational costs of a Bus Rapid Transit system when compared to a rail or light rail alternative whose operational costs are seen as lower.

These issues are very important to North Carolina, especially considering the fact that the Charlotte Area Transit System has plans for the use of Bus Rapid Transit facilities in three of the planned corridors and already has over two miles completed in the Southeast Corridor. Bus Rapid Transit represents an important option for mass transit that I hope will become a reality for other North Carolina communities as well.

I would like to thank our witnesses for taking the time to join us here today to share their perspectives with us. I look forward to working with my colleagues on this and other transportation issues as we prepare to reauthorize the Transportation Equity Act for the 21st Century.

Thank you.

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## PREPARED STATEMENT OF JENNIFER L. DORN

ADMINISTRATOR, FEDERAL TRANSIT ADMINISTRATION
U.S. DEPARTMENT OF TRANSPORTATION

JUNE 24, 2003

Mr. Chairman and Members of the Committee, thank you very much for the opportunity to testify today on the subject of Bus Rapid Transit (BRT) and other bus service innovations.

History tells us that the means by which we travel will change, but public transit can be expected to remain an important mode of transportation in America. In the early 1800's, Americans relied on their own feet, horses, and buggies to get from one place to another. In the mid-nineteenth century, railroads began crossing the continent, and by the turn of the century, subways and streetcars became their urban equivalent. Although the automobile first appeared in the early 1900's, most Americans still depended on buses, streetcars, and subways for transportation until after World War II, when the highway network expanded, most urban streets were paved, and the car became an affordable transportation choice. The automobile is, in fact, a relatively recent arrival in the history of transportation.

Now, at the dawn of the 21st century, with traffic congestion, energy and environmental challenges, and the desire for greater independence and economic opportunity, we are witnessing the reemergence of public transportation as the mode of choice for many Americans. Key to this reemergence is continued innovation, as we

develop new ideas and new technologies, and expand the number and scope of safe, fast, convenient, and reliable public transportation options.

The Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA) and the Transportation Equity Act for the 21st Century (TEA–21) have played a critical role in the resurgence of public transportation in America. Among the most important provisions was shaping the New Starts program, as we know it today, to help growing communities plan and construct new permanent public transportation systems or expand those already in existence. When these laws were passed, transit "fixed guideway" systems—subways, light rail, commuter rail, trolleys—were envisioned as the options for communities to consider as they created the next New York subway, San Francisco trolley, or Chicago "el." But in the few short years since TEA–21 was signed into law, a new option has emerged—Bus Rapid Transit—that does not necessarily require a fixed guideway. Continued public and private investment in the development of new public transportation technologies is certain to generate additional options in the coming years.

In my remarks today, I will discuss the success and potential of Bus Rapid Transit as we know it today, as well as the Administration's proposed changes for the New Starts program in the President's fiscal year 2004 budget and reauthorization of the surface transportation programs.

**Bus Rapid Transit**

Let me tackle the hardest question first: What is Bus Rapid Transit? This question is difficult because Bus Rapid Transit is not defined by a predetermined set of physical characteristics. Fundamentally, it is a service—one that is fast, reliable, convenient, affordable, accessible, and aesthetically distinguishable from "regular" bus service.

Conventional urban bus operations bring to mind nondescript vehicles inching their way through congested city streets, delayed not only by other vehicles and traffic signals, but also by frequent and time-consuming stops to pick up and discharge passengers fumbling with coins as they board. Bus Rapid Transit systems, on the other hand, achieve their superior service levels by incorporating some or all of the following features:

- *Express service* with fewer bus stops, wider station spacing, and off-line boarding to shorten the amount of time spent at stations and improve travel time.
- *Vehicle tracking systems* that use satellites or roadside sensors and permit "next vehicle" information displays at stations, automated stop announcements for passengers, traffic signal priority, and enhanced safety and security.
- *Off-board fare collection systems*, that may include passes, prepurchased tickets, or "smart cards" that rely on microchip technology to speed fare collection and reduce boarding time.
- *Specialized roadways* that may include fixed guideways (such as expressways, busways, and streets designated for the exclusive use of buses) or nonfixed guideways (such as lanes barrier—segregated from other traffic by physical barriers, exclusive bus lanes on normal roadways, or even mixed traffic lanes that incorporate features like off-lane boarding or signal prioritization).
- *Improved vehicles* with low floors, wide aisles, and distinctive design, color, or graphics. Low-floor buses permit easy entrance and exit, comply with the requirements of the Americans with Disabilities Act (ADA) of 1990, and reduce the boarding time for persons using mobility aids. More and wider doorways also facilitate the rapid entry and exit of passengers, as does a well-designed interior space. Along with distinctive design, these features all help overcome negative perceptions of buses.
- *Vehicle control systems* that permit precision docking and level passenger boarding without causing damage to the vehicle's tires or structure. Vehicles can be equipped with sensors or mechanical systems to control the height, location along the platform, and distance from the platform.

At the high-end of the spectrum, BRT combines dedicated roadways, modern stations, high-tech vehicles, and frequent service that are characteristic of rail systems, but at a lower cost. BRT, however, also offers promise as a means to create real improvements in traditional bus service. In fact, the technological advances associated with Bus Rapid Transit are already being used to improve "regular" bus service. For example, automated vehicle location technologies, such as satellite or roadside sensors that track the location of vehicles, can be used to control traffic signals and give priority to transit vehicles. The signal priority system of the Los Angeles Metro Rapid Bus system along Wilshire Boulevard, for example, has reduced transit travel times by nearly 30 percent, and total bus ridership is up by almost 40 percent. Today, the Rapid Bus System in Los Angeles carries 45,000 passengers daily—

and that is in addition to the 45,000 daily riders on the "local" bus that travels the same corridor. The system has been so successful that the Los Angeles County Metropolitan Transportation Authority now operates a total of 65 route miles along four corridors, and plans to add another twenty-two corridors by 2008, at a rate of four per year.

**Funding Sources for Bus Rapid Transit**

Bus operation planning is generally the responsibility of the local transit operators, in cooperation with regional multimodal transportation planning agencies, such as metropolitan planning organizations (MPOs). A variety of service improvement strategies—including many improvements associated with Bus Rapid Transit—may be funded through a number of existing Federal Transit Administration (FTA) programs. These include the Urbanized Area formula program, Non-Urbanized Area formula program, and the Bus and Bus Facilities major capital investment program. Communities may also use Congestion Mitigation and Air Quality Improvement Program (CMAQ) and Surface Transportation Program (STP) funds (often referred to as "flex-funds").

When a community determines through its multimodal transportation planning process that a major transportation capital investment may be required to meet the mobility needs in a given corridor, it may decide to pursue the development, funding, and implementation of a New Starts project. The New Starts project planning and development process, as you know, is established in law, regulation, and guidance. It includes alternatives analysis, preliminary engineering, and final design, and it culminates in a full funding grant agreement for meritorious projects that rate well on the project justification and financial criteria established in law for all New Starts projects.

The FTA strongly encourages every community that is interested in New Starts project funding to consider and evaluate the costs and benefits of Bus Rapid Transit, along with other fixed guideway options that are currently eligible under the New Starts program. Mobility improvements, environmental impacts, operational costs, cost-effectiveness, and economic impacts should all be assessed when planners and local decisionmakers compare and select a locally preferred alternative for a corridor. Although a 2001 General Accounting Office (GAO) report comparing systems in four cities, found that BRT systems have lower capital costs, comparable operating costs, and greater flexibility than light rail systems, relatively few communities have selected Bus Rapid Transit as their locally preferred alternative.

Currently, the New Starts pipeline has five Bus Rapid Transit projects in preliminary engineering and one in final design. To date, three full funding grant agreements have been executed for fixed guideway bus projects in Pittsburgh, Boston, and Houston. All of these projects were initiated before the current concept of BRT took form.

- In Pittsburgh, the Port Authority of Allegheny County is constructing a five-mile busway to connect rapidly growing markets in the corridor between the city of Pittsburgh and Pittsburgh International Airport. The project includes the rehabilitation of an abandoned light rail tunnel for use by buses, six stations, and six park-and-ride lots. Portions of this system are already open, and it is expected to begin full service through the Wabash Tunnel in December 2004.
- In Boston, the South Boston Piers Transitway Project will link the South Boston area with regional mass transit services in downtown Boston. It consists of a one-mile tunnel and surface bus operations with three stations. Now under construction, this project is also expected to begin service in December 2004.
- In Houston, the Regional Bus project is largely operational and is scheduled for full revenue operations in December 2005, with new facilities, intelligent transportation systems technology, transit streets, and HOV lanes.

The GAO report suggests three reasons for the relatively few BRT New Starts projects: (1) Bus Rapid Transit is a relatively new concept, and many projects, especially those that have reached the final design and full funding grant agreement stage, were chosen before BRT, as we know it today, existed; (2) there is a perception among local decisionmakers that the public prefers rail service to bus service; and (3) some Bus Rapid Transit projects do not fit the fixed guideway, or exclusive right-of-way, requirements of the New Starts program and thus are not eligible for funding consideration.

FTA is committed to helping communities overcome these perception and information barriers by undertaking a major effort to: Promote the benefits of Bus Rapid Transit service elements; compile and share information about successful Bus Rapid Transit projects in the United States and abroad; and provide technical assistance, guidelines, and encouragement to community and transit leaders who are interested

in Bus Rapid Transit as a means to improve their regular bus service or respond to transportation needs in a corridor that require a major capital investment. In addition, the Administration is proposing, through the President's fiscal year 2004 Budget and its upcoming surface transportation reauthorization legislation, several changes in the New Starts program that will permit nonfixed guideway Bus Rapid Transit and other new, lower-cost technologies to receive New Starts funding.

It is very important to understand that Bus Rapid Transit will not be the right solution for every community. Considerations like population density, the existence of exclusive rights-of-way, centralized employment centers, and the impact of topography on system design and construction costs may make light rail, for example, more cost-effective than Bus Rapid Transit in a particular community.

**Promoting Bus Rapid Transit**

In 1999, the FTA formed the BRT Consortium, consisting of communities interested in implementing Bus Rapid Transit. Seven of the 18 consortium members now have Bus Rapid Transit in their communities: Los Angeles, Miami, Honolulu, Boston, Pittsburgh, Chicago, and Charlotte. The remaining consortium members all expect to initiate BRT revenue operations within the next 4 years. As you may know, Eugene, Oregon, is a member of the consortium, and is represented at today's hearing by Ken Hamm, General Manager of the Lane Transit District. Since 1999, consortium members have met nine times to discuss specific topics and explore solutions to the challenges they face. Any community that may be interested in a particular topic or in learning about BRT generally is welcome to attend consortium meetings. In fact, FTA maintains a mailing list of individuals and organizations that have expressed interest in BRT, and sends notices of meeting, workshops, and new publications to them.

FTA also provides technical assistance to consortium members, helping them to address specific development and operational challenges. In addition, eleven of the consortium members, designated as "demonstration projects," have received grants to participate in consortium activities, collect data, and conduct BRT program evaluations. The information collected will be used to analyze and compare the costs and benefits of specific BRT features, including ridership, capacity, travel-time savings, and operating costs, and will help FTA prepare guidelines and tools for communities to use as they examine alternatives and options to improve mobility.

Other activities sponsored by FTA's BRT research and technical assistance program include:

- The development and delivery of a National Transit Institute workshop entitled "Exploring the Potential of Bus Rapid Transit," which offers transportation professionals and decisionmakers an introduction to BRT, including considerations in planning infrastructure and facilities, service planning, vehicle selection, technology applications, and implementation and institutional issues.
- The development and execution of a BRT webpage on the FTA public website, which features information about current BRT projects throughout the country, a calendar of upcoming BRT workshops and events, a BRT primer, copies of FTA-sponsored publications, and video clips and photos of BRT systems in operation.
- A BRT vehicle design competition, which was intended to generate interest in and awareness of the desirable characteristics of future potential BRT vehicles and systems. Four designs received top honors, and 18 additional awards were given for a variety of innovative ideas and vehicle design concepts. Winning entries are also featured on FTA's BRT webpage.
- A series of BRT publications, including BRT Project Evaluation Guidelines, An Evaluation of the Port of Allegheny's West Busway, BRT Vehicle Demand and Supply Analysis, Bus Rapid Transit and the American Community, and An Analysis of FTA's Bus Testing Program with Respect to Bus Rapid Transit Vehicles, as well as various BRT Workshop Proceedings.
- Funding and technical assistance to establish the BRT Institute to conduct research and act as a BRT information clearinghouse. The Institute is a partnership between the Center for Urban Transportation Research in Tampa, Florida, and Partners for Advanced Transit and Highways in Berkeley, California.
- The creation of a computer modeling tool, now in final stages of development, to assist transportation planners in determining the most appropriate BRT elements to address traffic conditions and ridership demand.
- In conjunction with the Transportation Research Board of the National Academy of Sciences, the publication of "Case Studies in Bus Rapid Transit" and the development of BRT planning and implementation guidelines.
- International meetings and technical tours have been conducted with transit officials in Italy, Switzerland, France, and Britain to introduce United States manu-

facturers to overseas markets and gather information about successful BRT systems that may be emulated in United States cities. As a result, representatives of Irisbus and Phileas Bus, which manufacture buses used in France and the Netherlands, are engaged in discussions with American bus manufacturers regarding potential partnership opportunities.

Additional Bus Rapid Transit systems outside the United States that may offer significant educational and market development opportunities operate in Curitiba, Brazil; Ottawa, Canada; and Bogotá, Colombia. In operation since 1974, the Curitiba Bus Rapid Transit system—often called the "surface subway"—is widely considered the world's preeminent example of Bus Rapid Transit. It offered a revolutionary solution for linking downtown to the neighborhoods through exclusive traffic lanes, combining an "express bus only" middle lane with two outer lanes for slower traffic. Curitiba's regional integrated transport network consists of 58 kilometers of exclusive bus lanes, over 2,000 buses, and 233 "tube stations" where passengers prepay their fare and board buses via ramps.

Ottawa's Transitway, which was built in stages between 1978 and 1996, is a 19-mile bus-only road that goes to the central business district, where it connects to exclusive bus lanes on city streets. Over 75 percent of passenger bus trips are made using the Transitway. The Transitway was constructed largely on rail rights-of-way and was designed for possible conversion to rail should future ridership warrant. The main Transitway routes use articulated buses with proof-of-payment fare collection to speed boarding; only one-quarter of the riders pay with cash.

Another success story that the FTA is studying is the Transmilenio bus system in Bogotá, Colombia. This innovative 38-kilometer bus system carries 600,000 passengers a day. Bogotá plans to expand the system to 388 kilometers by 2016.

**Proposed Changes in the New Starts Program**

As noted earlier, the GAO found that the development of Bus Rapid Transit systems was inhibited by the fact that BRT projects do not always fit the fixed guideway, or exclusive right-of-way, requirements of the New Starts program. The President's fiscal year 2004 Budget not only proposes to grow the New Starts program by $300 million, but also incorporates our surface transportation reauthorization proposal to expand eligibility for New Starts funding to include new or expanded nonfixed guideway corridor-based transportation projects.

We believe this change will help promote the development of commonsense transit solutions, as communities consider major capital investments to solve mobility problems in transportation corridors. As my testimony today has illustrated, with today's technology—particularly Bus Rapid Transit—the presence of a fixed guideway is not always required to create a cost-effective major new or expanded corridor system. Currently, however, by making the inclusion of a fixed guideway a fundamental requirement for a New Starts grant, we encourage communities to consider only these more expensive alternatives. Further, some small and medium-sized communities that would benefit enormously from the creation of new transit options simply cannot generate enough new riders or travel-time savings to justify a more expensive fixed guideway system.

I want to assure the Committee that, as we develop implementation guidelines for this change, we will work closely with Congress and with all of our stakeholders. We have no interest in opening the New Starts pipeline to what might be characterized as simply the purchase of "fancy" buses or normal bus system expansions; projects must involve the creation of a new system that provides substantially enhanced levels of service to a corridor or the extension of a current corridor system. We believe that policies and guidance can be developed that will effectively preserve the intent of the New Starts program, even as we make room for new cost-effective solutions. I would also like to mention, however, that we have intentionally omitted reference to Bus Rapid Transit in our legislative proposal. As we have learned, technology changes rapidly, and it is important that we preserve our ability to incorporate future cost-effective transportation innovations into the New Starts program.

In the context of the proposed eligibility change, we are proposing two additional modifications to the New Starts program. As you know, under current law, any project requesting less than $25 million in New Starts funding is exempt from the rigorous New Starts evaluation and ratings process. Unfortunately, experience has demonstrated that early project estimates can be inaccurate. On numerous occasions, project sponsors who intend to seek funds without participating in the project evaluation process suffer serious set-backs when they determine that they do, in fact, require more than $25 million in Section 5309 New Starts funding. Moreover, small projects that proceed without adequate attention to ridership and financial projections may find themselves in financial difficulty. An elimination of this exemption would deter project sponsors from dividing corridor transportation systems into

artificially small segments to avoid the New Starts evaluation process. Therefore, we propose to eliminate the $25 million exemption in the New Starts program. Under our proposal, any project that seeks Federal New Starts funds will be required to participate in the New Starts evaluation and rating process.

At the same time, we recognize that the complexity of New Starts projects can vary considerably. Therefore, we are proposing that projects requesting less than $75 million be subject to a simplified New Starts process. We would utilize the same evaluation criteria established by Congress for projects seeking more than $75 million in funding from New Starts that will focus on ensuring that all projects are merit Federal investment, but will accommodate the streamlined delivery of smaller projects.

**Conclusion**

Mr. Chairman, we believe that, taken together, these changes will help communities select the most cost-effective, commonsense transit solutions. Bus Rapid Transit can and should be one of the transportation options available to our growing communities. We believe that continued Federal investment in the development of this and other new transportation technologies holds enormous promise for America, and I want to thank you again for the opportunity to discuss this important subject with the Committee. I would be pleased to respond to any questions the Committee may have.

**PREPARED STATEMENT OF JAYETTA HECKER**
DIRECTOR, PHYSICAL INFRASTRUCTURE ISSUES
U.S. GENERAL ACCOUNTING OFFICE
JUNE 24, 2003

United States General Accounting Office

GAO

Testimony
Before the Committee on Banking, Housing, and Urban Affairs
U.S. Senate

For Release on Delivery
Expected at 10:00 a.m. EDT
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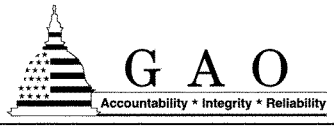
# FEDERAL TRANSIT ADMINISTRATION

# Bus Rapid Transit Offers Communities a Flexible Mass Transit Option

Statement of JayEtta Hecker, Director
Physical Infrastructure Issues



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# Highlights

Highlights of GAO-03-729T, a testimony before the Senate Committee on Banking, Housing, and Urban Affairs

## Why GAO Did This Study

Buses form the backbone of the nation's mass transit systems. About 58 percent of all mass transit users take the bus, and even in many cities with extensive rail systems, more people ride the bus than take the train. In recent years, innovative Bus Rapid Transit systems have gained attention as an option for transit agencies to meet their mass transit needs. These systems are designed to provide major improvements in the speed, reliability, and quality of bus service through barrier-separated busways (see photo), high-occupancy vehicle lanes, or reserved lanes or other enhancements on arterial streets.

The characteristics of Bus Rapid Transit systems vary considerably, but may include (1) improved physical facilities or specialized structures such as dedicated rights-of-way; (2) operating differences such as fewer stops and higher speeds; (3) new equipment such as more advanced, quieter, and cleaner buses; and (4) new technologies such as more efficient traffic signalization and real-time information systems.

This testimony, which updates a report GAO issued in September 2001, provides (1) information on federal support for Bus Rapid Transit systems and (2) an overview of factors affecting the selection of Bus Rapid Transit as a mass transit option.

www.gao.gov/cgi-bin/getrpt?GAO-03-729T.

To view the full testimony click on the link above. For more information, contact JayEtta Hecker, (202) 512-8984, heckerj@gao.gov.

June 24, 2003

FEDERAL TRANSIT ADMINISTRATION

# Bus Rapid Transit Offers Communities a Flexible Mass Transit Option

## What GAO Found

Federal grants are available for Bus Rapid Transit projects, primarily through the Federal Transit Administration's (FTA) New Starts program. However, only one project currently has a funding commitment since few Bus Rapid Transit projects are ready to compete for funding, competition for New Starts funding is intense, and certain types of Bus Rapid Transit projects are not eligible for New Starts funding because the program provides grants only for projects that operate on a separate right-of-way for the exclusive use of mass transit and high-occupancy vehicles. FTA is proposing to change this requirement so that more Bus Rapid Transit projects can be eligible for New Starts funding. In addition, constraints on the use or size of the other federal grants may limit their usefulness for Bus Rapid Transit projects. Under a demonstration program that began in 1999, FTA awarded $50,000 to each of 10 grantees for projects designed to help determine the extent to which Bus Rapid Transit can increase ridership, improve efficiency, and provide high-quality service. FTA plans to evaluate the demonstration projects to determine their most effective elements.

When selecting a mass transit system, communities consider its capital and operating costs, performance, and other advantages and disadvantages. In the cities that GAO reviewed, the per-mile capital costs of Bus Rapid Transit varied with the type of system—averaging $13.5 million for busways, $9.0 million for buses on high-occupancy vehicle lanes, and $680,000 for buses on city streets—and compared favorably with the per-mile capital costs of Light Rail. In the cities that GAO reviewed with both Bus Rapid Transit and Light Rail service, neither type of service had a consistent advantage in terms of operating costs, and Bus Rapid Transit was comparable to Light Rail in terms of ridership and operating speed. A major advantage of Bus Rapid Transit is its flexibility: buses can be rerouted to accommodate changing traffic patterns and can operate on busways, high-occupancy vehicle lanes, and city arterial streets. However, the public may view Bus Rapid Transit as less likely than Light Rail to improve a community's image and spur economic development.

**Bus Rapid Transit Service on a Barrier-Separated Busway**

Source: Charlotte Area Transit System.

Mr. Chairman and Members of the Committee:

We appreciate the opportunity to testify today on Bus Rapid Transit as an innovative option for improving bus service. Buses form the backbone of the public mass transit system in the United States. The majority of those who use mass transit, about 58 percent of all riders, take the bus. Even in many cities with extensive rail networks, such as Chicago and San Francisco, more people ride buses than use the rail systems.

In recent years, innovative Bus Rapid Transit systems have gained attention as an option for transit agencies to meet their mass transit needs. In general, Bus Rapid Transit is designed to provide major improvements in the speed, reliability, and quality of bus service through barrier-separated busways (see fig. 1), high-occupancy vehicle lanes, or reserved lanes or other enhancements on arterial streets. Bus Rapid Transit systems vary considerably in their characteristics but may include (1) improved physical facilities or specialized structures such as dedicated rights-of-way; (2) operating differences such as fewer stops and higher speeds; (3) new equipment such as more advanced, quieter, and cleaner buses; and (4) new technologies such as more efficient traffic signalization and real-time information systems.

**Figure 1: Barrier-Separated Busways**

Sources: Bus Rapid Transit Institute (top), Charlotte Area Transit System (bottom).

My testimony today will provide (1) information on federal support for Bus Rapid Transit systems and (2) an overview of the factors affecting the selection of Bus Rapid Transit as a mass transit option. My statement is primarily based on information presented in our September 2001 report on Bus Rapid Transit.[1] To complete that effort, we visited transit agencies in Dallas, Denver, Los Angeles, Pittsburgh, San Diego, and San Jose to obtain capital and operating cost information. We made cost and other comparisons between Bus Rapid Transit and Light Rail transit systems,

[1]U.S. General Accounting Office, *Mass Transit: Bus Rapid Transit Shows Promise*, GAO-01-984 (Washington, D.C.: Sept. 17, 2001).

which often compete as project alternatives. We also interviewed federal officials and industry experts to identify the advantages and disadvantages of Bus Rapid Transit. In addition, for the testimony, we obtained updates of the information in our 2001 report from Federal Transit Administration officials.

In summary:

- Federal support for Bus Rapid Transit projects may come from several different sources, including the Federal Transit Administration's New Starts, Bus Capital, and Urbanized Area Formula Grants programs.[2] However, few Bus Rapid Transit projects are scheduled to receive New Starts grant funding. Through fiscal year 2004, one Bus Rapid Transit project in Boston was awarded a New Starts grant, totaling about $331 million. New Starts commitments for Bus Rapid Transit projects are limited because (1) few Bus Rapid Transit projects are ready to compete for funding; (2) competition for New Starts funds is intense—currently, 85 mass transit projects at various stages are competing for funds; and (3) certain types of Bus Rapid Transit projects are not eligible for New Starts funding because the program provides funding only for projects that operate on separate right-of-ways for the exclusive use of mass transit and high-occupancy vehicles. In addition, constraints on the use or size of the other federal grants may limit their usefulness for Bus Rapid Transit projects. However, some programs that expand the capacity of highways, such as introducing new variable toll lanes, can be used in conjunction with Bus Rapid Transit to the mutual benefit of transit and highway users.[3] Besides awarding grants to construct systems, the Federal Transit Administration supports Bus Rapid Transit through a demonstration program that began in 1999. Under this program, $50,000 was provided to each of 10 grantees to improve information sharing among transit agencies about issues pertaining to Bus Rapid Transit. The demonstration program is designed to determine the extent to which Bus Rapid Transit can

[2]The New Starts program is the primary federal program that supports the construction of new fixed-guideway transit systems. As a result, its grants have generally been used to fund rail projects. The Bus Capital and Urbanized Grants programs provide funds to states that may be used to help fund Bus Rapid Transit projects as well as other state transit programs.

[3]The Federal Highway Administration's Value Pricing Pilot Program allows high-occupancy vehicle lanes to be converted to variable toll lanes. In one pilot program, toll revenues were used to operate an express bus service on the toll lanes. Expansion of this concept, where toll revenues fund Bus Rapid Transit service along the toll lanes, has been proposed in new pilot projects.

increase ridership, improve efficiency, and provide high-quality service. The grantees' projects include dedicated busways, bus lanes on arterial streets, improved technology on buses, and other innovations.

- Communities consider several factors when they select mass transit options. Our 2001 report examined such factors as capital cost and operating costs, system performance, and other advantages and disadvantages of Bus Rapid Transit. We found, for example, that the capital costs of Bus Rapid Transit in the cities we reviewed averaged $13.5 million per mile for busways, $9.0 million per mile for buses on high-occupancy vehicle lanes, and $680,000 per mile for buses on city streets, when adjusted to 2000 dollars.[4] For comparison, we examined the capital costs of several Light Rail lines and found that they averaged about $34.8 million per mile, ranging from $12.4 million to $118.8 million per mile.[5] In addition, in the cities we reviewed that had both types of service, neither Bus Rapid Transit nor Light Rail had a consistent advantage in terms of operating costs. We also found that Bus Rapid Transit compared favorably with Light Rail systems in terms of operating speed and ridership. Furthermore, Bus Rapid Transit has the advantage of being flexible: buses can be rerouted more easily to accommodate changing travel patterns to eliminate transfers; buses can operate on busways, high-occupancy vehicle lanes, and city arterial streets. However, Bus Rapid Transit has some disadvantages as well. For example, the public may view buses as slow, noisy, and polluting. Moreover, according to some transit agency officials, alternatives to Bus Rapid Transit, such as Light Rail, may be viewed as a hallmark of a "world-class" city and a means to improve the community's image and spur economic development.

## Background

Bus Rapid Transit involves coordinated improvements in a transit system's infrastructure, equipment, operations, and technology that give preferential treatment to buses on urban roadways. Bus Rapid Transit is not a single type of transit system; rather, it encompasses a variety of approaches designed to improve speed, reliability, and quality of service. We identified three general types of Bus Rapid Transit systems—those that

[4]Capital costs typically include the costs to plan, design, and construct a project.

[5]Light Rail transit is a metropolitan-electric railway system characterized by its ability to operate in a variety of environments, such as streets, subways, or elevated structures. Because Light Rail systems can operate on streets with other traffic, they typically use an overhead source for their electrical power, and passengers board from the street or platforms.

(1) use buses on exclusive busways, (2) share high-occupancy vehicle (HOV) lanes with other vehicles, and (3) provide improved bus service on city arterial streets. Busways—special roadways designed for the exclusive use of buses—can be totally separate roadways or separated by barriers from other traffic within highway rights-of-way. Busways currently exist in Pittsburgh, Miami, and Charlotte. Buses on HOV lanes operate on limited-access highways designed for long-distance commuters. Dallas, Denver, Houston, Los Angeles, and Seattle make extensive use of HOV lanes for buses.[6] Bus Rapid Transit service on busways or HOV lanes is sometimes augmented by park and ride facilities and entrances and exits for these lanes. Bus Rapid Transit systems using arterial streets may have lanes reserved for buses and street enhancements that speed buses and improve service. Los Angeles has instituted a type of Bus Rapid Transit service on two arterial corridors.

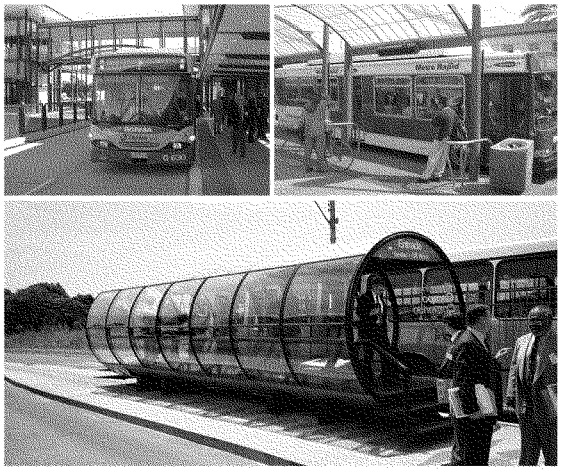
Bus Rapid Transit may also include any of the following features:

- *Traffic signal priority.* Buses receiving an early or extended green light at intersections reduce travel time—in Los Angeles, for example, by as much as 10 percent.
- *Boarding and fare collection improvements.* Prepaid or electronic passes increase the convenience and speed of fare collection, and low-floor or wide-door boarding saves time.
- *Limited stops.* Increasing distances between stations or shelters improves operating speeds.
- *Improved stations and shelters.* Bus terminals and unique stations or shelters differentiate Bus Rapid Transit service from standard bus service. (See fig. 2.)
- *Intelligent Transportation System technologies.* Advanced technology can maintain consistent distances between buses and inform passengers when the next bus is arriving.
- *Cleaner and quieter vehicles.* Improved diesel buses and buses using alternative fuels are cleaner than traditional diesel buses.

[6]Los Angeles and Houston originally built their systems as exclusive busways and later converted them to HOV facilities.

In our September 2001 review of Bus Rapid Transit systems, we found that at least 17 U.S. cities were planning to incorporate aspects of Bus Rapid Transit into their operations.

**Figure 2: Improved Stations and Shelters**



Source: Bus Rapid Transit Institute.

## Federal Grants and a Demonstration Program Are Available to Help Support Bus Rapid Transit Projects

A variety of federal grant programs could be used to help fund Bus Rapid Transit projects, but few projects are in line to receive awards. The Federal Transit Administration (FTA) has also provided funding for several Bus Rapid Transit projects through a demonstration program.

## One Bus Rapid Transit Project Is Receiving Federal New Starts Grant Funding

Grant funds administered primarily by FTA and, to a lesser extent, by the Federal Highway Administration are available for Bus Rapid Transit projects. However, few Bus Rapid Transit projects are ready to compete for these funds, competition for funding is intense, and constraints on the use and size of the grants limit their usefulness for Bus Rapid Transit projects.

FTA's New Starts Program is the primary source of federal funding for the construction of new transit systems and extensions to existing systems. It provides grants of up to 80 percent of the capital costs of bus and rail projects that operate on exclusive rights-of-way.[7] To obtain funds, a project must progress through a local or regional review of alternatives, develop preliminary engineering plans, and receive FTA's approval of the final design. FTA annually proposes New Starts projects to the Congress for funding, basing its proposal on an evaluation of each project's technical merits, including its planned mobility improvements and cost effectiveness, and the stability of the locality's financial commitment. In making its funding proposal each year, FTA gives preference to projects with existing grant agreements. FTA then considers projects with overall ratings of "recommended" or "highly recommended" under the evaluation criteria. The Transportation Equity Act for the 21st Century (TEA-21) authorized about $6 billion in "guaranteed" funding over 6 years for New Starts transit projects.[8]

As table 1 indicates, few Bus Rapid Transit projects are ready to compete for New Starts funding. Apart from the one project that has already received a funding commitment, none has progressed far enough for FTA to evaluate it for funding, and not all of the six projects that are in the preliminary engineering and final design categories may decide to compete for New Starts funding.

[7]A full-funding grant agreement establishes the terms and conditions for federal participation, including the maximum amount of federal funds to be made available to the project. The administration has recommended reducing the cap on New Starts funding to 50 percent of a project's cost to ensure that local governments play a major role in funding these transit projects. Under the current program, transit agencies could supplement New Starts funds with other federal transit funds for a total federal contribution of up to 80 percent. In addition, for fiscal year 2003, FTA instituted a preference policy of favoring projects seeking only 60 percent for the maximum federal share for all current and future projects because it wanted to fund more projects.

[8]These funds are subject to a procedural mechanism designed to ensure that minimum amounts are provided each year. In addition, TEA-21 authorized FTA to make contingent commitments subject to future authorizations and appropriations acts.

**Table 1: Proposed Fiscal Year 2004 New Starts Program Funding for Bus Rapid Transit**

Dollars in millions

| | Total New Starts | | Bus Rapid Transit portion | |
|---|---|---|---|---|
| **Category of projects** | **Number of New Starts projects** | **Actual or proposed funding[a]** | **Number of Bus Rapid Transit projects** | **Actual or proposed funding[a]** |
| Projects with full-funding grant agreements | 26 | $7,375 | 1 | $331 |
| Projects pending full-funding grant agreements | 3 | 772 | 0 | 0 |
| Projects in final design | 14 | 3,622 | 1 | 123 |
| Projects in preliminary engineering | 42 | 19,343 | 5 | 1,149 |
| Other projects authorized[b] | 123 | N/A | 8 | N/A |
| **Total** | **208** | **$31,112** | **15** | **$1,603** |

Legend: N/A = Not applicable.

Source: GAO analysis of FTA data.

[a]For projects with full-funding grant agreements, figures represent amounts committed; for projects in other categories, figures represent amounts proposed by transit agencies for New Starts funding.

[b]Includes projects that were specifically identified in FTA's Proposed Fiscal Year 2004 Annual Report on New Starts as having Bus Rapid Transit as one of the transit options being considered.

In addition to Bus Rapid Transit projects, Light Rail, Heavy Rail, and Commuter Railroad projects can compete for New Starts funding. Nationwide, over 200 projects are now in various stages of development, and these other types of projects outnumber Bus Rapid Transit projects in all of the New Starts program categories. Of the approximately $7.4 billion in proposed commitments for New Starts projects with full-funding grant agreements for fiscal year 2004, about $4.6 billion is for Light Rail, $2.0 billion for Heavy Rail, $430 million for Commuter Rail, and $330 million for Bus Rapid Transit. The funding for Bus Rapid Transit was awarded to a project in Boston.

A constraint on the use of New Starts funding further limits its use for Bus Rapid Transit projects. Currently, the program requires that, to be eligible for funding, a project must operate on separate rights-of-way for the exclusive use of mass transit and high-occupancy vehicles. While some Bus Rapid Transit projects, such as busways, fit this requirement, others, such as those that operate buses on city streets in mixed traffic, do not. FTA has proposed changing the fixed-guideway requirement in its fiscal year 2004 budget proposal. Under the proposal, new non-fixed-guideway improvements done on a corridor basis would be eligible for New Starts funds. This change could allow New Starts funds to be used for arterial street Bus Rapid Transit projects, because these projects operate in specific corridors.

Other federal programs also provide grants for transit projects, but constraints on the use or size of these grants may limit their usefulness for Bus Rapid Transit projects. For example:

- As we noted in our 2001 report, transit agencies can apply funds obtained through FTA's Urbanized Area Formula Grants program to Bus Rapid Transit and other transit projects. This program provides capital and operating assistance to urbanized areas with populations of more than 50,000. However, areas with populations over 200,000 may only use the funds for capital improvements.

- The Bus Capital Program provides a large number of relatively small grants to states and local transit agencies for bus improvements. In fiscal year 2003, the Congress appropriated about $651 million for 387 grants, ranging from $30,000 to $16 million; the largest amounts were typically provided for statewide bus projects. In fiscal year 2003, a number of Bus Rapid Transit projects are expected to receive funds under this program. For example, the Hartford-New Britain busway project in Connecticut was allocated about $7.4 million, and the Bus Rapid Transit system in Honolulu was allocated about $7.9 million. While these funds can be combined with funds from other programs, such as New Starts, they are generally not sufficient to fund a major Bus Rapid Transit project alone.

- Bus Rapid Transit and other transit projects can qualify for certain types of federal highway funds administered by the Federal Highway Administration. For example, as noted in our 2001 report, transit agencies have used Surface Transportation Program and Congestion Mitigation and Air Quality Improvement funds to help pay for transit projects.[9] The Boston Bus Rapid Transit project, with a full funding grant agreement, did not plan to use highway funds as part of its project financing.

- Bus Rapid Transit can also be utilized in conjunction with the Federal Highway Administration's Value Pricing Pilot Program. This program allows high occupancy vehicle lanes to be converted to variable toll lanes, where the toll varies with the level of congestion on the highway. In a project on the I-15 freeway in San Diego, the revenue generated from the tolls is used to help fund an express bus service operating on the toll lane. Plans to build additional variable toll lanes in San Diego include expansion

[9]Among other things, Surface Transportation Program funds are provided to states to be used for the capital costs of transit projects. Congestion Mitigation and Air Quality Improvement Program funds are generally available to states for transportation projects designed to help them meet the requirements of the Clean Air Act.

of Bus Rapid Transit to operate on the new lanes. Projects such as this are limited, however, by a prohibition on charging tolls on the Interstate Highway System and by the inherently limited scope of the pilot program.

## FTA Supports Bus Rapid Transit through a Demonstration Program

In 1999, FTA initiated a demonstration program to generate familiarity and interest in Bus Rapid Transit. From FTA's perspective, Bus Rapid Transit is a step toward developing public transit systems that have the performance and appeal of Light Rail systems, but lower capital costs. FTA contends that using technological advancements will allow buses to operate with the speed, reliability, and efficiency of rail systems. FTA promotes the Bus Rapid Transit concept with the slogan "think rail, use buses."

The goal of the demonstration program was to promote improved bus service as an alternative to more capital-intensive rail projects. The program provided $50,000 to 10 transit agencies to share information and data on new Bus Rapid Transit projects.[10] FTA wanted the Bus Rapid Transit program to show how using technological advancements and improving the image of buses would allow buses to increase ridership and operate with the speed, reliability, and efficiency of Light Rail. The grantees in the demonstration program may also be eligible for federal capital funds through the New Starts, Bus Capital, and Urbanized Area Formula Grants programs. FTA has held workshops focusing on developing components of Bus Rapid Transit systems, such as vehicles, marketing and promoting the system's image, fare collection, and traffic operations.

Some localities participating in the demonstration program have planned or put in place more extensive components of a Bus Rapid Transit system than others. For example, Miami and Charlotte have busways for the exclusive use of buses, while San Jose is implementing technological and service improvements, such as signal prioritization on a high-ridership HOV-lane arterial corridor. In Eugene, plans are to purchase buses that will look like trains and operate in special bus lanes. In Cleveland, an extensive Bus Rapid Transit project is planned that involves the extensive reconstruction of Euclid Avenue, including signal prioritization, bus

[10]FTA recently provided funding to Los Angeles, California and Las Vegas, Nevada. The program includes six additional members of the Bus Rapid Transit consortium. These consortium members attend workshops and support the program's goals.

station structures, and reconstructed sidewalks along the corridor. Table 2 summarizes differences in the components of Bus Rapid Transit demonstration projects.

**Table 2: Elements of Bus Rapid Transit in the FTA Demonstration Program's Projects**

| Elements | Boston | Charlotte | Cleveland | Washington, D.C.; Dulles | Eugene | Hartford | Honolulu | Miami | San Juan | San Jose |
|---|---|---|---|---|---|---|---|---|---|---|
| Busways | | • | | | • | • | | • | | |
| Bus lanes | • | • | • | | | • | | • | | |
| Bus on HOV-Expressways | | • | | •[a] | | | • | | • | |
| Signal priority | | • | • | • | • | | • | | | |
| Fare collection improvements | | | • | • | • | | | | | • |
| Limited stops | • | | • | • | • | | • | • | | • |
| Improved stations and shelters | | • | • | • | • | • | | • | | • |
| Intelligent transportation systems | • | • | • | • | • | • | • | • | • | • |
| Cleaner/quieter vehicles | • | | • | | • | | | | | |

Source: GAO presentation of FTA information.

Note: Individual elements may change as demonstration projects evolve.

[a]Includes the use of a limited-access airport road.

FTA plans to evaluate the demonstration projects after they are implemented. Through these evaluations, FTA wants to determine the most effective Bus Rapid Transit elements so that other transit agencies can model similar systems.

## Several Factors Affect the Selection of Bus Rapid Transit As a Mass Transit Option

Decisions to pursue a Bus Rapid Transit project require significant planning and analysis of factors associated with transit options. Our 2001 report examined such factors as capital and operating costs, system performance, and other advantages and disadvantages of Bus Rapid Transit.

### Capital and Operating Costs

The cost of constructing a mass transit system is a major consideration for communities as they evaluate their transportation options. Our September 2001 report examined 20 existing Bus Rapid Transit lines and found that

Bus Rapid Transit capital costs, when adjusted to 2000 dollars, averaged $13.5 million per mile for busways, $9.0 million per mile for buses on HOV lanes, and $680,000 per mile for buses on city streets.[11] To put this information in perspective, we also determined the capital costs for 18 existing Light Rail lines and found that, when adjusted to 2000 dollars, they averaged about $34.8 million per mile, ranging from $12.4 million to $118.8 million per mile. Bus Rapid Transit has some capital cost advantages because it does not require certain features typical of rail systems, such as train signals, electrical power systems, and overhead wires to deliver power to trains, nor does it need rail, ties, and track ballast. As a result, Bus Rapid Transit projects typically cost less to build than some alterative approaches.

The operating cost associated with alternatives also need to be considered in selecting a transit option. Our 2001 report analyzed operating costs for six cities that had some form of Bus Rapid Transit and Light Rail systems.[12] In general, we found that the operating cost of Bus Rapid Transit varied considerably from city to city and depended on what cost measure was used. In considering operating costs, we did not find a systematic advantage of one mode over the other.

## System Performance

An important objective of any mass transit system is to move as many people as quickly as possible. Ridership and the speed of a system are therefore factors to be considered in selecting transit options. In the systems we examined, these factors varied considerably for Bus Rapid Transit. For example, we found that Bus Rapid Transit ridership on 4 busways ranged from about 7,000 to about 30,000 per day, and averaged about 15,600 per day. For 13 bus lines on HOV lanes, ridership varied from about 1,000 to 25,000 per day. In addition, the ridership on the two arterial-street Bus Rapid Transit lines in Los Angeles was about 9,000 to 56,000 per day, with an average of 32,500 per day. Thus, Bus Rapid Transit systems are capable of moving large numbers of passengers each day. We also found that Light Rail ridership varied widely on the 18 lines we reviewed, ranging from 7,000 to 57,000 riders per day and averaging about 29,000 per day.

[11]Project capital costs typically include the costs to plan, design, and construct a project.

[12]The six cities were Dallas, Denver, Los Angeles, Pittsburgh, San Diego, and San Jose.

According to a transportation consultant we contacted for our 2001 report, system speed generally depends on characteristics such as the distance between stops, fare-collection methods, and the degree to which the roadway or tracks are reserved for transit vehicles or share the right-of-way with cars and other vehicles. Our analysis for the 2001 report showed a range of average speeds for Bus Rapid Transit, from 17 miles an hour for an arterial system on city streets to over 55 miles an hour for a system that used HOV lanes. We also found that, in most instances, Bus Rapid Transit was faster than Light Rail in the six cities in our study.

## Other Advantages and Disadvantages of Bus Rapid Transit

The other advantages and disadvantages of Bus Rapid Transit could also affect a community's decision to pursue it as a mass transit option. For example, Bus Rapid Transit generally has the advantage of being a flexible system that can respond to changes in employment, land-use, and community patterns by increasing or decreasing capacity. In addition, Bus Rapid Transit routes can be adjusted and rerouted over time to serve new developments and dispersed employment centers that may have resulted from urban sprawl. Bus Rapid Transit systems also have the ability to operate both on and off a busway or bus lane, giving them the flexibility to respond to operating problems. Furthermore, Bus Rapid Transit has flexibility in how it is implemented and operated. For example, it is not necessary to include all the final elements of a system before beginning operations; improvements, such as signal prioritization or new low-floor buses, can be added as they become available. Another advantage is that Bus Rapid Transit can be coupled with other transportation system improvements, such as newly added toll or variable toll lanes, to the mutual benefit of both transit and highway users.[13] Transit users benefit from a new high-speed transit option, which could be funded from the toll revenues generated by the new lanes, while highway users would benefit from fewer drivers on the highway as a result of adding the high-speed transit option.

Bus Rapid Transit also presents some disadvantages that may influence communities' decision-making. For example, according to a number of transit agency officials and experts, bus service has a negative image, particularly when compared with rail service. Communities might not

[13]For example, under the Federal Highway Administration's Value Pricing Pilot Program, a project in San Diego has proposed using toll revenue generated by newly constructed variable toll lanes to pay for Bus Rapid Transit service operating on the new capacity.

favor Bus Rapid Transit, in part because the public often views buses as slow, noisy, and polluting. In addition, the public might view an alternative to Bus Rapid Transit, such as Light Rail, as the mark of a "world-class" city and a means to improve the community's image and stimulate economic development. According to transit agency officials, because rail systems have permanent stations and routes, developers are more likely to locate new business, residential, or retail development along a rail line than along a bus route. As more experience is gained with Bus Rapid Transit, its advantages and disadvantages will become better understood.

Mr. Chairman, this concludes my testimony. I would be pleased to answer any questions that you or Members of the Committee may have.

## Contact and Acknowledgments

For further information on this testimony, please contact JayEtta Hecker at (202) 512-2834 or heckerj@gao.gov. Samer Abbas, Robert Ciszewski, Elizabeth Eisenstadt, and Glen Trochelman made key contributions to this testimony.

# Appendix I: Locations in FTA's Bus Rapid Transit Demonstration Program

Ten locations were originally included in FTA's Bus Rapid Transit Demonstration programs. In addition, various locations are consortium members that do not receive direct funding, but attend workshops and support program goals. The demonstration and consortium locations are shown below.

| Demonstration Site | Consortium Member |
|---|---|
| Boston, MA | Alameda and Contra Costa, CA |
| Charlotte, NC | Albany, NY |
| Cleveland, OH | Chicago, IL |
| Dulles Corridor, VA | Las Vegas, NV |
| Eugene, OR | Louisville, KY |
| Hartford, CT | Montgomery County, MD |
| Honolulu, HI | Pittsburgh, PA |
| Miami, FL | |
| San Jose, CA | |
| San Juan, PR | |

## PREPARED STATEMENT OF GARY L. BROSCH

CHAIRMAN, NATIONAL BUS RAPID TRANSIT INSTITUTE
CENTER FOR URBAN TRANSIT RESEARCH
UNIVERSITY OF SOUTH FLORIDA AND THE INSTITUTE OF
TRANSPORTATION STUDIES AT THE UNIVERSITY OF CALIFORNIA, BERKELEY

JUNE 24, 2003

Good afternoon, Mr. Chairman and Members of the Committee. I am here today on behalf of the National Bus Rapid Transit Institute (NBRTI), a collaborative effort between the Center for Urban Transportation Research at the University of South Florida and the Institute of Transportation Studies at the University of California, Berkeley. With me today are Dennis Hinebaugh, Director of the National Bus Rapid Transit Institute and Senior Researcher Michael Baltes. Thank you for this opportunity to share with you our enthusiasm for Bus Rapid Transit and the important role we expect it to have in increasing transit ridership with a cost-effective, faster, flexible, and high-quality mass transit service in many cities throughout America.

My testimony today will provide you with information on the National Bus Rapid Transit Institute, important lessons learned about BRT, and our suggestions for your consideration on Federal issues that need to be addressed related to BRT.

### NBRTI

The National Bus Rapid Transit Institute was established in 2001 with the mission to *"facilitate the sharing of knowledge and innovation for increasing the speed, efficiency, and reliability of high capacity bus service through the implementation of Bus Rapid Transit systems in the United States."*

Multiple partners currently fund the National Bus Rapid Transit Institute. The Federal Transit Administration, the Federal University Transportation Centers Program and match from State DOT research funds, has provided initial funding of program startup and information sharing activities. The NBRTI also has smaller contracts to assist in the development of BRT programs in Minneapolis, Chicago, Riverside, and soon in Miami and Tampa. Continued and expanded funding for the NBRTI is being requested as a part of the TEA–21 reauthorization.

Current activities of the NBRTI program include:

- Evaluating BRT projects in Orlando and Miami
- Assisting in the administration of the 18 BRT Consortium member programs: Boston; Charlotte; Cleveland; Dulles Corridor; Eugene-Springfield; Hartford-New Britain; Honolulu; Miami; San Juan; Santa Clara County; Alameda & Contra Costa County; Albany; Chicago; Los Angeles; Louisville; Pittsburg; Montgomery County Maryland; Las Vegas
- Developing and implementing a BRT Peer-to-Peer technology transfer program
- Publishing the "*BRT Quarterly*" newsletter
- Maintaining the "NBRTI.org" website
- Presentations at workshops
- Industry assistance serving as the Chair of the TRB BRT Subcommittee, member of the APTA BRT Taskforce, moderators/presenters at national and international BRT conferences.

### Lessons Learned

The first lesson that we have learned about BRT is the difficulty in achieving consensus on its definition. The design and operation of BRT systems are vastly different from one another. The very nature of the flexibility in design and operations of BRT leads to the problem of creating a precise definition. While some BRT systems are similar, no two are alike. Los Angeles' BRT system is a highly effective yet very low cost system with buses operating in mixed traffic (that is, without special exclusive bus lanes). The buses themselves are clean fuel, conventional transit vehicles branded with a bright red paint scheme to differentiate them from standard local bus service. With their intelligent traffic signal system and high-frequency service (demand-based headways offering 1.5 minute service in the peak of the peak), they are able to significantly reduce overall trip time by as much as 30 percent on the Whittier-Wilshire and Ventura corridors. At the other end of the BRT spectrum is Las Vegas where they will be using a newly designed LRT-like vehicle which will travel using optical guidance on a fixed path to create a system that looks and functions much like a modern light rail system.

We believe flexibility is a key factor in the success of BRT and a flexible definition will lead to BRT systems being designed to best respond to the specific needs of a community rather than systems designed simply to qualify for Federal funding.

Another lesson learned is that even in auto dominated Los Angeles, people will ride a bus system that is fast, efficient, and convenient. The old myth that people will ride trains but not buses is based on a paradigm of trains being clean and fast and buses being dirty and slow. BRT has changed that paradigm! Success stories in the United States and abroad have shown that BRT can be a highly praised and successful form of public transit. Fast, convenient, and frequent service are what transit users want and the BRT systems provide all of these factors in a very cost-effective manner.

A surprising and important lesson we have learned is that nonusers of transit respond positively to BRT systems. Let me tell you why this is the case and why it is important. Non-transit users like BRT systems because they are perceived as being cost-effective and highly utilized. No one likes to see near empty buses or trains. BRT systems operating with very frequent service, with mostly full buses, in a cost-effective manner are pleasing even to the nonuser. Given the relatively low percentage of taxpayers riding transit, it is important that nontransit users perceive that their tax dollars are being used wisely. Without the support of nonusers, local funding commitments would not be possible. With the support of BRT system users and nonusers, local communities are finding BRT a truly win-win alternative.

**Future Federal Role in BRT**

Federal transportation policies and funding programs have played a tremendous role in shaping the form and content of America's transportation systems. From the creation of the Interstate System during the Eisenhower Administration, to the Federal New Starts program continued in current TEA–21 legislation, you, Members of Congress, provide direction to our transportation future. We believe the potential of BRT in America is so compelling as to warrant significant consideration in your deliberations on the reauthorization of TEA–21. Current Federal law provides little stimulus for BRT systems and, as you have heard from others, current Federal law with respect to New Starts actually inhibits development of lower-cost BRT systems.

As promising as BRT is, it cannot reach its full potential without your assistance in several areas.

*Research and Technical Assistance*

- Market research, facilities/operations planning, routing alternatives, ITS/APTS, transit signal priority, vehicle design, vehicle propulsion, vehicle guidance, peer-to-peer assistance.

*Evaluation of BRT Systems*

- Determine the effects and lessons learned of the various BRT demonstration projects through a detailed evaluation process.
- Through this detailed evaluation process, the various BRT projects will serve as learning tools and models for other locales throughout the United States.
- Characteristics to be examined include the degree to which ridership increases due to improved bus speeds, schedule adherence, and convenience; the effect on auto traffic; the effect of each of the components of BRT on bus speed and other traffic; the benefits of ITS/APTS applications to BRT projects; and the effect of BRT on land use and development.

*Consortium Members*

- BRT consortium members received modest funding ($50,000) to assist their efforts to learn about the potential of BRT of their areas. This is an excellent program to further interest in BRT, which should be continued and expanded.

*Method of Federal Funding*

- Three major options exist for enhanced Federal funding of BRT systems. First, a new program can be created to fund BRT systems in a similar manner as specific programs targeted to new rail systems, bus systems, etc. Second, the current New Starts program can be modified to better incorporate eligibility of BRT systems. Third, the Bus Capital Program (§ 5309) can be expanded to provide funding for BRT systems.
- Each of these options has strengths and weaknesses. Caution must be taken to avoid unintended consequences of the selected option. For example, including BRT in the bus program without additional funding could easily deplete funds needed for routine replacement. Alternatively, creation of a new program could result in local areas pursuing BRT systems simply because the funds are available.
- If BRT is to be included in the New Starts program, a number of details need to be examined including the requirement for "fixed guideway," the required local match (50/50 versus 80/20), and the MIS requirements. Clearly, the flexible definition of BRT will be an issue in any Federal funding alternative.

In conclusion, Bus Rapid Transit offers tremendous potential to increase transit ridership in a cost-effective manner. Historically, Congress has provided leadership in shaping our transportation system. BRT is an idea whose time has come. We encourage Members of this Committee to continue to exert this leadership in stimulating additional research, planning, funding, and implementation of BRT systems in the United States.

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**PREPARED STATEMENT OF KENNETH P. HAMM**

GENERAL MANAGER, LANE TRANSIT DISTRICT
EUGENE, OREGON

JUNE 24, 2003

Mr. Chairman, thank you for the invitation to testify here today. We appreciate your interest in Bus Rapid Transit, and thank you for considering our opinion as you prepare to write the transit portion of the next surface transportation bill.

**Background**

Lane Transit District is headquartered in Eugene, Oregon, and serves the central Lane County area. Eugene and its neighbor city of Springfield, together with the immediate suburbs, have a population of approximately 230,000 people. We are about 110 miles south of Portland, and Eugene is the home of the University of Oregon and the Fighting Ducks.

Lane Transit District has been recognized as one of the top transit systems in the country, and we consistently rank very high in per capita ridership and service level. We attribute our success to the implementation of innovative services and programs that have generated a positive response from the community.

In 1985, Lane Transit District was the first major transit system to equip all of its buses with lifts for people in wheelchairs. This was long before that became a requirement of the American with Disabilities Act. We also were a pioneer in the concept of what we call group passes. It started with the University of Oregon in 1987, when an agreement was reached whereby all students pay a transit fee as part of their student fees, and then can ride our system simply by showing their student ID. There are now approximately 30 organizations in our community, both public and private, that use group passes, and the program has been emulated by other transit districts around the country.

Eight years ago, members of our board of directors began to consider how our system could be improved further. How could we make a significant step up in the quality of our service in order to attract more riders? How could we guarantee on-time performance in the face of increasing traffic congestion? How could we control operating costs that were increasing annually due to congestion-related delays to our buses? Many in the community suggested light rail, and those suggestions led to a rail study. The conclusion was obvious: We are too small a community to support the investment in rail infrastructure. However, not willing to accept that as a final answer, the board directed staff to investigate the feasibility of designing our system to emulate as closely as possible the service characteristics and image of a rail system. That became Bus Rapid Transit, or BRT.

**BRT Defined**

BRT has taken on a number of forms within the country. In fact, that is one of the strengths of BRT: It has the flexibility of design to allow it to meet varying operating environments and political considerations. BRT can be considered a combination of a number of potential elements, including:

- Exclusive transitways to separate buses from traffic
- Transit signal priority at intersections
- Improved stops and stations
- Fewer stops per mile
- Off-board fare collection
- Level boarding onto low-floor buses
- Automated guidance, including precision docking at stations
- Real-time passenger information
- Tram-like, low-emission, quiet vehicles
- Rail-like image

Most of these elements have been proven in transit systems here and around the world. The innovation of BRT is to combine the elements into a package of improve-

ments across the country, BRT systems are being built using different combinations of these elements. We believe that it is important to have a very complete BRT system, for only in that manner can it truly emulate a light rail system. We believe that creating a rail-like image of the system is a key, and can be achieved by the design of exclusive transitways, improved stations, buses that have a tram-like appearance, and marketing.

LTD took the BRT concept to the community, to city councils, the board of county commissioners, and to the Oregon congressional delegation. The response was positive, and the BRT strategy is now a key element of the region's adopted transportation plan. The first phase of our Bus Rapid Transit project was authorized in TEA–21. Over time, as we worked to develop, define, and design our project, we became recognized as innovators and leaders in this new mode.

There have been a number of definitions proposed for BRT. One that we like is as follows:

> *Bus rapid transit (BRT) integrates capital and operational improvements with transit-supportive land use planning to create a faster, higher quality mode of travel than traditional bus service. BRT projects demonstrate permanence by using exclusive busways over at least half the BRT corridor and enjoy special treatment at intersections through traffic signal priority. BRT systems employ advanced fare collection and other techniques to reduce dwell times.*

BRT can fulfill a number of needs in communities around the country. For the medium-sized cities like ours, it provides an affordable rapid transit option. In our larger urban areas, it can be used to complement rail systems.

**LTD's BRT Project, Phase 1**

Our entire transit system is being planned around the BRT concept. BRT lines will operate on major corridors, with small buses circulating in neighborhoods, connecting those neighborhoods with the BRT line and with neighborhood shopping areas, schools, and employment areas. There will be a series of park and ride lots that provide access to the BRT line.

Like light rail, our BRT system is being built one corridor at a time. The first phase of our project is a four-mile-long segment connecting the downtowns of Eugene and Springfield. It follows a corridor that is our most heavily traveled arterial and serves the University of Oregon and a major regional medical facility. The BRT design for this corridor has 65 percent exclusive transitways and features transit signal priority, queue jumpers, median stations, off-board fare collection, and level boarding.

A key question that we are currently deciding is the vehicle to use for the BRT service. The ideal vehicle would be low-emission, quiet, have an entirely low-floor design, have automated guidance, have doors on both sides, and have a tram-like appearance. Vehicles with these characteristics are in development in Europe. We have not found an American manufacturer able to produce such a vehicle for us in the needed time frame.

The design and construction cost for the Phase 1 corridor (without the vehicles) is currently estimated to be $16 million, or $4 million per mile. This is about 10 percent of the cost of a moderately priced light rail line.

**Next Steps**

Construction is about to begin on the Phase 1 corridor, with implementation planned for early 2005, though the date likely will depend on the delivery date for the vehicle. When the Eugene and Springfield City Councils approved the Phase 1 corridor, they both requested that LTD immediately begin planning the next corridors, recognizing the greatest benefit of BRT, like light rail, is when there are multiple corridors that start to form a system. LTD is now in the planning stage for the next two corridors, and is seeking authorization for one of the corridors as part of the transportation bill. This is where you become very important to us.

Not only is the funding for the project important to us, but the match ratio is key. A transit system of our size has difficulty providing local match for large (for us) capital projects. Anything larger than a 20 percent local match would significantly slow the development of our BRT system

We believe very strongly that there needs to be some recognition of less expensive fixed guideway projects, like BRT, in the structure of your bill. The Administration proposed in its Fiscal Year 2004 Budget a "small starts" subcategory of New Starts. The small starts would have a more streamlined review and approval process to reflect their lower level of investment when compared to major new rail starts. We assume that the small starts subcategory also will be included in the Administration's reauthorization proposal. This subcategory may be acceptable if it is not too

inclusive. Projects in such a category should be limited by total cost, not just by Federal share costs, in order to ensure that they truly are smaller capital investments.

The Administration proposed in its Fiscal Year 2004 Budget recommendation a streamlined regulatory approach for these "small starts" projects. This is very appropriate, and we hope that you will impress upon the FTA the need to achieve a much simpler process than currently exists for New Starts. This will be easier to accomplish if the total size of the project is the determiner for this subcategory, not just how much the Federal share will be.

I had mentioned our difficulty in obtaining the appropriate BRT vehicle for our needs. Some funding or incentives for American vehicle manufacturers should be a part of your bill. This could be in the form of funds for research and development and engineering, or perhaps tax incentives for capital spent on redesign or retooling.

The FTA has been a good partner with us, and we look forward to working with them and with you as we develop our Bus Rapid Transit system. Thank you again for inviting us today.

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## PREPARED STATEMENT OF OSCAR EDMUNDO DIAZ

ENRIQUE PEÑALOSA'S ASSISTANT AT NEW YORK UNIVERSITY
ADMINISTRATIVE DIRECTOR AT THE INSTITUTE
FOR TRANSPORTATION AND DEVELOPMENT POLICY

JUNE 24, 2003

### ABSTRACT

Mr. Chairman and Members of the Committee, my name is Oscar Edmundo Diaz, and I am the Assistant to Enrique Peñalosa, former Mayor of Bogotá and the Administrative Director of the Institute for Transportation and Development Policy. I thank you for the opportunity to testify before the Committee on Banking, Housing, and Urban Affairs on the Bus Rapid Transit system we implemented in Bogotá, Colombia. I hope this testimony provides useful information for the reauthorization of the Transportation Equity Act for the 21st Century (TEA–21) and the inclusion of BRT programs.

Bogotá is a 7 million inhabitant city, in which growing car use began to deteriorate urban quality of life. This was compounded by a need for a better mass transportation system. Yet all it had was a chaotic fleet of 25,000 almost individually owned buses. Most buses were old and polluting. Drivers worked more than 12 hours daily; racing against other buses for passengers, which led to accidents and the practice of dropping passengers in the middle of the road. Drivers would even block the three lanes of an arterial road so as to impede buses coming from behind from overtaking them. Due to the congested and chaotic system, buses were very slow. This system was bad for the city, for passengers, for drivers, and even for bus owners, as it was not a profitable system. Nonetheless, a majority of citizens were forced to take such buses for their daily transport. A version of this exists in most developing country cities.

Mayor Enrique Peñalosa created from scratch a bus-based transit system that transformed the quality of life in our city: TransMilenio. Learning from Curitiba, TransMilenio encompassed specialized infrastructure and permanent supervision provided by local government agencies, and organized operations and advanced fare collections systems under contract with private firms. This Bus Rapid Transit system has changed Bogotanos lives, not only as mass transportation system, but also as a renewal of the city.

### BUS RAPID TRANSIT DEFINITION

A Bus Rapid Transit is essentially a surface metro system that utilizes exclusive segregated bus lanes. A Bus Rapid Transit (BRT) is high-quality, and customer-orientated transit that delivers fast, comfortable, and cost-effective urban mobility.

The main characteristics of BRT systems include[1]:

- Segregated busways;
- Rapid boarding and alighting;
- Clean, secure, and comfortable stations and terminals;
- Efficient prepaid ticket;
- Effective licensing and regulatory regimes for bus operators;

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[1]Wright, Lloyd. "Bus Rapid Transit, *Sustainable Transport: A Sourcebook for Developing Cities*," GTZ, Germany, 2003.

- Clear and prominent signage and real-time information displays;
- Transit prioritization at intersections;
- Modal integration at stations and terminals;
- High quality public pedestrian spaces;
- Clean bus technologies;
- Sophisticated marketing identity; and
- Excellence in customer service.

When Enrique Peñalosa became the Mayor of Bogotá, he discovered a Transportation Master Plan funded by the Japanese International Cooperation Agency (JICA). The plan's main proposals to solve Bogotá's traffic jams consisted of a metro system and elevated highways. At this time, Bogotá had one busway on Caracas Avenue, which did not work well. However, Mayor Peñalosa also discovered a contract to build another busway like the one in Caracas Avenue on Calle 80. This contract was going to be paid partially with a World Bank loan.

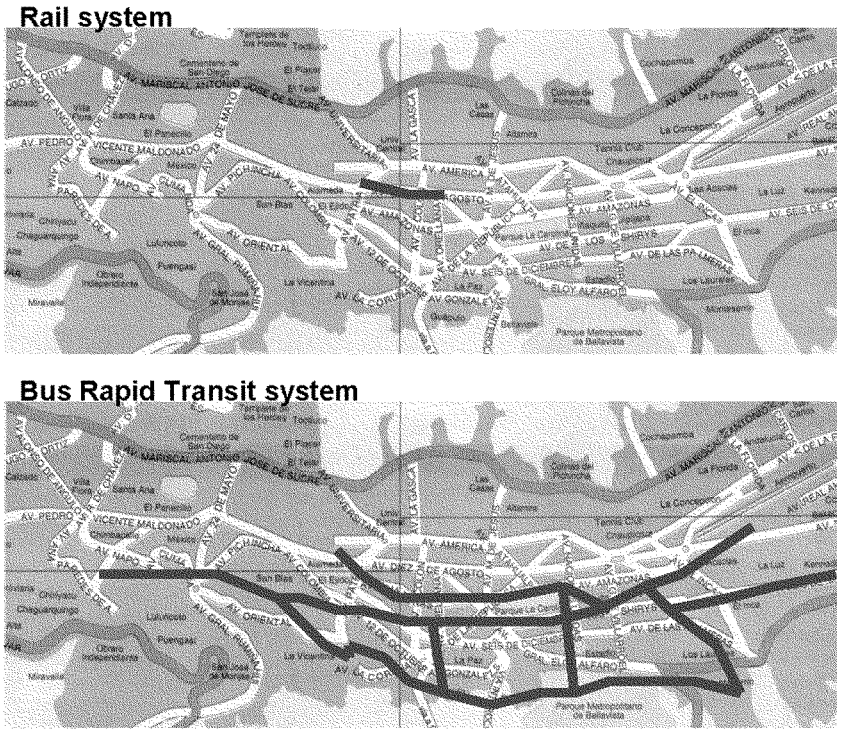
Avoiding or minimizing conflicts is one reason why many developing country cities prefer to invest in much more expensive rail systems than go to the trouble of putting bus-based transit in place. Some other reasons to choose rail include:

- Rail can have a larger capacity, though TransMilenio moves more passengers per kilometer than most rail systems. Bus systems can also install a parallel line nearby at a low cost and nearly duplicate capacity.
- Rail systems project an image of modernity. In cities sated with disastrous bus systems, citizens at first might not want buses and prefer an advanced rail model.[2]

However, Peñalosa decided not to build a metro system. Even if a one or two rail lines are put in place, buses will remain the only possible means to provide public transport to the majority of citizens of a developing country city. Rail system costs are very high. No subway in a developing country has cost less than $100 million per kilometer, a dubious investment in cities where many do not have even sewage, schools, or access to parks. *For the cost of one subway lane, it is possible to provide quality bus rapid transport to a whole city* (Graph 1). Bus-based transit systems have the advantages of lower investment and operational costs. They are more liable to receive private investment and to be operated privately. Bus systems are more labor intensive, an advantage in developing countries. It is easier to partially or totally build bus systems than train systems in developing countries. Finally, bus systems are more flexible, an important asset in developing countries dynamic cities. As city attractions shift, it is easier to adjust a bus system than a rail one.

[2]Peñalosa, Enrique. *Rethinking Third World Cities Transport*. UITP 55th Conference, Madrid, May 2003.

**GRAPH 1. Panama City map comparing a Rail System and a BRT System with same resources[3]**




With the money that Bogotá would pay in 1 year of interest for a loan to build the metro, Mayor Peñalosa built 155 miles of bicycle paths that currently move 5 percent of the population. In January 1998, only 0.5 percent of Bogotanos used the bicycle as a means of transportation.

The Washington Metro cost about US$11 billion for 166 kilometers and currently moves 824,000 passengers in a weekday. Comparatively, the cost for the Metro is more than $66 million per kilometer and moves almost the same number of people that TransMilenio moves over 41 kilometers at $5 million per kilometer. Not including the operational costs (the difference is enormous between the two systems), it is clear that in a developing city like Bogotá, with so many other needs for the poor, a different solution needed to be taken.

On the other hand, a busway like the one we had on Caracas Avenue was not the solution either. A new system—efficient, affordable, and comprehensive—needed to be created. That is what makes TransMilenio a successful project. It has *all* the characteristics that describe a potential BRT system. All of them in conjunction make possible an urban renewal. Some often overlooked aspects include the improvements in public spaces and sidewalks, which serve the system by making it safer and acting as feeders.

One of the first decisions that Peñalosa took was to stop the busway that was going to be built on Calle 80 and change the terms of the World Bank loan to build an exclusive bus corridor. The old busway did not have good public pedestrian access, no prepaid tickets, no stations. It was only two lanes in each direction reserved for the use of buses, which did not have schedules. *I want to emphasize this point: Sometimes a BRT system is thought to be just exclusive lanes for buses ignoring the other key components, which result in a bad quality system that does not function efficiently with the desired impacts.*

[3]Prepared by Lloyd Wright for the Institute for Transportation and Development Policy.

**THE BRT SYSTEM IN BOGOTÁ: TRANSMILENIO**

TransMilenio is a Bus Rapid Transit (BRT) integrated system that is high capacity and low cost. The TransMilenio system was designed and developed under the principle of respect:

- For life, by reducing fatalities due to traffic accidents and also reducing harmful emissions;
- For users' and their time: by reducing travel time, on average by 50 percent;
- For diversity: By offering full accessibility to young, elderly and handicapped, poor, among others;
- For quality and consistency: By using advanced transit technologies and providing a world-class system city wide at all times; and
- For economy and efficiency: By creating a system affordable by users and the city that is also good business to private operators. Two or four central lanes in main arteries are given exclusively to the system for buses to operate without any other traffic. Central lanes and not lanes next to sidewalks are used in order to avoid traffic often generated from driveway entrances, gas stations, and minor road intersections. As passengers board the buses at stations, central lane use also allows having one station serve both bus directions, instead of having two at each side of the road. Articulated 165-passenger high-platform buses stop at stations and open their doors simultaneously with station doors. Since passengers have already paid or have been charged through a contact-less card at the station entrance and the station and the bus floors are at the same level, a hundred passengers can come out and a hundred more board the bus in seconds. The bus corridors are fully accessible to the handicapped. Passengers reach the station either by an elevated pedestrian ramp or crossing the road supported by a traffic light.

Feeder buses in regular streets with shared traffic bring passengers to the trunk lanes to which they can transfer at no extra cost. One ticket permits one passenger to change from a local-stops bus that makes all stops, to an express one that only stops every 5 or 10 stations; passengers can also transfer from one line to another. Cost is the same regardless of trip length. As most lower-income citizens tend to live in the outskirts and make longer trips, they make more use of feeder buses and are subsidized by higher income citizens that make shorter trips.

The integrated system has 470 articulated buses operating in 41 Km with exclusive corridors with 61 stations, and 235 feeder buses in 309 Km mixed traffic local streets. In its second year of operations (2002), it transported 207 million paid passengers, with a maximum of 792,000 passengers per day and 35,000 passengers per hour per direction. The long-term plan envisions a total of 388 Km of exclusive lanes, from which 40 Km are under construction to be in operation in 2003–2005.

*TransMilenio is a nonsubsidized system, wherein all operating costs are recovered through the fares collected.* The TransMilenio ticket costs US$0.36 and that price covers all costs, except road infrastructure and stations. It is considered evident that since the government pays for road infrastructure for private cars, it must pay for roads used for public transport as well.

*TransMilenio is a public-private partnership.* Private contractors work in concert with TransMilenio S.A., the local municipal agency. TransMilenio S.A. manages bidding processes and controls the system operation but receives only 4 percent of the system's income. Private contractors who operate the buses share in the system's income per bus-kilometer. A separate private contractor is in charge of ticketing and money collection, while another private company is responsible for distributing the revenues to all contractors and the municipal agency. Efforts were made to include traditional bus operators into the new system. In order to participate in the bidding process to provide and operate buses, companies must include traditional bus operators with a significant ownership share. Also, before an articulated bus is put into service it must demonstrate that its owners have bought and scrapped 7 traditional buses.

A local 25 percent tax on gasoline, of which 15 percent goes to TransMilenio infrastructure, support the system's further expansion. The national government contributes funds as well (US$1,250 million between 2000–2016) and it is promoting and now funding similar systems in other Colombian cities (Barranquilla, Bucaramanga, Cali, Medellín, and Pereira).

An important effort was made for citizens to identify TransMilenio as a completely different, high-quality transport. Its name, the buses' color, and the adjacent quality public space containing sidewalks, trees, lighting, and benches were carefully considered factors in order to make the system attractive to all socioeconomic levels. As it is much faster today to use TransMilenio than private cars, many car

owners are leaving their cars at home and using TransMilenio. Currently 11 percent of TransMilenio users are car owners.

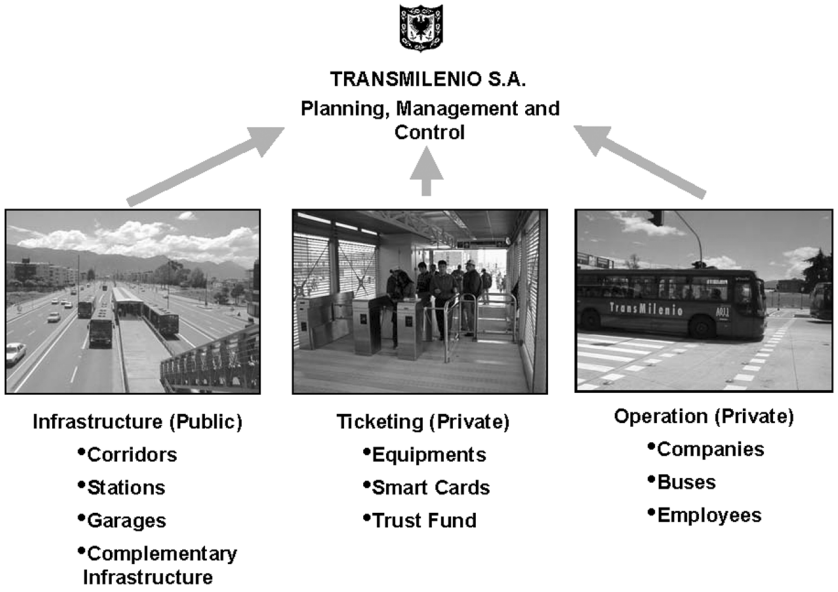
TransMilenio has been programmed to continue expanding every year until 2016 (Graph 2). By then, more than 80 percent of Bogotá's 8.5 million citizens will live less than 500 meters away from a TransMilenio line. Bicycle parking stations will begin to be created soon near TransMilenio stations so as to facilitate that modal interchange.

**GRAPH 2. Projected Bus Corridors by 2016**

**ORGANIZATIONAL STRUCTURE**

Operations are contracted with private companies with conditions set forth in concession contracts for TransMilenio bus line services or operation contracts for feeder buses (Graph 3). Private operators are consortiums of traditional local transportation companies, associated with national and international investors. Operators are selected through open bidding processes, and they are in charge of bus fleet acquisition, operation, and maintenance, and hiring drivers, mechanics, staff, etc. They are paid as a function of the kilometers served by their buses.

**GRAPH 3. System's Structure**




*THE PUBLIC ENTITY*

Transmilenio S.A., a public company created in October 1999, is the owner of the system. Its structure and staff are small—70 employees—given that it develops its charter through third parties, focusing its activity in planning the system and supervising the contracted activities. Its operation is mainly funded with 4 percent of the fare revenues, as well as ancillary activities, like renting areas for commercial advertising and providing technical assistance services.[4]

The company operates a Control Center, equipped with 6 workstations, each able to control 80 articulated buses, which allows planning and real time supervision of bus operations. Each bus has a logic unit connected with a GPS, the odometer and the door opening system. The logic unit reports the location of the bus each 6 seconds with a 2 meter precision. The control operators have a monitoring screen for each service in schematic display and a digital map for physical location of the buses. The software is able to verify schedule compliance, giving the controllers the opportunity to make demand and supply adjustments in real time.

The construction of the corridors, stations, and garages is done by the City's Institute for Urban Development (IDU). For the Phase I, the city built three bus corridors covering 41 Km, 4 terminal stations, 4 intermediate integration stations, and 53 standard stations. Additionally, the city built 30 pedestrian overpasses, plazas, and sidewalks.

Total investment was US$213 million, funded with a local fuel surcharge (46 percent), general local revenues (mainly from a capital reduction from the partially privatized power company (28 percent), a loan from the World Bank (6 percent), and grants from the national government (20 percent).

*BUS OPERATION*

The system operates with the correct number of buses to cover the demand with very efficient planning and centralized control. The system includes exclusive bus lanes (express and local) and feeder services. Express services only stop at designated stations. Local services stop at all the stations along their route. This combination allows for high capacity (buses use different stations to stop), better service to users (less stops), and better use of the bus fleet (more cycles per day). Feeder services attend to the periphery of the city, with full integration to the exclusive bus lane services.

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[4]Hidalgo, Dario. TransMilenio: "*A High Capacity-Low Cost Bus Rapid Transit System developed for Bogotá, Colombia. UITP 55th Conference, Madrid*," May 2003.

Exclusive bus lane services use low platform articulated buses with a capacity of 160 passengers and advanced characteristics: Pneumatic suspension, automatic transmission, and state-of-the-art buses (diesel or CNG). New or recent model buses are used in feeder lines, with a capacity up to 80 passengers each.

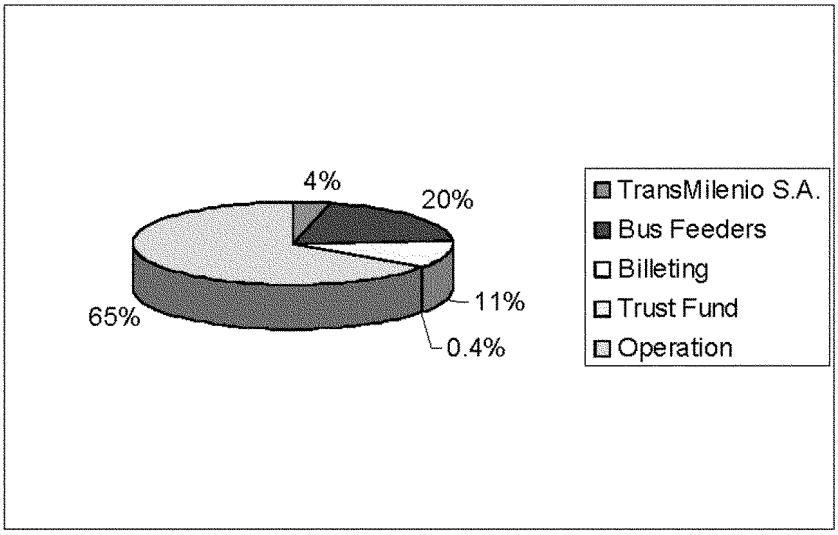
*FARE COLLECTION*

Fare collection is provided by a private concessionaire selected through an open bidding process. Money from fare collection is deposited daily in a trust fund, which is in charge of paying the system operators.[5]

TransMilenio uses a prepaid scheme. Passengers use contact-less electronic cards to access stations where they load the buses through multiple doors. The fare collection system includes producing and selling electronic cards, acquiring, installing, and maintaining equipment for access control and validation, information processing, and money handling.

The fare is US$0.36 per trip (includes feeder service and any bus change) and totally covers capital investment, operation, maintenance, and profit for the bus fleet and ticketing system operators. It also covers supervision and control of the system; administrative costs of the trust fund used to deposit the revenues; and the stations cleaning and maintenance (Graph 4).

**GRAPH 4. Revenue Distribution[6]**




**LESSONS FOR PHASE II**

Phase II (Graph 5) includes three exclusive corridors that will add 40 more kilometers, 60 stations, including 3 terminals and 3 intermediate integration stations (2 exclusive busway connections and 1 feeder-exclusive busway), 335 new articulated buses through 3 operators. Expansions will be completed in the first quarter 2005, increasing daily passengers for the whole system to 1.5 million. There are several enhancements in provided infrastructure from Phase I to Phase II, which can be summarized as follows[7]:

[5]Hidalgo, Dario. TransMilenio: A High Capacity-Low Cost Bus Rapid Transit System developed for Bogotá, Colombia. UITP 55th Conference, Madrid, May 2003.

[6]Information provided by TransMilenio S.A.

[7]Information provided by TransMilenio S.A.

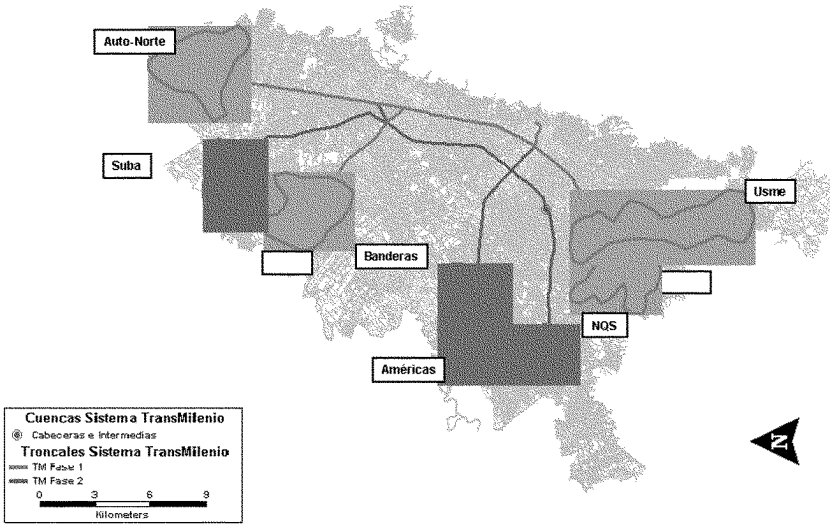
| | Phase I | Phase II |
|---|---|---|
| Design horizon | 10 year | 20 year |
| Type of contract | Mainly design-build using unitary costs | Build only at fixed total cost; includes financing for NQS and Suba corridors. |
| Coverage | One-two busway lanes, two-four general traffic lanes per direction; not always including public space. | One-two busway lanes, two-four general traffic lanes per direction; always including public space. |
| Maintenance | Not included | 5 year |
| Interchanges (bus and general traffic) | Three (simple) | Five (complex) |
| Interchanges (passengers) | None | Two including tunnels to connect stations |
| Pedestrian overpasses and public space | 27 (not always with public space provided) | 39 (always with public space for ramps) |
| Land acquisition | 300 properties (Calle 80) plus areas for terminals and depots (5 plots) | 1,200 properties |

Due to experience gained in Phase I, the need to better distribute expenses and the desire to scrap more obsolete buses, some modifications to the first phase contracts were introduced:

- Responsibility for the cleaning and safety of the new stations were assigned to new operators.
- The local authority had more participation in the system revenues.
- Incentives were given to include owners of 1 or 2 buses as shareholders of the operator companies with a minimum of 10 percent of the shares (points were awarded to those that increase the offering, resulting in 21 percent of owners participating and close to 4,000 shareholders).
- Requirement to scrap at least 6 obsolete buses before introducing a new, articulated bus was mandated (points were awarded to those that increase the offering, resulting in a 7.1 average. In Phase I, only 2.7 buses had to be scrapped).

There were also some improvements in the bus typology, including weight sensors using the bus suspension, electronic boards inside the buses for user information, among others.

**GRAPH 5. Bogotá map with TransMilenio Phase 1 and 2**




## OPERATIONAL RESULTS

By May 2003 with 41 kilometers and 470 articulated buses and 235 feeder buses in operation, the demand was 792,000 passengers/weekday. Minimum frequency was 2 minutes (peak) and maximum frequency was 6 minutes (nonpeak). In addition, there were 45 feeder services with a minimum frequency of 3 minutes (peak).[8]

TransMilenio's fare collection system has 90 selling booths, 359 turnstiles, and approximately 1,300,000 smart contact less cards. Daily revenue is around $270,000.

Commercial speeds of traditional public transit were 12 Km/h and 18 Km/h on Calle 80 and Avenida Caracas, respectively, before system implementation. These speeds have increased to 26.7 Km/h in average for the different exclusive bus lane services.

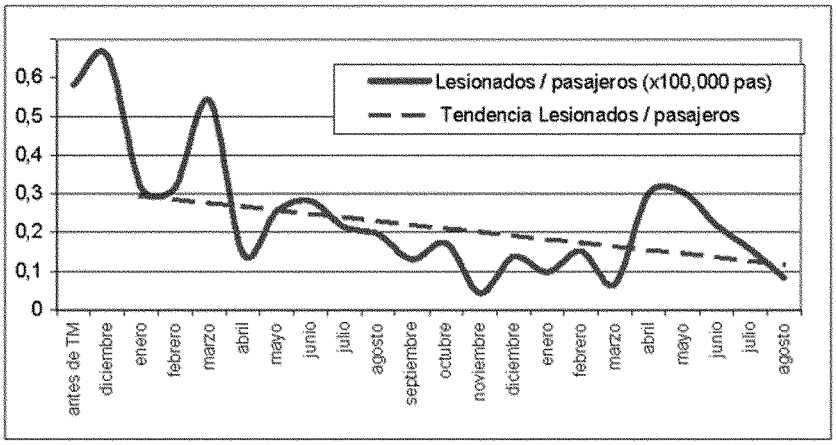
One of the most important indicators is that 11 percent of TransMilenio's riders are car owners.

## IMPACT ON CITIZENS' LIFE

A comparison before and after TransMilenio indicates an important reduction in accident and air pollution levels. The decrease in injuries due to traffic accidents in the system corridors was 89 percent for fatalities and 83 percent for injuries (Graph 6).

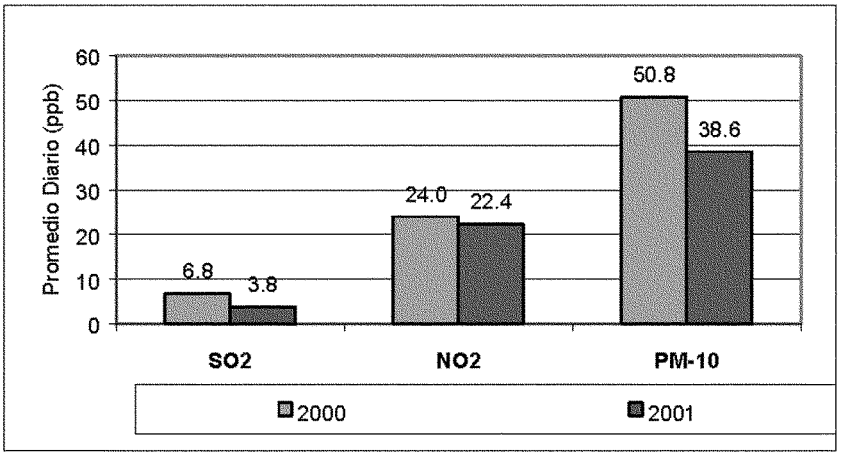
[8]Information provided by TransMilenio S.A.

**GRAPH 6. Traffic Accident Comparison[9]**




There is an important reduction in the daily averages of some pollutant levels according to a monitoring station close to Caracas Avenue corridor. Noise has been reduced by 30 percent (Graph 7).

**GRAPH 7. Air Quality Comparison[10]**




The increase in speed allows a 32 percent reduction in average trip times for the users of the system. This has been reflected in user perception of the system: 83 percent of the persons answering a poll in March 2002 indicated that fast service was the main reason for using TransMilenio and that 37 percent spends more time with their family members. Most users of TransMilenio have gained more than 300 hours per year to themselves.

TransMilenio is fully accessible for users with disabilities, elderly, youngsters, and pregnant women. About 1 percent of the users (7,500 persons per day) are among these categories of users. There are guides in the stations that provide information and support to all types of users.

The system has very high acceptance levels as a result of the very strict standards required to build the infrastructure and to operate the articulated and feeder buses. The satisfaction poll in April 2002 showed that 78 percent of the respondents rate the system as being good or very good.

[9]Information provided by Bogota's Department of Transit and Traffic and Metropolitan Police Department.

[10]Information provided by Bogotá's Department of Environment (DAMA).

The satisfaction poll in April 2002 showed that 78 percent of the respondents rate the system as being good or very good.

**CONCLUSIONS**

TransMilenio is part of a structural change to the transport systems in Bogotá. The first 30 months of operation demonstrate the great possibilities for this system to provide efficient and high quality mass transportation at a very low cost for the users and the government. It also shows that it is possible to introduce innovative private participation mechanisms, particularly from traditional private providers, under conditions that ensure sustainability and profitability of the service.

Project implementation was very fast. The project changed from a well-defined but general idea to commissioning in 36 months with Phase I being completed in a total of 48 months. This was possible thanks to a strong political will, adequate financial support for infrastructure development, and a lot of work from a committed and enthusiastic technical team.

A learning process has been applied in the system expansion: Better infrastructure with innovative financing mechanisms; more participation of the city administration in the system revenues with a transfer of some responsibilities; inclusion of displaced bus owners; better environmental standards; new operators of bus lines and fare collection systems, among others. The system expansion shows that the provision of a high quality transit system at a low cost is a continuous process. The expansion is expected to continue, due to the high acceptance levels by the users and the population at large and its ability to provide reduction in travel time, accidents, and pollution.

Mr. Chairman, from my own experience in Bogotá and with all respect I recommend the reauthorization of the Federal Transit program including the support of BRT systems in the United States and would like to finish my intervention telling that from beginning with an extremely negative self-image, Bogotá went to become a city with a sense of belonging and confidence in a better future thanks to the implementation of a different city model and particularly the TransMilenio. It comes from successful experiences elsewhere, an appraisal of our differences and aspirations, and a realistic look at our possibilities. Our proposed model is neither technologically sophisticated, nor economically demanding. It requires however political decisions aimed at truly making public good prevail.

Thank you again and I will be pleased to answer the questions you might have.

**ATTACHMENTS**

*BOGOTÁ FACTS*[11]

Bogotá is the Capital and most important city in Colombia. It has 7 million inhabitants, 15.2 percent of the nations total. Population grows 2.5 percent annually and most of its people are young adults: 62 percent of the total are among 15 and 54 years old. The city is 8,500 feet above sea level, in the highest plateau of the Colombian Andes. The city covers an area of 32,000 ha and has a high density: 210 inhabitants per hectare. Most of its urban area is flat, with some informal development in the hilly areas in the southern part of the city.

The most relevant characteristics of transportation in Bogotá in 1988 were: Slowness (average trip was 1 hour and 10 minutes long); inefficiency (routes were 30 Km on average, with buses 14 years old on average and 45 percent mean occupancy rate); inequity (95 percent of available road space used by private vehicles moving 19 percent of motorized trips); contaminating (70 percent of particles released to the atmosphere come from mobile sources; 1,200 deaths per year resulting from pneumonia associated with air pollution); and unsafe (52,764 reported accidents in 1998, resulting in 1,174 deaths).

To initiate a structural change in transportation conditions, Enrique Peñalosa's administration set forth an integral mobility strategy with actions to promote nonmotorized transportation (recovery and construction of public pedestrian spaces, building a 300 Km bikeways network); reduce automobile use (city wide vehicle restriction using license plate numbers in peak periods, increase in parking prices, Car Free Days, among others), and development of a Bus Rapid Transit system (TransMilenio).

[11]Hidalgo, Dario. TransMilenio: A High Capacity-Low Cost Bus Rapid Transit System developed for Bogotá, Colombia. UITP 55th Conference, Madrid, May 2003.

## PREPARED STATEMENT OF ANNE CANBY

PRESIDENT, SURFACE TRANSPORTATION POLICY PROJECT

JUNE 24, 2003

Mr. Chairman, I am Anne Canby, President of the Surface Transportation Policy Project. I am very pleased to appear today to present testimony on behalf of the Surface Transportation Policy Project on "Bus Rapid Transit and Other Bus Service Innovations."

The Surface Transportation Policy Project or STPP is a nationwide network of hundreds of organizations, including planners, community development organizations, and advocacy groups that are devoted to improving the Nation's transportation system.

I am pleased to have this opportunity to discuss BRT, enhanced bus services, and related issues as this Committee prepares legislation to reauthorize TEA–21.

### Overview

First of all, I would like to recognize the Members of this Committee for your strong commitment to public transportation. The record of success shows that public transit has been a good investment. Clearly, the certainty of funding and the stability of the program structure that you provided in TEA–21 made a difference.

The Nation has achieved transit ridership levels last seen in the early 1960's. Over the last several years, the growth in transit use has outpaced driving and air travel. We believe that we are positioned for even greater gains in the TEA–21 renewal period if we can "stay the course" and reaffirm the principles that made these gains possible.

There is more good news about public transit and its successes under TEA–21. State and local elected officials, business and community leaders, and the public are embracing public transit in ever greater numbers. Virtually every public opinion survey that has been conducted over the last several years shows unprecedented support for increased transit investment and improved transit services.

This hearing reviews what the new law can do to stimulate investment in Bus Rapid Transit and enhanced bus services. We encourage this Committee to make the necessary adjustments to current law to help support the broader deployment of these services, which we see as part of the effort to expand transit use in the United States.

### Investment in BRT and Enhanced Bus Services

Mr. Chairman, STPP would like to offer several recommendations to guide this Committee's work as you make adjustments in current law to give transit providers additional tools to support their efforts to provide a more robust and richer array of transit services.

First, we recommend that the current program structure be preserved and that some simple adjustments to current law be made to support transit providers as they pursue the full range of BRT and enhanced bus service investments.

Second, we recommend that the "New Starts" program continue to focus on fixed guideway projects, including BRT that meets the program's more rigorous standards and criteria. Clearly, this program is already substantially oversubscribed; the Administration's proposal to expand the types of projects (e.g., less than full BRT) eligible for New Starts funding would be counterproductive and extend further the already unreasonable time for new start funding.

Third, we recommend that the current bus discretionary program be continued and adapted to allow for multiyear grant agreements for BRT projects that fail to meet the New Starts criteria, as well as for enhanced bus projects that meet certain threshold criteria. It is certain that current program eligibilities will have to be reviewed and may have to be adjusted. But we believe that providing for multiyear grant commitments in the bus discretionary program is where the Committee can make a real difference for transit providers that want to pursue these strategies.

Fourth, we recommend that the Federal Transit Administration develop a process that would support its efforts to make annual recommendations to Congress on candidate projects within the bus discretionary program where multiyear grant commitments be considered.

Fifth, we recommend that specific criteria be developed to guide FTA in making recommendations to Congress on potential projects that should receive consideration for multiyear commitments as part in annual appropriations bills. Presumably, a transit provider would have to make some showing or demonstration as to why a multiyear commitment is necessary. Beyond this threshold, criteria could be developed to qualify and rank projects for multiyear commitments, and these might include consideration of the use of alternative fueled vehicles, deployment of clean

emission vehicles or new technologies, timely compliance with applicable clean air standards, extraordinary expansion of system capacity or service levels, role in the investment in furthering adopted land use plans and corridor redevelopment plans, enhancement of previous investments in surface transportation infrastructure (that is highway capacity and transit facilities), leverage of other public and private investment particularly transit-oriented development, or expanded evacuation capacities.

Finally, we recommend that the level playing field within the transit program categories and between transit and highway capital projects be retained at the current 80/20 matching ratio. This is a core principle that was established first in 1991 with the enactment of ISTEA and it should be preserved.

**Other Program Considerations**

Mr. Chairman, as we examine ways to promote BRT and other enhanced bus services, I wanted to call out some of the overriding issues that will challenge transit providers and their efforts to grow bus systems and services over the next renewal period.

First, *continuation of the guaranteed funding features of TEA–21* is absolutely crucial to sustained investment in public transit infrastructure and services. The dominant theme of all of the hearings on TEA–21 has been that guaranteed funding was the single most important policy change from ISTEA to TEA–21, underpinning the success of the last 6 years.

STPP along with many of our partners and others have been concerned with proposals that threaten the strong commitments made in TEA–21. The Administration's SAFETEA plan leaves a portion of the transit program outside the budgetary firewalls and spending guarantees, targeting "New Starts" funding, the one program area where certainty is most crucial. This program supports what are often the largest and most significant capital projects undertaken by transit providers. And it has been the New Starts program, as well as rail transit use overall that have been driving the growth in transit ridership over the last several years.

We are particularly alarmed about proposals in Congress that threaten to destabilize future Federal commitments to public transit, by eliminating a substantial portion of the dedicated fuel taxes to the Mass Transit Account and replacing these certain revenues with the uncertain proceeds of a new Federal bonding program.

Mr. Chairman, STPP and its many partner organizations strongly oppose this proposal for funding future transit investment in this manner, and we applaud your leadership and others on this Committee for stepping forward to oppose this approach. This proposal simply ignores what we have learned about the role of certain funding in further enhancing our Nation's surface transportation systems.

Second, system ownership influences choices and the allocation of transportation resources, and these considerations are particularly important to this Committee's review of BRT and enhanced bus services. What makes nonfixed guideway BRT systems and enhanced bus services appear so much more economical and affordable is the fact that these projects are tapping the value of existing highway and road networks that in almost all cases are owned and managed by agencies other than the transit provider. Getting the incentives and eligibilities right within the FTA programs is only one part of the equation. The other part of the equation is how to get the facility owners engaged in helping make these projects happen.

Transit providers, which are overwhelmingly regional agencies, must partner with State transportation departments, county and city governments (i.e., the owners and operators of the Nation's road and street networks) to get the improvements that will be needed to make these new services possible. BRT and other enhanced bus projects rely on technological changes in traffic signalization and other operational changes and most likely some reengineering of the facilities, which are likely to be freeways or principal arterials. While separate guideway systems are expensive, leading to growing interest in some of the approaches being discussed here today, one must recognize that lesser BRT and enhanced bus projects will rely on facilities that are part of the National Highway System and more often part of the Federal-aid system. There are real challenges here that should be considered.

How highway dollars are allocated within the States is another important policy consideration. Under TEA–21, almost all highway funds are distributed to the States regardless of how much of the highway and street networks they own and operate, with about 6 cents of every State dollar reserved for local decisionmakers in the larger urbanized areas (i.e., areas of 200,000 or more in population). As local areas look for resources to provide safer access to transit facilities for pedestrians and bicyclists, make other road improvements to support BRT or enhanced bus services, or use the Act's flexibility to move TEA–21 highway dollars directly into transit

projects, the record shows us that most Federal highway funds rarely reach local decisionmakers to make these choices.

This has led STPP to call for an increase in the allocation of Federal highway dollars to local officials in their Metropolitan Planning Organizations (MPO's), raising direct commitments to local decisionmakers beyond the 6 cents on every dollar that current law now provides. In this way, we can better align land use powers and facility ownership with resources, key ingredients to making progress with these approaches. While this issue is squarely before the Senate Environment and Public Works Committee, it is an important consideration in moving forward on the issues being discussed here today.

Finally, *stimulating private sector engagement* is an important consideration in making BRT and enhanced bus services more viable. One of the most important developments in public transportation is the changing attitudes of the private sector about the value of transit services and how the availability of broader mobility choices for people and businesses is reshaping development markets all across the country. Investors and developers are beginning to rediscover the many market opportunities that exist in places with substantial transit investments, most often seen in places with heavy and light rail systems.

We do not yet have enough experience with the BRT and enhanced bus services to know what is needed to motivate private sector investment. We do know that the appeal of these rail transit systems is their permanence and accompanying expectations that services will be high quality and enduring. The record on nonfixed guideway systems, including enhanced bus, is less conclusive. Examples outside the United States are not readily transferable here, given the externalities that exist elsewhere (e.g., housing policies, high gas prices, lower car ownership, history of transit use, and more centralized government planning, etc.). This is the right time to be seeking to expand the BRT and enhanced bus services as developers and investors increasingly look to locations with mobility options beyond simply private automobiles.

This is one area where this Committee can look for additional ways to accelerate private sector engagement in TOD and transit more broadly. This Committee shapes housing policy, community and neighborhood development programs and financing tools, certain banking functions, including CRA requirements, and the like. We certainly believe that some of these tools should be examined and adjusted to help stimulate more investment in and around transit services, be it rail transit, BRT or corridors served by enhanced bus services.

**Transit Investment and Land Use and Development**

Mr. Chairman, among the issues before this Committee is an examination of how transit investments can contribute to land use and community development. We do not yet have enough information to assess how nonfixed guideway BRT and enhanced bus services can influence these issues. However, I did want to cite several examples from this Committee's hearing record on how transit investment can influence these outcomes, noting particularly rail transit projects which have recently opened or where new projects are under development.

Last year in hearings before the Subcommittee on Housing and Transportation, Dallas County, TX, Commissioner Kenneth Mayfield recounted the many economic development benefits from his region's light rail system, citing the many millions of dollars in private investment that was stimulated by the opening and subsequent expansion of the DART system. A recent study looked at valuations and the economic impact on properties of proximity to DART stations. "Between 1997 and 2001, the mean value of 47 office properties near DART increased 24.7 percent, compared with an average increase of 11.5 percent for properties not near the stations, giving the DART office buildings a 53 percent advantage." (Bernard Weinstein and Terry Clower, "DART Light Rail's Effect on Taxable Property Valuations and Transit-Oriented Development, Denton, TX: University of North Texas Center for Economic Development and Research, January 2003, at *http://www.dart.org*)

In Hank Dittmar's testimony before the Subcommittee on Housing and Transportation last year, he cited a recent study by the University of North Texas found that the new DART system in the Dallas region has already generated over $800 million in development, and that the full system is projected to generate $3.7 billion in economic activity upon build out. (University of North Texas, 2000)

Charlotte Mayor Patrick McCrory has talked about the economic impact that his region's proposed rail plan was already having on the city along the planned corridors to be served by rail transit, trolleys, and BRT service. Thousands of downtown housing units are under construction or have been constructed in anticipation of the area's transit investment, as well as the reuse of many abandoned brown-

fields and underutilized land and buildings, particularly those along the route of what will be a restored streetcar line.

What is particularly so powerful about the Charlotte example is that the local elected officials working in a regional context have interlocked their land use and development planning with their long-term transit plan. Over a 25-year period, the transit plan calls for 23 miles of BRT busways, 21 miles of light rail service, 11 miles of streetcar service, 29 miles of commuter rail service, 60–70 stations with transit oriented development opportunities, and a 520-bus fleet to provide rapid transit service throughout the metro area. A strong commitment to planning and land use, while key elements of their initial success, is further supported by the region's rapid growth and strong backing from its substantial banking and financial community that understands the value of the transit investments that are being made.

Looking to an example of an earlier transit investment, Mr. Dittmar also talked about the Washington, DC area and discussed a case study that he was compiling on Arlington County and development activity along the Roslyn-Ballston Corridor. "Development along this corridor has allowed Arlington County to capture over 13 million square feet of office space and 2 million square feet of retail since 1980. The corridor has increased in population from 19,838 in 1980 to 34,485 in 2000, reversing a steep population decline in the 1970's. Land value within the corridor near the four stations increased by 81 percent from 1992–20002, an average annual increase of 6.1 percent, generating over $109 million in property taxes in 2002 alone. The corridor generates approximately 33 percent of the County's real estate tax on 7.7 percent of the County's land. According to the study, "Even with the economic downturn and the residual affects of the 9/11 incident (which affected Arlington directly through the bombing of the Pentagon and the subsequent shut down of National Airport and several major arterials), February 2002 vacancy rates were at 10 percent. This is half of the vacancy rate of suburban office concentrations in outlying Virginia such as Tyson's Corner and Reston. The office rents in the Roslyn-Ballston Corridor also command a rent premium over other office locations in the Northern Virginia marketplace." (TransManagement, Inc. for Great American Station Foundation, forthcoming)

**Closing Comments**

Mr. Chairman, I want to close my comments by recognizing the considerable progress that has been made in increasing the use of public transit through the Nation and again commend this Committee for their strong support of these efforts.

Much of the success that public transit has enjoyed over the last several years is a result of the leadership that this Committee has provided on these issues. The hearing today and the focus on policies that will help promote the increased use of BRT and enhanced bus services will help ensure that we continue to expand on the successes that the continuing Federal commitments have helped support.

Thank you for the opportunity to appear before you today.

**RESPONSE TO WRITTEN QUESTIONS OF SENATOR SARBANES FROM JAYETTA HECKER**

**Q.1.** In your comparison of capital costs for light rail and BRT, did you spread those costs over the useful life of the assets? Since the useful life of light rail and BRT assets differs, would not an appropriate comparison require life-cycle costs to be considered?

**A.1.** Our analysis was not a life-cycle cost projection. Life-cycle cost analyses require detailed data on the individual elements of a project and assumptions regarding their use. The data we were able to obtain did not have the necessary level of detail, and assumptions regarding the lifetime use of the assets would have added a level of uncertainty to the analysis. Instead, we chose to determine the actual cost to complete projects. Also, we do not believe that life-cycle cost analysis would change our overall conclusion that Bus Rapid Transit generally had lower capital, costs, given the magnitude of the cost differences between Bus Rapid Transit systems and light rail systems.

In our September 2001 report, we present information describing the capital cost to complete 41 light rail and Bus Rapid Transit projects opened since 1980. To determine the capital costs, we obtained cost data from the FTA and transit agencies for selected cities. For Bus Rapid Transit systems, we identified 20 existing Bus Rapid Transit systems or operated dedicated busways in 10 cities. For Light Rail, we identified 21 systems in 13 cities that were built between 1980 and 2000. We limited systems to this timeframe due to the concerns about the availability of data from earlier dates. To obtain capital costs for the Bus Rapid Transit systems, we used prior reports, if available, or contacted the local transit agency. For the light rail projects, FTA and transit agency officials provided total capital costs. We then escalated the capital costs to 2000 dollars to provide a more accurate basis of comparison. To escalate the costs, we used the Gross Domestic Product Implicit Price Deflator applied to lump-sum capital cost at the year of completion. The only exception to this method was for the San Diego Light Rail system. Due to the way in which this system was built over time, the transit agency provide us annual capital expenditures, and we escalated each of these to 2000 dollars to determine the capital cost of this system.

While life-cycle cost projections are a valuable tool in helping to decide which type of project to pursue or in helping to choose a particular type of assets to purchase, we did not perform such an analysis for the 41 systems. To do so, we would have needed to obtain itemized information on all assets of the systems that were built and their expected life. Assumptions would have been required about the life of each asset, which in turn could be dependent on many factors, including the particular asset purchased, the expected maintenance that would be performed to extend its life, and the expected use of the asset. We decided that it was better to present the actual costs incurred to complete the transit projects. In addition, we did not do life-cycle cost projections because sufficiently detailed information was not likely to be available for many systems. Without the necessary level of detail, the life-cycle costing could not be done. We had difficulty obtaining actual total cost expended for projects and to have required that localities provide

a breakdown of the actual cost of each asset would likely have resulted in dropping many cases from the analysis, severely limiting our study.

However, given the magnitude of the difference in the actual costs to construct light rail and various Bus Rapid Transit alternatives, we do not believe a life-cycle cost analysis would change our overall conclusion that the capital costs for Bus Rapid Transit are lower than for light rail. At the "low" end, in our review Bus Rapid Transit on arterial streets had a cost (in 2000 dollars) of about $680,000 per mile, while light rail cost was about $34.8 million per mile. Thus, the cost per mile of Light Rail was over 50 times greater than the cost per mile of this type of Bus Rapid Transit. We believe this is too large a difference for life-cycle cost factors to reverse. In addition, higher cost Bus Rapid Transit systems such as busways, which averaged about $13.5 million per mile in our study, also contain many long-lived high-cost elements such as dedicated right-of-way, stations, bridges, and tunnels. We would expect such bus facilities to have useful lives similar to light rail right-of-way, stations, bridges, and tunnels. The useful life of these facilities would have to be less than half that of light rail facilities to overcome the initial capital cost advantage of busways. In addition, the capital cost of a project includes many one-time cost elements such as environmental clearances or "soft costs" such as design and engineering, project management and oversight, and debt financing. It is not apparent how these elements could favor either light rail or busway alternatives in a life-cycle analysis. Vehicle costs are an area where light rail could have a life-cycle cost advantage over bus-based systems. Rail vehicles have a longer useful life than buses. As we noted in our September 2001 report, light rail vehicles cost about $2.5 million, while bus costs varied between $283,000 and $1.5 million at that time, depending on the bus size and technology. Depending on the number and type of buses needed, and their specific useful life, the overall life-cycle costs of the bus system could rise, relative to light rail. However, vehicle costs may only be a relatively small portion of the overall cost of a major transit project. For example, a 1995 study performed for FTA estimated the proportion, or "weight" of vehicle costs for light rail projects to be about 14 percent of total capital costs.

**Q.2.a.** Your testimony notes that Los Angeles and Houston both had exclusive bus lanes at one time, which were later converted into HOV lanes. Why was that done?

**A.2.a.** The El Monte (I–10) busway in Los Angeles was opened for bus-only use in January 1973. Under the original agreement between the Los Angeles County Metropolitan Transportation Authority and Caltrans, a 5-year experimental period was established. During the first 2-year phase the facility was to operate as an exclusive busway; in the next 3-year phase the facility was to operate with mixed bus and carpool use for at least one year. In August 1974, it was temporarily opened to three-person carpools and vanpools in response to a Southern California Rapid Transit District strike. It returned to bus-only operations in October 1974, when the strike was settled. According to an FTA study by the Texas Transportation Institute, by 1976, the busway was carrying about

3,000 passengers on 64 buses during its peak hour of operation. That same year the busway was again opened to mixed-mode operations, allowing 3 or more passenger carpools. In 1999, the California Legislature lowered the vehicle-occupancy requirement from 3 or more passengers to 2 or more, mandating a demonstration period from January 1, 2000 to June 30, 2001. Following the initial results of the demonstration, new legislation moved the vehicle passenger requirement back to 3 or more passengers during the morning and afternoon peaks and maintained 2 or more passengers at other times, effective July 24, 2000.

The Houston I–10W Katy bus transitway, which opened in 1984, is available and was originally restricted to bus and authorized van pools. According to a 1995 study for FTA, after 6 months in the Katy transitway's first year of use, 271 vehicles per day used the facility—101 buses and 170 vanpools carrying a total of 5,046 passengers. Even though the vehicles carried more people than any of the adjacent passenger lanes, the transit way looked empty and appeared underutilized at the end of the first year. According to the FTA study, motorists in the congested adjacent lanes demanded access to the bus transitway. Initially, the transitway opened the lane to carpools with 4 or more passengers, but according to the study, only six such carpools used the facility during the average morning peak period. In 1985, carpools with 3 or more passengers were allowed to use the lanes. Later, because of the continuing perception that the lane was underutilized, the lanes were opened to all carpools with 2 or more passengers in 1987.

**Q.2.b.** Were there any follow-up studies done to determine the impact on the bus service of allowing private automobiles to use the bus lanes?

**A.2.b.** According to a 2002 FTA sponsored Texas Transportation Institute study, changing the HOV requirements on Los Angeles' El Monte (I–10) busway had significant negative impacts on bus service. For example, temporarily changing the HOV lane requirement from 3 to 2 or more passengers in 2000 lengthened the peak hour travel times from 20 to 30 minutes, and reduced operating speeds on the busway as much as from 65 mph to 20 mph. Hourly busway vehicle volumes during the morning peak hours rose from about 1,100 to 1,600, but the number of persons carried declined from about 5,900 to 5,200. Bus schedule adherence and on-time performance also declined significantly as a result of lower operating speeds. However, the study does not cite negative effects from the initial change from exclusive busway to mixed bus and 3 passenger HOV use.

According to a 1995 study for the FTA, opening Houston's Katy bus transitway to 2 or more person vehicles in May 1986 dramatically increased the number of vehicles using the lanes during the morning peak hours. Under a 3 person HOV requirement, the transitway on average carried 148 vehicles per hour (35 buses, 41 van-pools, and 72 carpools); when the 2 person requirement was instituted, about 1,450 vehicles per hour used the transitway. The increase in usage during the morning rush hour caused average transit speeds to decline from 55 mph to 45 mph or below.

**Q.2.c.** If Federal funds are used to invest in those lanes, what guarantee do we have that those lanes will not be converted later into general traffic lanes, potentially undermining the purpose for which the Federal investment was made?

**A.2.c.** Conversion of HOV lanes built with Federal funds to general-purpose lanes may or may not be prohibited, depending on the circumstances; however Federal reviews and approvals would have to occur before such a conversion may take place.

The FTA does not have published guidance on the conversion of bus lanes to different operational uses. However, according to the FTA officials, for FTA New Starts projects limitations on changes should be covered in the full funding grant agreement. The grant agreement specifies what changes, if any, may be made without FTA approval. This would apply not only to conversion of bus lanes to general-purpose lanes, but also conversion of bus lanes to HOV or High Occupancy Toll (HOT) lanes. FTA would consider the potential negative impact on transit operations of any change in the status of a FTA-funded facility. In addition, FTA would need to ensure that changes in the use of the lanes were consistent with the local long-range plans developed by the local Metropolitan Planning Organization.

If Federal-aid Highway funds are used to fund to construction of HOV lanes, Federal Highway Administration guidance applies. This guidance states that in accepting Federal-aid funds, agencies agree to manage, operate, and maintain HOV lanes as they were originally planned, designed, constructed, and approved. A proposal to convert an HOV lane to a general-purpose lane is considered a significant operational change requiring a further Federal review. This review is needed to assure consistency with the existing law, including commitments made as a result of the National Environmental Policy Act (NEPA), planning requirements and transportation conformity requirements under the Clean Air Act, and commitments in project agreements.

## RESPONSE TO WRITTEN QUESTIONS OF SENATOR SARBANES FROM KENNETH P. HAMM

**Q.1.** Mr. Hamm, you state in your testimony that you would like to see a "simpler process than currently exists for New Starts." What do you see as the major complications involved in the current process? Do you have any suggestions for how to achieve a simpler process?

**A.1.** Lane Transit District has not been through the New Starts process and therefore may not be in the best position to describe how it could be modified. However, staff have participated in the numerous Federal Transit Administration (FTA) New Starts trainings, and believe that the New Starts criteria must be modified (made simpler) for Small Starts projects.

*New Starts Criteria*

- The incremental cost per new rider could be based on the project's No-Build Alternative—not a transportation system management or *Baseline* alternative, typically used for New Starts projects.

- The land use narrative would not need quantitative land use data. A descriptive narrative addressing the links between existing land use and development and the proposed project would be sufficient.
- The Small Starts projects would be exempt from the transportation and transit User Benefit measures.
- Small Starts projects would be exempt from the FTA Summit reporting requirements.

The source at information for the Small Starts report would be the project's environmental impact statement or environmental assessment. FTA would continue to rate projects using the modified criteria. Certification of assumptions and methods would be conducted through a self-certification and local peer review process (see the project management oversight function described below).

The rating process would be conducted at only one point in time (instead of three): When the project seeks approval to advance from preliminary engineering into final design and construction. The absence of other New Starts criteria, measures, and ratings could not be used by the FTA to assign a lower rating to the project; deny a project's advancement into subsequent phases of development, except as provided in the proposal; exclude the project from the Administration's proposed annual budget; or exclude a project from consideration of a full-funding grant agreement.

*Project Management Oversight*

The project management oversight (PMO) requirements were implemented by Congress and FTA to ensure that Federal funds are used appropriately by the project sponsor. The following proposal would provide for a streamlined program designed to meet those same objectives, but utilizing a self-certification and peer review process with a limited number of reporting points.

- Small Starts projects should be required to implement a project management oversight process that is based on self-certification and a locally-implemented peer review process. The peer review process would be initiated at the start of preliminary engineering, with reports made to FTA at the conclusion of preliminary engineering, final design, and construction. The reports would address the financial capacity and technical capability of the project sponsor to undertake the project's next phase of development similar to the existing PMO process. The peer review panel would meet to consider and comment on the project management reports prepared by the project sponsor and the panel would forward its comments on the report to FTA. The specific issues to be addressed in the project management reports would be agreed upon between the project sponsor and the peer review panel at the start of preliminary engineering. The peer review panel would be supported by an independent staff consultant.

Alternately, FTA could contract with a project management oversight consultant during final design and construction, which would be in addition to the peer review process outlined in the preferred proposal. Reporting and meeting requirements would focus primarily on the reports and meetings prepared and conducted through the peer review process. The consultant would prepare

independent reports to FTA in tandem with the reports prepared by the project sponsor and the peer review panel.

*General Performance and Results Act of 1993*

The Federal Transit Administration has interpreted the GPRA to require a Before and After Study, requiring extensive data collection. Ideally, a Small Starts project could be exempt from the GPRA and thus exempt from the FTA requirement for Before and After Studies. Alternately, a Small Starts project could be required to prepare a report at the conclusion of construction that would address differences and similarities between the project that emerged from final design and the project that actually was constructed, including compliance with the project's budget. The report would be included within the peer review process (and could be reviewed and commented on by the PMO consultant) and would replace the Before and After Study requirement.

**RESPONSE TO WRITTEN QUESTIONS OF SENATOR SARBANES FROM OSCAR EDMUNDO DIAZ**

**Q.1.** Mr. Diaz, thank you very much for your testimony regarding the TransMilenio system operating in Bogotá, which sounds like an extraordinary success. In your statement, you mentioned that the investment cost for the TransMilenio Bus Rapid Transit system was $5 million per kilometer, *excluding* vehicle acquisition costs. When these costs are taken into consideration, what was the total initial investment per kilometer? Also, in developing your project cost comparison, did you take into account any possible socio-economic factors that may differ between the United States and Colombia, such labor rates, private automobile ownership, environmental regulations, land acquisition costs, or other factor?

**A.1.** Senator Sarbanes, regarding your first question, the cost of the TransMilenio system per kilometer was $5 million. This amount does not include vehicle acquisition since the buses were bought by private operators. TransMilenio *is a public-private partnership.* TransMilenio S.A., the local municipal agency manages bidding processes and controls the system operation. Private contractors who operate the buses share in the system's income per bus-kilometer. A separate private contractor is in charge of ticketing and money collection, while another private company is responsible for distributing the revenues to all contractors and the municipal agency.

However, we have made some calculations for each $2 there is $1 investment from the private sector, that includes, vehicle acquisitions—trunk line articulated buses and feeder buses, workshops, equipment, and ticketing. So, that, the total cost would be $7.5 million per kilometer, $5 million public and $2.5 private.

Regarding the second question, yes, we took into account socioeconomic factors to develop TransMilenio. The old system was chaotic and drivers worked for more than 14 hours a day without health insurance or a pension plan. In TransMilenio drivers work 8 hours a day and have health insurance and the normal compensations. This gave them dignity and changes the way they respond to their job.

There is no doubt that in the United States' cities, car ownership is higher than in any other Latin American city. However, as we have fewer cars, we have much less car infrastructure than U.S. cities. Then the excessive number of cars is also a problem in Bogotá. The situation we found was basically to choose between building more infrastructure for cars and solve their traffic jams or invest in a new public transport system for the majority and also to attract car owners. As mentioned in my testimony, 11 percent of current TransMilenio riders are car owners, it seems to be low, but this is only with the first 40 kilometers of a total of 388. But to reduce car usage TransMilenio is not enough. We implemented several other measures to this purpose such as *Pico y Placa,* non-motorized transport infrastructure, increase on gasoline tax, car free days, and a referendum.

*Pico y Placa* is a license-plate-number-based system in which 40 percent of all cars in Bogotá are off the streets during 2 peak hours in the morning (7:00–9:00) and 2 peak hours in the afternoon (5:30–7:30). Each car has this peak hour restriction twice a week. The scheme reduced trip times by about 29 minutes and lowered pollution levels. Gas consumption went down 10 percent. Other cities have implemented full day tag-number-based restrictions without much success. For one, a whole day restriction is so severe, that many who definitely need to use a car find ways to get special permits. And of course once a special permit is issued, many want to get one as well. And soon after half the population has one. Another problem with whole day restrictions is that many people buy an additional car making things even worse. The Bogotá restriction is less severe and more effective. Some people leave the car home, which is the socially desirable behavior. Others simply go to work earlier or later than usual and thus road space is more evenly allocated. This restriction functions well and has a higher than 90 percent popular support.

In Bogotá, we developed a large bicycle-path network and set in the planning bylaws that future roads must include bicycle-paths alongside them. In Bogotá, bicycle paths are physically isolated from motor-vehicle traffic. More than 300 kilometers of bicycle ways were built in 3 years. People riding to work increased from 0.3 percent to 4.4 percent of population.

A local tax on gasoline was increased to 25 percent, of which 15 percentage points go to TransMilenio infrastructure, support the system's further expansion.

Bogotá also has a car free day at least once a year since 2000. Differently from car free days elsewhere, it is held on a weekday and covers the whole city and not just a few arteries or sectors. During 13 hours all citizens (8 million) meet as equals in public transport, bicycles, or walking. In a referendum held afterwards, in October 2000, nearly 64 percent of voters approved establishing a car free day the first Thursday of February every year. In the same referendum the people of Bogotá voted positively to get all cars off the streets every weekday between 6 a.m. and 9 a.m. and between 4:30 p.m. and 7:30 p.m. from January 2015 onwards. This is a powerful resolution. It was decided to implement the measure only in 2015 in order to allow time to put in place a quality public trans-

port. But only another Referendum could change the decision of the people of Bogotá.

The buses use clean diesel EURO II technology. In the corridors where TransMilenio runs there has been an important reduction in the daily averages of some pollutant levels, such as SO2, NO2, and PM–10.

In order to build some of the corridors, workshops, stations, and pedestrian bridges, in some areas it was necessary to buy land around the system. In some cases the city had to use the eminent domain in order to acquire the land for the benefit of the majority. This measure has been applied all over the world to build car infrastructure, then why not use it to build a public mass transportation system?

**RESPONSE TO WRITTEN QUESTIONS OF SENATOR SARBANES FROM ANNE CANBY**

**Q.1.** Do you believe that fixed guideway investments, whether rail or BRT, may have an advantage over nonfixed guideway investments in helping communities restrain urban sprawl by focusing development around transit stations? As you understand it, does the FTA's New Starts rating process fully capture this long-term economic development potential when evaluating the costs and benefits of a proposed system? If not, and if nonfixed guideways were allowed to compete for New Starts funding, might this create a potential bias toward nonfixed guideway investments by undervaluing the benefits from a fixed guideway alternative?

**A.1.** Fixed guideway investments are much more attractive for real estate development than nonfixed-route transit. Much of the economic development that happens around a transit stop depends on the station being a long-term installation. A transit-oriented developer depends on the certainty provided by the permanence of fixed guideway (similar to a road) and factors the increase in market value associated with greater mobility and mode choice into project feasibility calculations. The risks posed by bus service operating on the local street network that could be terminated at any point or relocated to another corridor are far less attractive to a developer than a fixed guideway investment.

The current New Starts rating process as specified by the FTA does not quantify the extent to which economic development will be spurred through the transit project. In the crucial numerical benefit measurements—the capital and operating funding plans and the cost-effectiveness rating of different alternatives—economic development is not included. It is included as a qualitative consideration, but will not count as one of the fiscal benefits.

Although FTA does not rate projects purely according to the numerical benefit calculations, the agency has expressed the fact that many participants in the process understand the cost-effectiveness rating to be a make-or-break factor.

> . . . FTA is aware that the cost-effectiveness measure is often interpreted by project sponsors, State and local decisionmakers, and even elsewhere within the Executive and Legislative branches of the Federal Government as "the" measure that will "make or break" a proposed new start. (p. 76873, 65 FR no. 236)

This means that the project justification rating, one of two that factor into the final rating, is significantly biased by the cost-effectiveness figure, a number that excludes consideration of economic development benefits. This seems to miss one of the main attributes for fixed guideway New Starts.

We strongly recommend to the Committee that some fixed guideway criteria be retained in the eligibility for New Starts funds, and that this criteria be further defined for BRT projects so that at least 60 percent of the route must be fixed in order for a bus improvement to qualify as a Bus Rapid Transit project.

**Q.2.** In your testimony, you suggest that in order to encourage development of BRT projects, no major structural changes are needed in the current Federal programs, but that "some simple adjustments" could be made to current law. What kind of adjustments did you have in mind?

**A.2.** We recommend to the Committee that fixed-route BRT be allowed under the New Starts criteria. However, nonfixed-route BRT with less than a certain share of fixed route should also be eligible for multiyear commitments. The projects which fall into this latter category could be funded through an expanded bus discretionary program and it can be made clear that the roadway improvements for both fixed guideway, as well as nonfixed guideway BRT projects are eligible under the National Highway System (when on or parallel to a NHS designated route) and the Surface Transportation Program.

The certainty provided by full funding grant agreements is as important to nonfixed guideway projects as it is to a new start. Therefore, allowing projects that exceed a certain cost threshold to obtain a Full Funding Grant Agreement (FFGA) represents an important tool in enabling these investments to advance. The current 20 percent of capital improvements funds set aside for the "bus discretionary" program (Title 49, Chapter 53, §5309(m)(1)(C) and §5309(m)(3)) could have the same eligibility for FFGA's, which enables multi-year commitments of Federal funds.

Because many of these projects will involve improvements to roadway open to other users, proposals that include funding from FHWA programs (such as the Surface Transportation Program and the National Highway System program) should be given priority over projects funded only through the bus discretionary program.

## TESTIMONY OF THE ROARING FORK TRANSPORTATION AUTHORITY

JUNE 24, 2003

The Roaring Fork Transportation Authority (RFTA) is Colorado's first rural transit authority, serving a 70-mile, three-county region (Garfield, Eagle, and Pitkin Counties) in Western Colorado. This project is increasingly being viewed as a model for future projects in other rural areas of the country confronted with rapid growth and increasing congestion.

In November 2000, this region created Colorado's first rural transportation authority through the simultaneous passage of formation and funding votes in seven different jurisdictions. This shows the enormous support the region has for transit, and has led to the project's success to date. The system is now the second largest transit system in Colorado, with ridership more than two times the per capita rate of Denver RTD.

This proposed Bus Rapid Transit system includes transit stations in each community, Intelligent Transportation System components, queue bypass lanes, an efficient alternative fuel vehicle fleet, Super Express service, an automated fare collection system, and a variety of other characteristics, making Bus Rapid Transit comparable to rail in terms of convenience, comfort, and travel-time savings at one-third the capital cost.

Moreover, this project has been rated as the top new project in the Colorado Department of Transportation's (CDOT) Intermountain Planning Region 2003 Strategic Investment Plan. In addition, the project is critical in meeting the transportation infrastructure needs of the region and extending the life of the existing CDOT and Federal investment in the region's highway system.

This project also shows how transit can provide enhanced access to the country's national forests and public lands. The project corridor includes Federal land managed by the U.S. Forest Service and the Bureau of Land Management and provides access to significant Federal and State holdings, including the White River National Forest, the Maroon Bells/Snowmass, Hunter/Frying Pan, and Holy Cross Wilderness areas, numerous Bureau of Land Management parcels, three Colorado Wildlife Management Units, and the Roaring Fork and Frying Pan Rivers, which are both Colorado Gold Medal fisheries.

The total cost of the project is $128 million. The project is currently authorized as part of TEA–21 and we are seeking authorization of the project in the TEA–21 reauthorization bill. We plan to request a total of $64 million in Federal funds to complete this project, which represents a 50 percent Federal match. Federal funds are being requested for the 40-mile stretch of Colorado State Highway 82, from West Glenwood Springs to Aspen. Federal funding is not being sought for improvements to the entrance to Aspen. The balance of funding would be covered by the State and localities, leveraging a variety of private and public funding sources.

The RFTA BRT project faces several unique challenges. First, it is one of the only New Starts projects in the Nation being pursued in a rural area. While the region is rural in population, due to linear growth and development the region experiences urban congestion. In addition, because we do not have a Metropolitan Planning Organization (MPO), it has become more difficult to fully meet the New Starts criteria and proceed through the FTA's New Starts process, which is designed for large urban areas with significantly sized and professionally staffed MPO's. Moreover, the current regulatory definition of Bus Rapid Transit confines projects to an urban area. Second, this project is located in a uniquely pristine geographic area in a narrow canyon, bordered by mountains, a river, and significant amounts of Federal land. Third, it is located in an area with a region-wide lack of affordable housing, causing many who work and live in this area to commute as much as 70 miles to their place of employment. Fourth, while most New Starts projects are in urban corridors not exceeding 20 miles, our project extends along a 70-mile corridor. We often say that we are "a rural area with urban problems." Because of these unique characteristics, we need the FTA's New Starts criteria and process to be flexible enough to accommodate this worthy project with significant local, State, and Congressional support.

The RFTA welcomes SAFETEA's creation of a "Small Starts" program to fund New Starts projects under $75 milllion. We welcome a streamlined process and application of reduced project justification criteria when appropriate and necessary for smaller projects such as ours which are not seeking large amounts of Federal funding. However, SAFETEA does not delineate how the criteria would be applied. We would welcome Congressional direction on the application of this program so that properties can have planning clarity and successfully navigate the New Starts proc-

ess. We also welcome SAFETEA's inclusion of nonfixed guideway improvements in corridors to encourage consideration of BRT options. A portion, but not all, of the RFTA BRT project is planned for HOV lanes, but the majority of the project will occur in mixed traffic with queue bypass lanes, priority traffic signalization, and other BRT features reflecting a substantial investment in the corridor. We urge the Committee to specifically consider enacting unique criteria applicable to New Starts projects in rural areas to help resolve current inconsistencies in the program.

Thank you for the opportunity to testify before the Committee. We look forward to working with you as you craft the reauthorization of TEA–21 to ensure that projects like ours are afforded a real opportunity to achieve Federal support and successfully navigate the New Starts process.