

# TRANSPORT INNOVATOR

VOLUME 3, No. 2

March/April 2007

Welcome to *Transport Innovator*, a free newsletter dedicated to sharing information about innovative, cost-effective transportation solutions. We welcome comments and ideas for future stories. Please feel free to contact us – we look forward to hearing from you. Free subscriptions are available at [www.gobrt.org](http://www.gobrt.org)

## Table of Contents

<i>Editorial</i> .....	2
<b>Time for Reflection on BRT</b> .....	2
<i>Guest Column</i> .....	3
<b>BRT Planning and Implementation Experience in 11 Cities</b> .....	3
<i>Guest Column</i> .....	4
<b>Bus Rapid Transit Systems: The Challenge of Worldwide Expansion</b> .....	4
<i>BRT and Innovative Bus</i> .....	7
<b>Connecticut: State funds Hartford-New Britain Busway</b> .....	7
<b>Santiago, Chile: Transantiago performance falls short</b> .....	8
<b>Jakarta, Indonesia: New buses held pending payment of import taxes</b> ....	8
<b>Mexico City, Mexico: New BRT corridor to be added by end of 2007</b> .....	9
<b>Los Angeles, California: Orange Line extension plans started</b> .....	9
<b>Los Angeles, California: Silver Streak rapid bus service debuts</b> .....	9
<b>Brisbane, Australia: Inner-Northern Busway ahead of schedule</b> .....	10
<b>Johannesburg, South Africa: Plans for Rea Vaya BRT under way</b> .....	10
<i>Transportation Policy</i> .....	11
<b>World Bank's Urban Bus Reform Toolkit Available</b> .....	11
<b>California: CalTrans Pledges to Support BRT</b> .....	11
<b>Toronto, Canada: Federal government invests in BRT</b> .....	11
<b>Connecticut: Report recommends increased bus funding</b> .....	11
<b>Polk County, Florida: Seeking county-wide bus system</b> .....	12
<b>Houston, Texas: Considering "public-private partnership" for BRT</b> .....	12
<i>Alternative Fuels</i> .....	12
<b>Arizona and Delaware: Fuel cell buses serve as educational tools</b> .....	12
<b>Connecticut: Hartford begins running fuel cell bus</b> .....	13
<b>More cites test hybrid buses</b> .....	13
<b>California: Evaluation of fuel cell bus demonstrations published</b> .....	13
<b>Amsterdam, Hamburg: Fuel cell bus trials extended to 2008</b> .....	14
<b>China: Supersize Me!</b> .....	14
<i>Technology</i> .....	15
<b>Manchester, United Kingdom: Bus shelters fitted with solar power</b> .....	15
<i>Odd But True</i> .....	15
<b>But did they pay the fare?</b> .....	15

## Editorial

### **Time for Reflection on BRT**

Bus rapid transit (BRT) is a proven sustainable transport strategy, but recent implementation glitches in Asia and Latin America threaten future success. Understanding why these glitches happened, and preventing future problems, is critically important.

Perhaps the most extreme problems have occurred in Santiago, Chile. Through Transantiago, the city is integrating all transit services in the metropolitan area. This is a monumental task, involving expanding the city's Metro, consolidating private bus operators into a BRT system with 14 concession contracts, developing integrated information and financial systems, and purchasing thousands of new buses.

Unfortunately, Transantiago has been plagued by poor service, sparking daily protests, particularly against the bus component. Transantiago is widely viewed as one of the biggest crises to strike Chile since democracy returned in 1990. In March, President Bachelet apologized and announced major improvements, and at least four senior government officials have been dismissed, including the transportation minister.

Fortunately, Transantiago is an extreme case. In most cities, implementation problems were solved within a few weeks. Nevertheless, these serial glitches can have a chilling effect and tend to overshadow the tremendous benefits offered by BRT.

In this edition of *Transport Innovator*, a guest column describes an upcoming study that analyzes recent BRT systems and makes recommendations for improved implementation. This study is very timely and, based upon the draft we have seen, should be carefully reviewed and considered.

In general, the study finds that BRT technology is not the problem, but rather inadequate planning and implementation. This is good news, because it suggests that future problems can be prevented through training, institutional capacity building, and other efforts designed to ensure high quality BRT programs.

It also suggests a need for international standards for BRT, similar to ISO standards used by businesses to improve quality and safety, and to reduce costs. Such standards would offer guidance on best practices, help safeguard against repeating mistakes, and provide quality assurance. Indeed, the US transit industry has such a standards effort underway, and we are co-chairing the standards committee.

Of course, any standard should be flexible enough to account for individual circumstances, and no standard will prevent all future debacles. Nevertheless, standards could provide a benchmark against which to assess the quality of potential BRT investments. The World Bank's research is an excellent first step and we need to build upon this work. Perhaps developing standards is the way to go.

---

## Guest Column

### **BRT Planning and Implementation Experience in 11 Cities**

*Dario Hidalgo, Ph. D., Transport Consultant and Pierre Graftieaux, Senior Transportation Specialist, The World Bank*

The success of bus rapid transit (BRT) is well known, but little is known about potential problems that may occur. To fill this gap, TRISP, a partnership between the UK Department for International Development and the World Bank, funded a study of 11 developing world BRT systems: 9 in Latin America and 2 in Asia. The study<sup>1</sup> will be published by the World Bank in the near future.

Although the cities differ greatly in size and socio-economic characteristics, they all make substantial use of buses and, before project implementation, transport conditions were considered appalling. The projects studied were designed to improve existing BRT public transport services by showcasing an alternative, either via pilot corridors or via large scale, city-wide reorganizations. All systems use some BRT elements to varying degrees.

The study includes general descriptions and comparative indicators, including total demand, peak loads, commercial speeds, productivity indicators, capital costs, and fares. Some systems show passenger loads usually reported by heavy rail systems (e.g. TransMilenio in Bogotá, reports 45,000 passengers per hour per direction), and very high productivities (10 boardings per bus-kilometer, or more than 3,000 passengers per bus per day, in the cases of México Metrobús and Quito Trolebús). The systems also show relatively low capital costs (USD 1.3 – 8.2 million per kilometer for the infrastructure).

It is widely acknowledged that most systems in the study have greatly improved the quality and performance of public transport. The main achievement has been travel time savings as well as enhanced reliability. As efficiency improved, energy consumption and emissions have been reduced. Urban enhancements also are evident in Curitiba, Sao Paulo, Bogotá, Quito, Pereira and Guayaquil.

There is compelling evidence that BRT is probably the best option for many developing world cities. It is therefore critical to understand the issues faced by existing systems so that they can be avoided in future projects. Thus, the study focused upon problems encountered by BRT projects, trying to identify their sources and to understand how they have been, or should be, solved.

The study found that some repetitive problems could have been avoided. In general, planning was under-funded, implementation was rushed, financial and institutional sustainability was not ensured, and integration with the rest of the transport system was incomplete.

---

<sup>1</sup> Prepared by Dario Hidalgo, Paulo Custodio and Pierre Graftieaux

In terms of infrastructure, pavement maintenance has been an issue, either due to inadequate design or to faulty construction. Some segregation devices suffered early deterioration and required replacement. Advanced fare collection systems have been difficult to implement, in part because insufficient time was devoted to adapting software to local conditions. With a few exceptions, fare collection systems also have not been integrated with other components of public transport or, in some cases, between corridors.

Most implementation problems have been gradually solved, and no system requires a complete overhaul. The most critical challenge is to maintain quality at an affordable fare and, in several systems, to ensure financial sustainability. In some cities, fares are set by a political process, not a technical process, and operational and capital subsidies are required. Renegotiation of contracts between authorities and private operators also creates sustainability challenges.

Another challenge is that funding for expansions and maintenance is very limited. Systems compete against funding for roads and confront risks of not receiving timely attention. Expansion is also limited by the resistance to change from existing bus operators.

The study describes the unique needs of each system and offers recommendations designed to help in the planning, implementation and operations of BRT systems, especially in the developing world. The study found that most problems are not intrinsic to BRT, but rather are the result of planning and implementation practices and of local institutional and economical conditions. To be solved, most problems require a political decision and some type of funding.

The complete study and accompanying materials will be posted in May on the World Bank's web site.

---

## Guest Column

### **Bus Rapid Transit Systems: The Challenge of Worldwide Expansion**

*Alain Wartel*  
*BRT Project Manager, Veolia Transport*

For decades, the bus has been the basic mode of public transportation in urban areas, undergoing no major changes either technically or in its appearance. By contrast, significant changes have been made to the image of other transportation modes, such as light rail (LRT) and private automobiles. As a result, the bus's image has suffered, becoming an antiquated although still essential form of urban transportation.

Municipalities have turned toward LRT, believing that only LRT can increase transit ridership and contribute to significant urban change. Although there have been successes, questions are emerging. For example, funding shortages and cost increases limit the ability to invest in LRT systems. At the same time, thanks to numerous experiments conducted worldwide (in North and South America, in particular), cities are taking a new look at buses.

Opinions now appear to have changed quite radically, with bus rapid transit (BRT) emerging as a preferred solution for strengthening public transportation and winning market share. Many cities have sought to create their own versions of BRT, with names such as Busway, Transitway, and BHNS (“Bus à Haut Niveau de Service”). These systems share basic features, such as dedicated infrastructure, priority at intersection traffic signals, high frequency, and strong visual identity to enable high speed, high capacity, reliable service. This attracts passengers and strengthens public transportation’s market share at a significantly lower cost than light rail and metros.

In North America, the overwhelming presence of personal automobiles, the level of public transportation investment, and the layout of American cities explain in large part the emphasis given to BRT. In developing countries, the main reason is budgetary. For example, Bogotá selected BRT (the “TransMilenio”) in part because it was much more cost-effective than a metro. The system is extremely efficient and carried about 1.3 million passengers per day in 2006. The Chinese government has restricted development of heavy rail systems to very large cities (those with over 3 million residents) and is encouraging the development of BRT in all other towns and cities.

As shown in the following chart, Veolia Transport has been involved in implementing BRT for many years and in very different contexts:

	<b>Las Vegas Max</b>	<b>Bogotá TransMilenio</b>	<b>Rouen TEOR (France)</b>	<b>Toronto-York VIVA</b>
Brought into service	2004	2001	2001	2005
Length (km)	12.6	84 (plus 477 km of feeders)	26 (38 km in 2007)	144 (planned)
Number of stops	23	114	41 (56 stations in 2007)	107
Distance between stops (meters)	546	737	624	745
Headway (mins. during peak traffic)	12	Less than 1	5-8	5
Number of vehicles	10 (Civis)	857 articulated	38	85
Capacity	120	170	100-150	100-150
Commercial speed (kph)	25-30	29	17.5	23-31
Ridership (passengers/day)	7,500	1.3 million	32,000	17,000



In Bogotá, Veolia Transport has a stake in two companies that operate a total of 250 articulated vehicles on TransMilenio's trunk corridors. TransMilenio has become one of the world's most complete and efficient BRT systems, with 84 km of exclusive running ways, an average commercial speed of 29 kph, and average daily ridership that rivals most rail systems. TransMilenio is truly the backbone of Bogotá's public transportation system and has all the characteristics of a "surface metro".

In Rouen (France), the presence of both a BRT and light rail system makes the city an interesting laboratory for assessing the relative performances of both systems and, above all, the customers' perception of their image and level of acceptance. The installation of an optical guidance system for automatic docking at stations is a first worldwide.



In Las Vegas, our US subsidiary is operating the MAX system, which is achieving encouraging results in a context where public transportation and leisure activities are strongly interlinked. It is quite remarkable that the city, which could easily have afforded a conventional rail system, preferred an innovative bus system.



In the Toronto suburbs, Veolia Transport operates the Viva BRT system. The current plan is that, by 2013, Viva may be converted into rail service. That's one of the advantages of BRT: it can be implemented in phases and offers much greater flexibility for change than do rail systems.

Based upon on our BRT experience, we believe that there are a number of issues that merit further exploration. First, the unique nature of European cities requires a new model for BRT in Europe. Although we have made a start on this in Rouen, the theory must be validated. The current development phase of TEOR — addition of a guidance system and move into the city center — will give a more comprehensive picture and enable us to verify its suitability.

Second, we are exploring how BRT might play a role equivalent to LRT in European cities. LRT has played a driving role during the past 20 years and has been a significant factor in a number of urban renewal programs. At the same time, however, it appears that buses have not benefited from the same resources, nor have they been given the same opportunities in terms of priorities, continuity in development, urban development, and urban integration. Thus, the issue is to determine what the bus could contribute to public transportation if it were given these same opportunities as LRT.

Finally, more work needs to be done on the capacity and economics of BRT. For example, it appears that BRT can offer the same level of capacity as light rail or

underground systems, provided they are given the same resources. However, comparative cost-effectiveness studies on BRT and LRT have yet to be conducted over a long enough period (30 years, for example, which is the expected life of a rapid transit system in a dedicated lane).

Although BRT may be a new field in developed countries, and bus transportation has not received support similar to that given to LRT, we believe that the bus will benefit from a revival in coming years. We look forward to helping cities realize the potential of BRT.

---

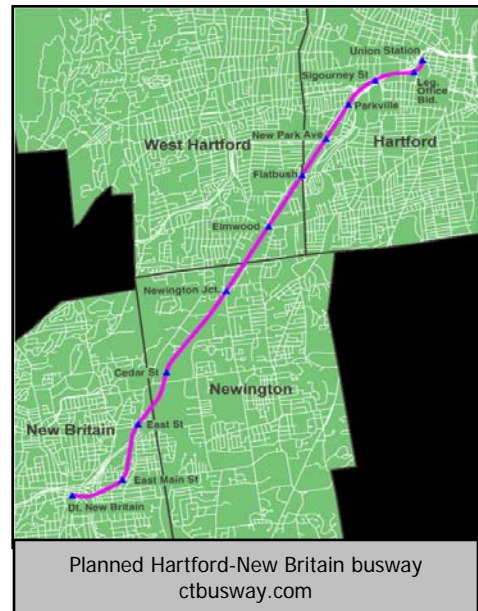
*Transport Innovator* welcomes guest columns on any topic related to sustainable transportation. Submissions should be no more than 1-2 pages in length and may include graphic materials. Although we may edit for length and style, we will obtain the author's permission to publish edited columns. Please send all guest columns to [info@gobrt.org](mailto:info@gobrt.org).

---

## *BRT and Innovative Bus*

### **Connecticut: State funds Hartford-New Britain Busway**

Connecticut's State Bond Commission will provide \$15 million to fund final design and property acquisition for the proposed \$485 million Hartford-New Britain busway. The 9.4-mile busway will run parallel to Interstate 84, the region's most congested highway, and is expected to serve 15,000 daily commuters. Busway vehicles, including a fleet of 60-ft hybrids, will serve 11 stations and run 18 hours a day. Governor Jody Rell said that the busway will help her achieve one of her main goals of "getting people out of their cars..." and would "be an important part of fostering redevelopment of areas around the bus stations." The State hopes to begin construction in 2009.



[http://www.nhregister.com/site/news.cfm?newsid=18152783&BRD=1281&PAG=461&dept\\_id=31007&rfl=6](http://www.nhregister.com/site/news.cfm?newsid=18152783&BRD=1281&PAG=461&dept_id=31007&rfl=6)  
[http://clubs.ccsu.edu/recorder/news/news\\_item.asp?NewsID=222](http://clubs.ccsu.edu/recorder/news/news_item.asp?NewsID=222)

## Santiago, Chile: Transantiago performance falls short



Transantiago protests

Photo:

[http://www.cerronavia.com/diariodetalle.php?id\\_diario=54](http://www.cerronavia.com/diariodetalle.php?id_diario=54)

Transantiago's bus lane system was inaugurated in February 2007 and has suffered significant problems. Among other things, the system suffered from infrequent and sometimes absent buses, insufficient quantity of bus lanes and failure of the GPS satellite-navigation system to control bus schedules. Santiago residents expressed extreme frustration and anger, with more than 120 protests, riots and clashes with police. Chile's Transport Minister responded by extending 73 bus routes and adding 300 additional buses. President Bachelet announced 23 measures to improve Santiago's transport services, including new bus services to ease crowding on the Metro, new express bus services on urban highways, more night

buses and bus lanes, and new Metro trains with extended service hours. The cost of these measures is \$27.8 million, to be taken from 2008 infrastructure funds.

[http://www.tcnews.com/santiagotimes/index.php?nav=story&story\\_id=13188&topic\\_id=15](http://www.tcnews.com/santiagotimes/index.php?nav=story&story_id=13188&topic_id=15)

[http://www.tcnews.com/santiagotimes/index.php?nav=story&story\\_id=13208&topic\\_id=15](http://www.tcnews.com/santiagotimes/index.php?nav=story&story_id=13208&topic_id=15)

[http://www.tcnews.com/santiagotimes/index.php?nav=story&story\\_id=13262&topic\\_id=15](http://www.tcnews.com/santiagotimes/index.php?nav=story&story_id=13262&topic_id=15)

[http://www.economist.com/world/la/displaystory.cfm?story\\_id=8829335](http://www.economist.com/world/la/displaystory.cfm?story_id=8829335)

[http://www.bnamericas.com/content\\_print.jsp?id=385351&idioma=1&sector=&type=NEWS](http://www.bnamericas.com/content_print.jsp?id=385351&idioma=1&sector=&type=NEWS)

## Jakarta, Indonesia: New buses held pending payment of import taxes

One hundred-thirteen imported buses destined for Jakarta's busways cannot be placed into service because of a dispute over import duties. According to Indonesian customs officials, the buses are "luxury items" subject to tax. Although the buses have already been assembled by TransJakarta, the unsettled tax payment is holding up deployment on the busways. Jakarta is appealing to the Indonesian Directorate General of Customs and Excise to reduce the taxes.

The undersupply of buses is having a significant impact on operations. The Jakarta Post reports that only 96 of the planned 125 buses are serving the first busway corridor, 94 of 126 buses are deployed in the second and third corridors, and only 32 of 113 planned buses operate on the four newest busway corridors. As a result, TransJakarta buses are significantly overcrowded, and passengers are experiencing long waits at stations.



TransJakarta bus

Photo: <http://www.iakarta.go.id>

<http://www.thejakartapost.com> (March 8, 2007 and April 10, 2007)

## Mexico City, Mexico: New BRT corridor to be added by end of 2007

The Mexico City transport and roads ministry has announced that a new Metrobús BRT corridor will be introduced by the end of 2007. The 17.8-kilometer (11.1-mile) east-west Eje 4 Sur busway will be located between Zaragosa and Tacubaya and will feature 35 new stations and 64 low-emission, 160-passenger capacity buses. These will replace 550 buses currently operating in the corridor.



Metrobús  
Photo: Breakthrough Technologies

An 8-kilometer (5-mile) extension of the Avenida Insurgentes busway will also be added by the end of the year. Insurgentes opened in mid-2005 and carries about 263,000 passengers per day. It is credited with a significant reduction in traffic congestion and air pollution.

The Mexico Federal District has approved \$32.1 million in funding for the two projects (75% of the total costs), which includes a loan from the World Bank. The Ministry intends to add two new busway corridors each year for the next six

years, for a total of 12 busway corridors.

<http://www.bnamericas.com/story.jsp?idioma=1&sector=5&noticia=383129>

[http://www.bnamericas.com/content\\_print.jsp?id=82294&idioma=1&sector=5&type=OA](http://www.bnamericas.com/content_print.jsp?id=82294&idioma=1&sector=5&type=OA)

## Los Angeles, California: Orange Line extension plans started

Los Angeles County Metropolitan Transportation Authority (Metro) has awarded a contract to Iteris, Inc. for preliminary planning and engineering for a proposed six-mile Orange Line busway extension. The Orange Line opened in October 2005 and operates on a 14-mile dedicated right-of-way between the Warner Center and the North Hollywood Metro Red Line Station. It has significantly exceeded ridership expectations and carried 23,000 average daily riders in March, more than what was projected for the year 2020. The proposed extension would continue the Orange Line north to the Chatsworth Metrolink station, and possibly on to the 118 Freeway.

[http://www.sfvbj.com/industry\\_article.asp?aID=37294888.1738192.1456923.8341752.05657702.196&aID2=112062](http://www.sfvbj.com/industry_article.asp?aID=37294888.1738192.1456923.8341752.05657702.196&aID2=112062)

## Los Angeles, California: Silver Streak rapid bus service debuts

Foothill Transit's Silver Streak rapid bus service rolled out in March 2007, traveling a 40-mile route along the San Bernardino Freeway from the San Gabriel Valley to Los Angeles. The new service mimics Foothill Transit's current Route 480 line, but the transit agency has successfully reduced the two-hour journey time to 90 minutes by using HOV and busway lanes, making fewer stops, and allowing three-door boarding. Silver Streak buses also offer passengers free wireless service.

<http://www.latimes.com/news/printedition/california/la-me-streak19mar19,1,7050656.story?coll=la-headlines-pe-california>

## Brisbane, Australia: Inner-Northern Busway ahead of schedule

The Queensland Transport Minister has announced that construction on Brisbane's \$333 million AUD (\$275 million USD) Inner-Northern Busway (INB) extension is six months ahead of schedule and will be finished before mid-2008. The first portion of the INB, which opened in 2004, features 1.7 miles of two-lane dedicated busway that will reach 2.5 miles when the addition is complete. The Inner-Northern Busway is expected to serve 2,000 buses daily and reduce bus times by 20 minutes during peak periods.

Brisbane's first busway opened in 2000, increasing corridor ridership by 88% more than pre-busway levels. It has been reported that properties located near the busway appreciated faster than properties farther away. The Queensland government is developing three additional corridors - the Northern, Eastern and Boggo Road busways - which will form a network that will connect Brisbane's dispersed development and provide a one-seat ride from one side of the city to the other. For additional information on Brisbane's busways, visit [http://www.translink.com.au/qt/translin.nsf/index/busway\\_main](http://www.translink.com.au/qt/translin.nsf/index/busway_main).



<http://www.abc.net.au/news/newsitems/200703/s1872038.htm>

## Johannesburg, South Africa: Plans for Rea Vaya BRT under way

Johannesburg officials have begun planning the city's new Rea Vaya BRT, a high speed, high frequency bus service that will debut in April 2009. The first phase will feature six routes spanning 96 kilometers (60 miles) that will operate in dedicated lanes in the center of existing roads. When completed, the system will span 325 kilometers (about 200 miles). Rea Vaya will use the same business model as Bogota, Colombia's TransMilenio BRT, incorporating the city's existing taxi and bus operators into the new BRT service. More information on Rea Vaya is available at [http://www.joburg.org.za/2005/dec/dec19\\_vaya.stm](http://www.joburg.org.za/2005/dec/dec19_vaya.stm).

[http://www.mg.co.za/articlePage.aspx?articleid=303979&area=/insight/insight\\_economy\\_business](http://www.mg.co.za/articlePage.aspx?articleid=303979&area=/insight/insight_economy_business)

## Transportation Policy

### **World Bank's Urban Bus Reform Toolkit available**

The Transport Group of the World Bank, with the support of the Public-Private Infrastructure Advisory Facility (PPIAF), has just web-published the Urban Bus Reform Toolkit (first profiled here in our May 2006 issue). The website contains tools and information designed to introduce Private Sector Participation (PSP) to urban bus services. The Toolkit provides developing country transportation authorities with the ability to evaluate their transit systems, restructure their organizations in both function and governance, and critically evaluate reform options. The Toolkit was developed by CPCS Transcom and is available for free at [www.ppiaf.org/UrbanBusToolkit](http://www.ppiaf.org/UrbanBusToolkit). A CD-ROM version may be ordered by sending an email to [transport@worldbank.org](mailto:transport@worldbank.org).

### **California: CalTrans pledges to support BRT**

The California Department of Transportation (CalTrans) recently published a policy statement supporting implementation of bus rapid transit in California. The policy states that CalTrans supports BRT "as a potentially cost-effective strategy to maximize people throughput, reduce traveler delay, increase capacity, and foster energy savings on the California State Highway System as well as on conventional streets and highways." The policy directs CalTrans staff to work with local agencies to "innovate, implement, and advocate BRT systems." The policy also includes information about BRT in California and is available at:

[http://www.dot.ca.gov/hq/MassTrans/DOCS\\_PDFS/BRT/BRT\\_Handbook\\_0307.pdf](http://www.dot.ca.gov/hq/MassTrans/DOCS_PDFS/BRT/BRT_Handbook_0307.pdf).

### **Toronto, Canada: Federal government invests in BRT**

The Canadian federal government is investing \$962 million CAD (\$845 million USD) for public transit in the Greater Toronto Area. Roughly \$700 million CAD will support a 8.6-kilometer (5.3-mile) subway extension and the remainder will fund four BRT projects: Brampton AcceleRide; Mississauga BRT; Phase 2 of the York Region Viva BRT system; and the Durham Region Rapid Transit Project. Other Canadian cities with successful BRT programs include Ottawa, Vancouver and Calgary.

[www.pm.gc.ca/eng/media.asp?category=1&id=1557](http://www.pm.gc.ca/eng/media.asp?category=1&id=1557)

Mississauga press release (March 8, 2007): <http://www.mississauga.ca/portal/cityhall/pressreleases>

[http://www.york.ca/Public+Notices/Public+Notices\\_Transit.htm](http://www.york.ca/Public+Notices/Public+Notices_Transit.htm)

<http://www.kingsentinel.com/news/2007/0404/news/041.html>

### **Connecticut: Report recommends increased bus funding**

In March, a new study by The Transit Coalition, a coalition of Connecticut bus operators, business leaders and environmental groups, recommended a five-year \$79.5 million investment plan for existing bus systems, and a long term investment of \$215 million that would fund BRT. This investment could increase bus ridership in Connecticut by

80%, according to the study. State Senator Bob Duff agreed, noting that, “bus service has always been the ignored stepchild, but investing in it would get results.” In a news report on the study’s findings, Connecticut Department of Transportation’s transit administrator Michael Sanders was quoted as saying that the technology for the 21<sup>st</sup> century is going to be “mass transit on rubber wheels.”

<http://www.stamfordadvocate.com> (Feb. 26, 2007)

<http://www.connpost.com> (March 21, 2007)

### **Polk County, Florida: Seeking county-wide bus system**

A bill before the Florida legislature would create a Polk County Transit Authority designed to build and operate a county-wide bus system. Currently, much of the county has minimal transit service and the population is growing. It is hoped that a new transit authority will enable the county to request an increase in property or sales taxes to pay for the new bus services. Among other things, the new services would include an express bus or BRT service operating in the I-4 corridor.

<http://www.theledger.com/apps/pbcs.dll/article?AID=/20070326/NEWS/703260372&SearchID=73277939301833>

### **Houston, Texas: Considering “public-private partnership” for BRT**

Houston’s Metropolitan Transit Authority (Metro) is negotiating a long-term contract with a private team to design, build, operate and maintain the city’s four planned BRT lines. Once operational, the BRT will be owned by Metro, which will retain income and set fares and schedules. The private team will be paid for building and managing the BRT for a period of more than a decade. According to Metro consultant Frank Russo, the arrangement divides risk so that the public sector assumes the risk of lower fare revenue and the private sector assumes some risk in the event of cost overruns.

<http://www.chron.com> (March 26, 2007)

## Alternative Fuels

### **Arizona and Delaware: Fuel cell buses serve as educational tools**

A hybrid fuel cell bus has begun touring Arizona to educate the public about hydrogen and fuel cell technology. The ECObus was developed by ECOTALITY, a renewable energy company, to serve as a traveling educational facility. Hydrogenics Corporation oversaw conversion of the bus, which uses three Hydrogenics fuel cell modules (180 kW total power) and a 720-volt bank of ultracapacitors. The bus will reach a top speed of 55 mph and have a range of 4 to 8 hours.

The University of Delaware began running a fuel cell shuttle bus built by the school’s engineering students. Students conducted laboratory research on how to make fuel

cells more efficient and less costly and will collect performance data during bus operations. After running campus shuttle service, the bus will perform demonstrations through the local transit agency.

<http://www.h2daily.com/news/hydrogen-fuel-cell-bus-begins-tour-of-arizona-20070317-91-50.html>

<http://www.udel.edu/PR/UDaily/2007/apr/bus040907.html>

## Connecticut: Hartford begins running fuel cell bus



Fuel cell bus in Hartford  
UTC Power

A hybrid fuel cell transit bus has begun a two-year service trial with Connecticut Transit in Hartford. The 40-ft Van Hool bus is powered with a hybrid drive using UTC Power's 120-kW fuel cell system. The bus will run on several routes to evaluate performance in a variety of transit service conditions. The bus is based on the design of four Van Hool fuel cell buses ordered by California's AC Transit in 2003.

<http://www.courant.com/news/opinion/editorials/hc-fuelcellbus.artapr11.0.5515858.story?coll=hc-headlines-editorials>

[http://www.prnewswire.com/cgi-bin/stories.pl?ACCT=ind\\_focus.story&STORY=/www/story/04-10-2007/0004562730&EDATE=TUE+Apr+10+2007,+12:30+PM](http://www.prnewswire.com/cgi-bin/stories.pl?ACCT=ind_focus.story&STORY=/www/story/04-10-2007/0004562730&EDATE=TUE+Apr+10+2007,+12:30+PM)

## More cites test hybrid buses

An increasing number of cities in Europe, Australia and Canada are testing hybrid buses. In Europe, Stockholm will begin large-scale testing of hybrid electric buses using an ethanol fuelled engine and supercapacitors. In the UK, Transport for London will test Volvo hybrid double-deck buses in 2008; London is already testing hybrid double-deckers made by Wrightbus. In Australia, Melbourne will test 24 diesel-electric hybrids as part of a plan to replace the state of Victoria's 880-bus fleet. In Canada, several cities are joining Toronto and Vancouver in placing hybrids into their fleets, including Hamilton, Ontario, Gatineau, Quebec, and Banff, Alberta.

<http://www.theautochannel.com/news/2007/02/21/037820.html>

[www.tnn.co.uk/Manufacturers/plonearticle.2007-03-22.8096115658](http://www.tnn.co.uk/Manufacturers/plonearticle.2007-03-22.8096115658)

<http://www.theage.com.au/news/national/melbourne-set-to-catch-hybrid-bus/2007/03/12/1173548107191.html>

<http://www.cbc.ca/canada/ottawa/story/2007/02/16/bus.html>

<http://www.myhamilton.ca/myhamilton/CityandGovernment/NewsandPublications/NewsReleases/2007News/April/07-04-03ph.htm>

<http://www.rockymountainoutlook.ca/portals-code/list.cgi?paper=128&cat=23&id=961687&more=>

## California: Evaluation of fuel cell bus demonstrations published

The US Department of Energy's National Renewable Energy Laboratory (NREL) published the preliminary results from its evaluation of two hydrogen bus demonstrations in California.

- In Oakland, AC Transit has been operating three prototype hybrid fuel cell buses since March 2006. The buses equip a Van Hool chassis with a hybrid powertrain using UTC Power's 120 kW fuel cell system and Zebra nickel sodium chloride batteries. NREL found that the fuel cell buses' average fuel economy is 56% higher than the diesel fleet.
- In Palm Springs, SunLine Transit is operating one of the Van Hool fuel cell buses as well as a prototype hybrid hydrogen internal combustion engine (HHICE) bus. NREL found that the fuel cell buses' fuel economy was 149% higher than SunLine's CNG buses, while the HHICE bus was 46% higher. The fuel economy of the fuel cell bus was 71% higher than the HHICE bus.

The full reports can be found at the DOE Technology Validation site:  
[http://www1.eere.energy.gov/hydrogenandfuelcells/tech\\_validation/ca\\_transit\\_agencies.html](http://www1.eere.energy.gov/hydrogenandfuelcells/tech_validation/ca_transit_agencies.html)

### **Amsterdam, Hamburg: Fuel cell bus trials extended to 2008**

Amsterdam and Hamburg are extending their fuel cell bus demonstrations into 2008. This is the second extension for these two cities. Hamburg is currently operating nine buses and Amsterdam is operating three. Ballard Power Systems, which supplied the fuel cell stacks and is responsible for field service for the buses, reports that the Amsterdam and Hamburg fuel cell drive systems averaged 98% availability in 2006. Amsterdam also expects to begin testing a hydrogen fueled boat later this year. A consortium of Dutch companies is designing and building the boat, which will operate in the city's canals.

[http://www.greencarcongress.com/2007/04/ballard\\_picks\\_u.html](http://www.greencarcongress.com/2007/04/ballard_picks_u.html)  
<http://www.global-hydrogen-bus-platform.com/News/LatestNews>

### **China: Supersize me!**



China has unveiled a new 40-seat, 25-meter (80 foot) SuperLiner bus that can accommodate 300 passengers and can attain an estimated top speed of 80 kilometers (50 miles) per hour. The vehicle will be put into BRT service in Beijing and Hangzhou City. Initial news reports claimed it as the world's longest bus, but Volvo already makes 25-meter buses used in Curitiba's BRT.

[http://www.shanghaidaily.com/sp/article/2007/200703/20070314/article\\_309016.htm](http://www.shanghaidaily.com/sp/article/2007/200703/20070314/article_309016.htm)

## Technology

### **Manchester, United Kingdom: Bus shelters fitted with solar power**

Twenty-nine Manchester region bus shelters will be fitted with roof-mounted solar panels that will generate power for night-time lighting. The system will be motion-activated, turning lights on only when passengers are at the shelter. The lighting is being added to increase passenger safety and has already been tested at two of the city's bus shelters. The installation will be completed in 2007 at a cost of £100,000 (about \$198,000 USD). Expected benefits include a reduction of more than 14.3 tons of carbon dioxide greenhouse gas emissions.

<http://www.newbuilder.co.uk/news/NewsFullStory.asp?ID=1925>

## Odd But True

### **But did they pay the fare?**



Kinkajou  
Drawing:  
[http://www.guyana.org/Guyana\\_Photo\\_Gallery/animals/animals.html](http://www.guyana.org/Guyana_Photo_Gallery/animals/animals.html)

Since January, an adventurous cat has hitched rides on a bus traveling between Walsall and Wolverhampton in the United Kingdom, boarding and exiting at the same stops. Riders have seen the cat sitting at the front of the bus two to three times a week and speculate that the feline may be headed to a local fish and chip shop.

In related news, a kinkajou – a nocturnal arboreal rainforest mammal related to the raccoon - escaped from the Mexico City zoo and climbed aboard a night bus. The animal sat next to the driver for almost an hour before it was removed from the vehicle.

<http://www.zeenews.com/articles.asp?aid=365243&sid=LIF&ssid=204>  
[http://www.belleville.com/mld/belleville/news/breaking\\_news/17022268.htm](http://www.belleville.com/mld/belleville/news/breaking_news/17022268.htm)