



**\*\*\*Reports from the 2003 TRB Annual Meeting, January 2003\*\*\***

*(Report on TRB Conference Session # 230, Prepared by Session Moderator, John Dockendorf, PENN DOT)*

# Latest Developments in Bus Rapid Transit

For the fifth consecutive year, our Committee, and FTA, co-sponsored a Bus Rapid Transit (BRT) conference session. This year's program featured presentations by Bert Arrillaga, FTA, Joseph Calabrese, General Manager of GCRTA (Cleveland), Dennis Hinebaugh, CUTR/NBRTI and Sam Zimmerman, Daniel, Mann, Johnson & Mendenhall (DMJM). Mr. Arrillaga's presentation summarized both the past annual, and upcoming future, activities of FTA's National BRT Program and Consortium. Bert indicated that Las Vegas has been added to this group as a result of their innovative BRT proposal to link Downtown with the City of North Las Vegas. Their proposal plans to utilize a number of BRT features including the utilization of a special vehicle with optical guidance, off-vehicle fare collection and stations with boarding platforms. To help facilitate the timely procurement of special vehicles for Las Vegas, and selected other Consortium cities, FTA has proposed a waiver from Altoona Bus Testing requirements for the procurement of less than 10 BRT special vehicles. In addition, Mr. Arrillaga reported that FTA is considering hosting a national BRT conference in 2004.

Bert indicated FTA would be willing to partner on this meeting with other groups, such as our Committee, and is flexible regarding which group(s) takes the lead role on this venture. Finally, Mr. Arrillaga reported that FTA's BRT Consortium plans to have at least two workshops this year – one in Los Angeles from April 8–9 and the other in Minneapolis on May 9. FTA also plans to conduct initial evaluations of the BRT projects in Pittsburgh, Miami and Honolulu. An evaluation of Los Angeles' BRT project has already been done.

The next speaker, Mr. Joseph A. Calabrese, Chief Executive Officer/General Manager of the Greater Cleveland Regional Transit Authority (GCRTA), covered both APTA's "BRT Task Force" and the Authority's innovative BRT project. APTA established the "BRT Task Force" in August 2001 to help coordinate the various BRT activities being conducted by APTA, FTA, NTI, and TRB. The "Task Force" has periodically conducted joint meetings with these organizations to help keep everyone

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## Report from Committee AIE01 Chairman John Dockendorf

Thanks to the help of a number of our members, I am pleased to report that our Committee had a very active year. At January's Annual Meeting we once again sponsored two paper sessions, one BRT conference session and contributed two papers to the Section E poster session.

Also, we, along with the Committee on High Occupancy vehicles (A3A06), jointly sponsored a summer conference on Vehicle Priority activities in Seattle last summer. A summary of each of the paper and conference sessions and the joint summer session are provided in this newsletter.

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**Committee chairman report (continued)**

Also, this past year the Committee completed its required triennial membership rotation. I am pleased to welcome the following new members:

- Dan Boyle, Dan Boyle and Associates, Los Angeles, CA
- Joana Conklin, Multi-systems, Cambridge, MA
- David Dickey, URS Corporation, Atlanta, GA
- Peter Koonce, Kittelson & Associates, Portland, OR
- Edward Mark, New York State DOT, Albany, NY
- John McGee, Southeastern Pennsylvania Transportation Authority, Philadelphia, PA

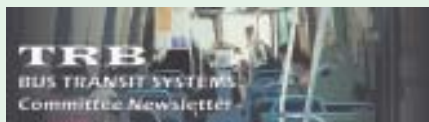
Finally, Committee member, Frank Spielberg, received TRB's prestigious "Emeritus Member" award. Congratulations Frank!

The Committee also agreed to establish a BRT Subcommittee to help us respond to the many on-going program activities. Committee member Dennis Hinebaugh was selected to Chair this group and fifteen other Committee members and four other non-committee members volunteered to serve on this subcommittee. This subcommittee will work on a number of BRT-related activities including organizing future summer meetings, planning annual conference sessions and conducting paper reviews. To improve communication, the Committee decided to establish its own website. Once again Dennis Hinebaugh and the University of South Florida's Center for Transportation Research (CUTR) volunteered to assist us with this initiative.

It is expected that our website will be "up and running" by the time you receive this newsletter. (<http://TRBbustransitSystems.NCTR.usf.edu>) Also the Committee agreed to partner with TRB's Committee on High Occupancy Vehicle Systems (A3A06) to plan for a sequel in the summer of 2004 to our successful national BRT conference in August, 2001. Our new BRT Subcommittee has already started preliminary work to help organize and promote this conference. It expects to work closely with FTA's BRT Consortium, The TCRP A-23A project panel, APTAs BRT Task Force and the joint CUTR/University of California, (Berkeley) National BRT Institute on this project. There will be more specific information regarding the time and location of this planned conference in our next scheduled newsletter this Fall as well as on our website.

In conclusion, it has been, and will continue to be, a very exciting time for our Committee. I greatly appreciate everyone's past work on these various projects, and look forward to your continued help in the future. ♦

Thanks again to our  
Bus Transit Com-  
mittee Members and  
Friends for another  
productive year!



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## Latest Developments in Bus Rapid Transit (continued)

aware of the many current activities and planned future BRT initiatives being considered. Also, the group has included BRT sessions at APTA's national meetings. The balance of Mr. Calabrese's time was devoted to providing an overview of GCRTA's unique "BRT Euclid Avenue Corridor Demonstration Project". This proposal includes most of the more sophisticated BRT elements, including the use of ex-



clusive lanes, traffic signal prioritization, special vehicles and innovative boarding and fare collection practices.

The Authority plans to use a special 60' low-floor, articulated diesel electric vehicle with doors on both sides to accommodate both "right side" and "left side" passenger boarding along different segments of the Euclid Avenue median. Overall, the Authority expects a 25% reduction in passenger travel time and estimates that the total cost will be just under \$250 million. This amount represents an estimated 66% cost savings when compared to the option of using rail vehicles instead of buses. The final design for this project is expected to be completed this July, and

actual construction is scheduled to begin next January.

Dennis Hinebaugh introduced their new National Bus Rapid Transit Institute (NBRTI) which is jointly managed by CUTR at the University of South Florida and the University of California, Berkeley's Institute of Transportation Studies. The NBRTI was established to facilitate the sharing of knowledge and innovation for increasing the speed, efficiency and reliability of high capacity bus service through BRT implementation. The Institute has already conducted an evaluation of the Miami-Dade County Busway and Orlando's LYNX "Lymmo" BRT projects. Both projects were found to be effective in attracting new transit users, and significantly reducing both passenger travel time and overall congestion. Other planned Institute activities include providing BRT "peer-to-peer" technical assistance, publishing quarterly newsletters, conducting periodic workshops, establishing a new website and providing a calendar of upcoming events. Their initial quarterly newsletter has already been published and distributed.

Finally, Mr. Sam Zimmerman and Mr. Herb Levinson, co-investigators for the TCRP A-23 Project, Bus Rapid Transit Implementation Guidelines provided an update on the activities and products of this special BRT initiative.

Sam reported that this study produced the following five BRT products:

(1) a Bibliography, (2) an On-Line Video Library, (3) a BRT brochure, (4) case studies for 26 international BRT projects including a synthesis and (5) a BRT planning and implementation guidelines manual. This latter product, which is based on the forenamed case studies, includes detailed guidance on BRT planning, vehicle selection, ITS Integration, service planning and implementation, traffic engineering integration, and station and terminal design. Finally, this manual addresses the basic BRT "what", "why", "when" and "how" questions. Also it documents the benefits of the current BRT projects in Boston, Los Angeles, Miami and Vancouver. It is expected that this helpful manual will become available this Summer. As a result of our Committee's recommendation, TCRP has agreed to initiate a follow-up study this year to build upon the success of this A-23 project. This new initiative, "Determining the Cost-Effectiveness of Selected Bus Rapid Transit Strategies in Increasing Transit Ridership", (A-23A), will commence in mid-February. The same oversight panel for the A-23 project will be used by TCRP for this new A-23A project. ♦

*(Report on TRB Conference Session # 301, Prepared by Session Moderator, George Pierlott, Mundle & Assoc., Inc.)*

## Current Bus Rapid Transit Activities and Models

The first presentation was given by Timothy Papandreou. Mr. Papandreou is a Transportation Planning Manager for the Los Angeles County Metropolitan Transportation Authority. His paper, "Wilshire Bus Rapid Transit – More than Just a Dedicated Bus Lane," describes the performance attributes of the Wilshire Bus Rapid Transit project currently being considered by the Los Angeles County Metropolitan Transportation Authority (MTA). This project will provide enhancements to the existing Metro Rapid Bus Line #720 from the current terminus of the Metro Red Line at Wilshire/Western in the City of Los Angeles to Ocean/Colorado in Downtown Santa Monica. The purpose of the enhancements will be to provide additional service to meet the latent travel demand in the area.

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## New Findings on Bus Operations

The session featured four papers each of which illustrated the application of analytic techniques to practical problems related to bus operations. The first paper by Chang and



Ziliaskopoulos, "Data Challenges in the Development of a Regional Assignment-Simulation Model to Evaluate Transit Signal Priority in Chicago" reported on the numerous issues that arose in an evaluation of Transit Signal Priority for buses in the Chicago region. The authors carried out this evaluation using regional travel simulation models. In the presentation Ms. Chang focused on the practical issues related to gathering the street network, bus route and traffic signal data necessary for the simulation model. The paper goes into greater depth on several aspects of the effort and provides the reader with a good overview on the implementation the Transit Signal Priority, of approaches to regional simulation of traffic now becoming available, and of the types of data that are needed for such methods to be applied.

The second paper by Mark Hickman, *Robust Passenger Itinerary Planning Using Transit AVL Data*, was accepted for presentation only and is not available on the pre-print CD nor will it be published by TRB.

Interested readers can find the paper in "Robust Passenger Itinerary Planning Using Transit AVL Data," *Proceedings of the IEEE 5th International Conference on Intelligent Transportation Systems, 3-6 September 2002, Singapore*, pp. 840-845. or by contacting Dr. Hickman at [mhickman@engr.arizona.edu](mailto:mhickman@engr.arizona.edu).

Dr. Hickman addressed the question of providing to transit riders information on alternative routes between selected points served by transit incorporating not only the times and connections *as scheduled* but also the probable times given day-to-day variation in bus travel times and arrival times captured by the transit agency's AVL system. A method of assessing the many possible alternatives in an efficient manner is described and applied to a trip over the transit system in Tucson AZ. The results illustrate that there can be significant variations from scheduled times such that riders would benefit from the added information.

The third paper, *Integrated Smart Feeder/Shuttle Bus Service*, by Ceder and Yim reported on the process of developing and evaluating routing and operational strategies for feeder service to the BART rail system in Castro Valley CA. The intent was to design a service that could provide something approaching door-to-door connections with smooth and synchronized transfers. The required characteristics for the service were defined to be: attractive, reliable, safe, rapid, smooth and synchronized. Ten routing strategies were developed and analyzed using a simulation model. The session was well attended with about 100 persons in the audience for at least part of the session and a peak audience of about 75. ♦



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### Current Activities and Models (continued)

By introducing a variety of BRT components such as higher capacity articulated vehicles, enhanced stations, fully compatible signal priority across the entire project route and peak period curbside dedicated transit lanes, the results of the research show that travel speeds will increase approximately 21 to 27 percent thereby reducing run times from 65 to 69 minutes down to 40 minutes. Dr. Tunde Balvanyos was the second presenter. Dr. Balvanyos is a visiting post-doctoral researcher at the University of California's Partners for Advanced Transit and Highways. Dr. Balvanyos' presented her paper "SmartBRT: A New Simulation Tool to Assess Bus Rapid Transit Systems," which reports on a two-year project to develop a computer simulation, evaluation and visualization tool that can be used to analyze BRT operation and infrastructure concepts. The software which was developed through this project is known as *SmartBRT*. As part of the project to develop *SmartBRT*, a case study analysis was performed to show the usefulness and capabilities of the tool. The case study consisted of an analysis of the Wilshire BRT project in Los Angeles that was described in Session 301's first presentation. Throughout the presentation, Dr. Balvanyos showed many of the features of *SmartBRT* and demonstrated their usefulness to transit operators and planners who are considering future BRT systems. *Smart BRT* provides the capability to conduct various types of analyses (e.g., what-if, trade-off, and cost-effectiveness) without assuming the risks of the investments normally required to conduct field operations testing.



The third presenter was Michael Baltes. Mr. Baltes is a senior research associate for the National Bus Rapid Transit Institute at the Center for Urban Transportation Research (CUTR) in Tampa, Florida. His paper, "Statistical Estimation of the Importance Customers Place on Specific Service Characteristics of Bus Rapid Transit," analyzes the significance that customers place on various BRT service characteristics. Mr. Baltes research analyzed data from two on-board customer surveys conducted in Miami and Orlando. The survey results were analyzed using statistical mean scores and STEPWISE regression to discern relative weight of different characteristics in determining customer satisfaction with BRT service. The results of the analysis show that the quality aspects that customers focus on include reliability, frequency, comfort, speed, and safety.

The final paper of the session was presented by Herb Levinson and Sam Zimmerman. Both gentlemen are co-principal investigators for TCRP Project A-23, "Planning and Implementation Guidelines for Bus Rapid Transit Systems." Mr. Levinson and Mr. Zimmerman presented a synthesis of case studies which described the nature of BRT and various key features of BRT operations. The presentation focused on those aspects of BRT that are the most important contributors to its success, namely running ways, station design, vehicle design and service patterns. Also addressed were ridership performance, service quality issues, and policy issues. As in the past, the BRT session was very well attended. More than 150 people were in the audience. Each presentation was followed by a question and answer period, which as usual, sparked a lively discussion of issues related to BRT. ◆



# TRB's 11th International HOV Conference

The TRB's 11<sup>th</sup> International HOV conference was held October 27- 30 in Seattle. The event was hosted by the Washington State Department of Transportation and Sound Transit. Over 240 transportation planning professionals from around the United States and several foreign countries attended the three-day event.

The conference theme was "HOV: Evolution or Revolution?" That theme was carried through presentations divided into three subject areas: HOV, Bus Rapid Transit, and Managed Lanes. BRT prominence is indicative of the evolution of HOV planning, where emphasis on transit use of HOV facilities is now often on the same level as more traditional HOV design issues. The large number of BRT sessions and strong attendance also reflects the increasing recognition of bus transit's role in HOV system planning.

The BRT sessions provided numerous examples of how BRT can be effectively integrated with HOV corridor plans and projects, whether for limited access facilities or local arterials. From the conference presentations it is apparent that BRT in its various forms is under active consideration in a growing number of metropolitan areas. Though BRT has established an impressive track record, the presentations also made it clear that careful planning is required to adapt BRT to fit the wide range of local conditions where it is has been implemented



The conference BRT sessions were:

## #2. Integrating BRT with Freeway HOV lanes

- Integrating Freeway and BRT operations, Lessons learned from Canada, New Zealand & Australia (Sean Rathwell)
- BRT Freeway Station Design, San Diego North I-15 Corridor Project (Dave Schumacher)
- Integrating HOV & BRT in Toronto (Stephen Schijns)
- HOV & Transit Priority Solutions on I-90 in Seattle (Don Samdahl/Andrea Tull)

## #5. Integrating BRT with Arterial HOV Facilities

- Arterial BRT for Santa Clara County (Kevin Fehon)
- Rapid Bus or Rapid Busway on Wilshire Blvd. (John Stutsman)
- BRT Travel Time Savings from Signal Preemption & Reuse of Underused Arterial lanes (Rob Klein)
- Traffic Control & Transit Priority: San Fernando BRT Project (Brent Ogden)

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**#8. Transit Priority Treatments in King County**

- Development of a Business Access & Transit Lane concept for the Aurora Avenue project (Tim Bevan)
- Arterial BRT Plan Development (Matt Shelden)
- TSP Interactive Model (John Toone)
- King County Signal Priority Program (Ron Atherley)
- Evaluation of Signal Priority on Aurora Ave. (David Canty)

**#11. BRT – Flavor of the Month or Long-term Solution?**

- What's the Buzz about BRT? (Michael Baltes/Dennis Hinebaugh)
- The FTA Perspective on BRT (Rich Krochalis)
- Lessons Learned in development of BRT Planning and Implementation Guidelines (Scott Rutherford)
- BRT Interest in Charlotte, NC (Bill Finger)
- BRT: A long-term solution in inter-modal transportation planning (Greg Moscoe)

**#17. BRT Corridor Studies**

- HOV Lanes on the Long Island Expressway: When Carpools aren't enough, think BRT (Marvin Gersten)
- BRT and Arterial HOV Planning in Smaller Urban Areas – the SR 303 Corridor Study Experience (John Perlic)
- HOV, HOT & BRT Analysis in Portland, OR (Randy McCourt)
- Bus Rapid Transit & Alternatives Analysis (Roderick Diaz)

Many of the BRT presentations will be available on-line at the Bus Systems Committee website at:  
**<http://TRBbustransitSystems.NCTR.usf.edu>**

The conference organizers wish to thank the TRB Bus Transit Systems Committee members who presented papers, served as session moderators, and contributed to the enlightening session discussions that helped make the conference a success.



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