The National BRT Institute (NBRTI) has been established as a collaborative effort between CUTR and the Institute for Transportation Studies at the University of California at Berkeley. The mission of the Institute is 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. This will be achieved by using advanced technologies and methodologies developed in the field of ITS, bus, and rail systems.

The National BRT Institute will employ a series of resources including workshops, conferences, publications, research, and knowledgeable staff to support the goals of the Institute. To date, CUTR has worked with SpeedLink (a proposed BRT system in the Detroit Metropolitan Area) as a member of its technical advisory committee and as a member of the advisory committee for the BRT Vehicle Design and Planning Competition that presented awards for innovative BRT vehicle and system design. Also, CUTR conducted a detailed presentation about BRT systems in comparison to other bus and rail modes to the Central Jersey Transportation Forum (CJTF) located in Princeton, New Jersey. The CJTF was formed in January 1999 as a commitment to address issues and concerns of the Delaware Valley region, the Greater Philadelphia region to the south, the North Jersey Transportation Planning Authority, and the

Continued on next page
Greater New York region to the north. The CJTF provides a unique opportunity to bring together many regional organizations with a stake in the transportation system.

CUTR is currently conducting performance evaluations of two separate BRT systems in Florida. The first is an evaluation of the LYNX LYMMO project in Orlando, a downtown circulator that began operation on August 4, 1997. The service comprises exclusive lanes for the entire 2.3 mile route; signal pre-emption; stations with large shelters and route information; automatic vehicle location; next-bus arrival information at kiosks; low-floor compressed natural gas buses; marketing and image development through vehicle graphics, stations, advertisements, and business tie-ins; and free fares to speed boarding due to no fare collection delay. The second is the South Miami-Dade Busway, a two-lane, bus-only roadway constructed in a former rail right-of-way adjacent to a major arterial (US 1). The eight-mile, 15-station busway was opened by the Miami-Dade Transit Authority (MDTA) on February 3, 1997. An 11.5-mile extension south is currently planned.

As part of the Institute’s technology transfer activities, CUTR staff have participated as speakers, moderators, and conference organizers for BRT workshops in Pittsburgh, Miami, and Puerto Rico and as participants in the most recent tour of the BRT system in Curitiba, Brazil. CUTR also is a member of the American Public Transportation Association’s Bus Rapid Transit Taskforce.

A collaborative relationship was recently established with the W. Alton Jones Foundation to further the objectives of the Institute and the Foundation and to monitor and report on the progress of the use of alternative fuel sources for BRT systems. In addition, a collaborative relationship also has been established with Hennepin County (Minneapolis) to perform BRT-related technology transfer activities including workshops, conferences, seminars, publications, and research. CUTR will act as an extension of Hennepin County staff to disseminate knowledge about BRT to a variety of local and national audiences.

In support of the BRT concept and the establishment of the Institute, the Federal Transit Administration and the Florida Department of Transportation continue to support the National BRT Institute with funding for research, evaluation, and technology transfer.

For further information, contact the National Bus Rapid Transit Institute codirectors Dennis Hinebaugh, (813) 974-9833, hinebaug@cutr.usf.edu, or Wei Bin Zhang, (510) 231-9538, wbzhang@its.berkeley.edu.

Passenger comfort on BRT vehicles is enhanced by the use of wide aisles and spacious seating.

CUTR was created by the Florida Legislature, the Florida Board of Regents, and the University of South Florida to find cost-effective, state-of-the-art solutions to transportation problems. CUTR’s expertise in policy analysis, planning, engineering, economics, geography, safety, and communications offers innovative solutions to public and private sector organizations nationwide.

For more information, contact:
Dr. Edward A. Mierzejewski, Director, CUTR
College of Engineering, University of South Florida
4202 E. Fowler Ave, CUT103, Tampa, FL 33620-5375
(813) 974-3120, fax 974-5168
E-mail: pball@cutr.usf.edu
http://www.cutr.usf.edu
A comparative analysis of taxicab meter rates in Hillsborough County

In an effort to provide Hillsborough County’s citizens with the highest quality of taxicab service, the Hillsborough County Public Transportation Commission (HCPTC) identified the need to assess and improve standard taxicab fares and charges, the number of taxicab licenses, and operators’ interests.

CUTR was contracted by the HCPTC to perform an analysis of taxicab meter rates with a focus on airport services. The intent was to compare Hillsborough County’s taxicab fares schedule to other statistically comparable cities, both in Florida and in the rest of the U.S., and to provide a basic framework that could be used to review and update taxicab fares on a regular basis.

Comparing rates of Hillsborough County with rates in other cities or counties is valuable in two ways. First, it compares whether rates in Hillsborough County are in line with national and state levels. Second, it could provide insight on how Tampa’s rate schedule addresses service delivery problems common to all cities.

As part of this study, HCPTC directed CUTR to conduct a taxicab drivers’ survey to assess any particular pattern for trips and relative fares, with a focus on trips originating at Tampa International Airport (TIA). CUTR designed the survey and utilized econometric and statistical tools to estimate the distribution of relevant trips and relative fares.

Comparative rate analysis

Typically, taxi fares comprise an initial drop charge, a per mile rate charge, and a waiting-time charge. To conduct the comparative rate analysis, CUTR implemented a methodology to select 10 peer in-state locations and 10 out-of-state locations whose characteristics most closely resemble those of Tampa and Hillsborough County. A total of 65 counties were identified and incorporated in a matrix to run a cluster analysis for final selection of peer locations. The table below shows the selected out-of-state and in-state cities with their respective fares.

At $1.25, Tampa has the lowest drop charge of both the out-of-state and in-state samples (together with Ft. Lauderdale and Jacksonville) and is well...

<table>
<thead>
<tr>
<th>County</th>
<th>City</th>
<th>Initial Drop Charge</th>
<th>Meter Rate</th>
<th>Waiting Charge/ Minute</th>
</tr>
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<tbody>
<tr>
<td>Baltimore</td>
<td>Baltimore</td>
<td>1.80</td>
<td>1/7</td>
<td>1.40</td>
</tr>
<tr>
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<td>Charlotte</td>
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<td>1/8</td>
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</tr>
<tr>
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<td>1/16</td>
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</tr>
<tr>
<td>Hamilton</td>
<td>Cincinatti</td>
<td>2.60</td>
<td>1/8</td>
<td>1.60</td>
</tr>
<tr>
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<td>Milwaukee</td>
<td>1.75</td>
<td>1/8</td>
<td>1.60</td>
</tr>
<tr>
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<td>1/7</td>
<td>1.75</td>
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<tr>
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<td>1/7</td>
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<tr>
<td>O klahoma</td>
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<tr>
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<td>N ashville</td>
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<td>Kansas City</td>
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<td>1/8</td>
<td>1.60</td>
</tr>
<tr>
<td>Hillsborough</td>
<td>Tampa</td>
<td>1.25</td>
<td>1/5</td>
<td>1.75</td>
</tr>
</tbody>
</table>

Average: 1.85 1.58 0.34

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<thead>
<tr>
<th>County</th>
<th>City</th>
<th>Initial Drop Charge</th>
<th>Meter Rate</th>
<th>Waiting Charge/ Minute</th>
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</thead>
<tbody>
<tr>
<td>Dade</td>
<td>Miami</td>
<td>1.50</td>
<td>1/8</td>
<td>2.00</td>
</tr>
<tr>
<td>Palm Beach</td>
<td>W. Palm Beach</td>
<td>2.00</td>
<td>1/5</td>
<td>1.25</td>
</tr>
<tr>
<td>Broward</td>
<td>Ft. Lauderdale</td>
<td>1.25</td>
<td>1/6</td>
<td>2.00</td>
</tr>
<tr>
<td>Pinellas</td>
<td>St. Petersburg</td>
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<td>1/4</td>
<td>1.60</td>
</tr>
<tr>
<td>Orange</td>
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<td>2.00</td>
<td>1/7</td>
<td>1.75</td>
</tr>
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<td>Duval</td>
<td>Jacksonville</td>
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<tr>
<td>Volusia</td>
<td>Daytona Beach</td>
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<td>1/11</td>
<td>1.65</td>
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<tr>
<td>Collier</td>
<td>N aples</td>
<td>Fare regulated by zone</td>
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<td>Fare regulated</td>
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<td>Lee</td>
<td>Fort Myers</td>
<td>Fare regulated</td>
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<td>Fare regulated</td>
</tr>
<tr>
<td>Hillsborough</td>
<td>Tampa</td>
<td>1.25</td>
<td>1/5</td>
<td>1.75</td>
</tr>
</tbody>
</table>

Average: 1.69 1.65 0.29
below the sample average. At $1.75, Tampa’s per-mile rate is in line with the two samples, but higher than the sample averages.

The methodology developed to select the in-state and out-of-state cities provides a framework that HCPTC can use to periodically evaluate Hillsborough County’s taxicab fares structure with comparable cities in Florida and the U.S.

**Taxicab drivers’ survey**

CUTR also was asked to conduct a taxicab drivers’ survey to assess any particular pattern on trips and relative fares, with a focus on trips originating at Tampa International Airport. Sixty-four drivers out of a population of 467 active operators were randomly chosen and surveyed during the last two weeks of August 2001.

CUTR made use of the most advanced econometric/statistical tools available to analyze data from the survey. In particular, data-driven nonparametric kernel density estimation techniques were used to estimate taxicabs’ joint trip-fare density distribution to ascertain any existing behavior of taxicab operators. No, a specifically designed software program (and the first of its kind), was used to run the density estimation. (No was created and written by Dr. Jeffrey S. Racine at the USF Department of Economics, which allows performing a vast array of nonparametric analyses.)

The estimation was output in the form of a three-dimensional graph, representing the joint density distribution estimate for trip length (measured in miles) and relative fare (measured in $) for 2,338 observations from the taxicab drivers’ survey. It was immediately striking how misleading it would have been to assume a unimodal or typical bell shape for this type of density, especially if statistical inference testing had been conducted to estimate population parameters. What was revealed was a bi-modal density distribution with two distinct modes, which provided a very good picture of the taxicab business at TIA.

As a result, it can clearly be stated that, if full information on all trips originating at TIA could be obtained, this is the density distribution that would eventually be revealed.

The behavioral patterns of taxicab drivers operating mainly at TIA, in terms of trips taken, were graphically depicted, revealing that taxicab drivers’ trips tend to be concentrated on two main clusters, first at a 4-5 mile distance from TIA with a relative fare of $8-10, and second at an 8-10 mile distance from TIA and a relative fare of $18-20.

CUTR presented the findings of the study at the bimonthly meeting of the Hillsborough County Public Transportation Commission in October 2001 at which the County expressed an interest in extending the study to the overall industry to include alternative services such as the limousine services industry. A final report was produced in November 2001.

For further information on the study or to obtain a copy of the final report, contact CUTR Research Associate Sisinnio Concas, concas@cutr.usf.edu, (813) 974-7760.
Commuter Choices Certificate Program offered

CUTR is now offering a Commuter Choices certificate program for transportation professionals working on traffic congestion, air quality, and mobility problems. The certificate program examines a wide range of strategies that influence travel behavior by mode, time of day, cost, or frequency to reduce traffic congestion and air pollution and enhance mobility. The certificate program focuses on specialized skills associated with designing, implementing, maintaining, and evaluating commuter choice programs that work.

In addition, the program will offer Continuing Education Units (CEUs) for professionals in other fields such as transportation planning, transportation engineering, and public administration; educators in environmental sciences; employee transportation coordinators; and others in transportation-related fields.

The Commuter Choices professional training program is sponsored by the Florida Department of Transportation. CUTR has been offering a variety of similar training workshops since 1994; however, this new certificate program has evolved with the changing transportation landscape. Based on past experience, a review of similar programs, and feedback from transportation professionals around the country, this new program has been designed to respond to learned challenges and takes advantage of anticipated opportunities to fill a national void.

The main features of the new program include development of a standing menu of modules that will be updated on a regular basis, provision of on-line modules, and granting of a certificate including the option for earning CEUs. The program has been expanded to 152 hours of course offerings, which are divided into clusters and modules. Each cluster constitutes a variety of topic specific modules with varying lengths ranging from one to 16 hours. The six clusters include:

• Introduction to Commuter Choices
• Commuter Choices Tools
• Commuter Choices Planning Process
• Commuter Choices Marketing Aspects
• Commuter Choices Management Process
• Commuter Choices Public Policy Implications

Program Objectives and Organization

Upon completion of the program, certificate candidates are expected to be able to:

• identify and define the various commuter choices, principles, and applications;
• describe and apply the commuter choices planning process;
• explain commuter choices applied marketing relationships;
• comprehend the fundamentals of commuter choices program management; and
• discuss the implications of commuter choices programs on public policy.

Each of the six clusters constitutes several modules focusing on a variety of specific stand-alone topics. Modules are taught by a CUTR specialist or subcontracted to an outside specialist. Each module design includes four basic components: 1) the topic’s context in relation to Commuter Choice, 2) pertinent service concepts and/or principles, 3) related technical and application aspects, and 4) relevant policy implications. The training process includes lectures, work on real projects.
and case studies, class activities, and use of electronic technology.

The program is designed to meet professional development needs for most transportation organizations and interests including commuter assistance program staff; Transportation Management Association staff and board members; transportation consultants; officials from transit agencies, DOTs, MPOs, and other transportation organizations; and other practitioners in related fields. The program is offered through the University of South Florida’s Educational Outreach Program, and the noncredit certificate is awarded to participants who complete modules in the two core clusters and elective modules from the other four clusters within a two- to three-year period. A total of 80 hours is required for certification. Participation does not require a college degree. Non-certificated participants are also welcome and may enroll in individual modules of interest or modules that meet the CEU requirements of their professional society.

A National Highway Traffic Safety Administration evaluation of Florida’s motorcycle safety program led to the recent development of a comprehensive Florida Motorcycle Safety Strategic Plan (FMSSP). The February 2000 review by a multi-disciplinary team of national experts on motorcycle safety recommended that the plan address the issues of rider training, impaired riding, helmet and protective gear use, unlicensed riders, and motorist awareness.

The FDOT Safety Office contracted with CUTR to help develop the strategic plan that would guide future motorcycle safety efforts and help assess the effectiveness of activities and resources directed toward improving motorcycle safety. Key stakeholders concerned with improving motorcycle safety in Florida, including the FDOT, the Department of Highway Safety and Motor Vehicles, the Florida Rider Training Program, the Florida Department of Health, law enforcement, motorcycle clubs, dealers, educators, and other motorcycle safety interest groups participated in a two-day strategic planning workshop held at CUTR in April 2001.

Participants representing a wide variety of interests and areas of expertise developed a mission statement; prioritized safety issues related to rider training, impaired riding, helmet and protective gear use, unlicensed riders, and motorist awareness; and identified goals, objectives, strategies and initiatives specific to these issues. The FMSSP also identifies the benefits of achieving the goals; potential partners and their roles to help achieve the goals; and resources available to achieve goals.

The Plan’s major goals included reducing the number of crashes, injuries and deaths involving motorcyclists; improving the skill levels of motorcyclists; enhancing public support for motorcycling in general; and promoting the safe operation of motorcycles.

“The Plan presents some very plausible countermeasures that can be implemented in order to mitigate the number of injuries and deaths of motorists and pedestrians impacted by motorcyclists,” said Gene Hall, FDOT Traffic Safety Specialist and FDOT Project Manager.

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Public transit access to private property studied

Transit agencies often have difficulties convincing private property owners (regional malls, strip centers, office parks, etc.) to locate a bus stop on their property. Most transit agencies have been asked to remove an existing bus stop at the request of a property owner or manager. Some property owners fail to see the economic benefits of transit service and cite negative impacts, such as loitering and littering, as reasons for removal.

But serving regional shopping centers and office parks from the street can cause excessive walking distances and safety problems for transit patrons, as well as delays and hazards for vehicular traffic. Additionally, when a regional shopping center is used as a transfer center, relocation can be costly and cause passenger inconvenience.

Legal settlements resulting from safety issues can also be costly as well. Perhaps the most notorious lawsuit regarding this issue is a wrongful death claim brought after a 17-year-old single mother was hit and killed by a dump truck while trying to cross a seven-lane highway to get to her job at the Walden Galleria Mall in suburban Buffalo, New York. The bus she took to work had been prohibited from stopping in the mall parking lot.

The family filed a lawsuit against the shopping mall owners, the transit agency, and the company that owned the dump truck. The defendants assumed no liability in the woman’s death, but all will contribute to the settlement of $2.55 million: $2 million from the mall owners; $250,000 from the dump truck owner; and $300,000 from the transit agency.

Under contract with the Florida Department of Transportation (FDOT), CUTR was asked to assess issues surrounding the legal rights of public transit agencies to enter and serve private property and to identify concerns of private property owners as they relate to allowing public transit access to their property. The study also included the development of guidelines for negotiating transit access to private property.

Surveys

To identify successful and unsuccessful transit access practices, two surveys were distributed — one to public transit providers and another to private property developers, owners and/or managers (hereinafter referred to as “owners”). Similar questions were asked of both groups.

One of the first questions on the transit agency survey asked if they had ever received a request to remove a bus stop from a private property location. A total of 87 percent of respondents indicated they had, and 50 percent estimated that they received more than five requests. In contrast, only 25 percent of the responding private property owners stated that they had made such a request.

When transit agencies were asked to identify why they believed access to private property was denied, the top four responses were:

- loitering,
- vehicle weight (destruction of pavement),
- crime, and
- physical constraints.

Private property owners indicated similar responses, citing the following reasons for not wanting transit access:

The Citrus Connection in Lakeland, Florida, has been successful in negotiating on-site bus stops at several shopping centers.
The surveys also asked about incentives offered to improve the cooperative working relationship between a private property owner and the local transit agency. Transit agencies were asked to indicate which incentives they used, and private property owners were asked to indicate the importance of various incentives. Following is the ranking of responses from both groups.

Transit Agencies: Incentives Offered
- Install amenities
- Maintain on-site bus stops
- Periodic cleaning
- Install concrete pads

Private Property Owners: Incentives Desired
- Periodic cleaning
- Maintenance agreements
- Maintain on-site bus stops
- Install concrete pads

This clearly demonstrates how resolution can break down without good communication. If a transit agency or local government fails to offer incentives that a property owner deems most important, negotiations cease.

Another pertinent survey question asked if respondents were aware of state or local laws and/or ordinances requiring public transportation access to private property. Most of the respondents from Florida transit agencies indicated an awareness of laws, and 92 percent indicated their participation in the site plan review process. Except for St. Louis Regional Transit, no transit agency outside of Florida was aware of laws governing transit access to private property. Not even one private property owner admitted knowing about any laws or ordinances governing transit access.

Techniques for transit accommodation

Literature is abundant regarding design and regulation for transit-friendly communities; however, implementation for existing development requires changing community goals to focus on transit and would involve modifying long range plans, zoning, and development regulations.

Several techniques can be used to obtain transit accommodations on private property, with consideration given to whether the property is developed or undeveloped. Most regulatory methods and regulatory-type incentives (generally specified in a development order) will be exercised on undeveloped or redeveloped properties.

Non-regulatory incentives (usually in the form of agreements, easements and leases) will, most often, occur with developed properties. Whenever possible, non-regulatory incentives should be made with the owner, rather than the management company, to ensure an extended effective agreement period and to maintain the terms when a change in management occurs.

Regulatory methods require certain actions, while non-regulatory methods encourage or drive desired actions. Regulation often increases the cost of development without providing a measurable economic return, while non-regulatory methods, such as incentives, provide a benefit that is equal to or greater than the cost of receiving it. It is also necessary to develop policies that will dictate how and when methods are applied. Using a full range of powers is most likely to accomplish a desirable outcome, while obliging all affected parties.

Summary

Some of the most significant issues identified by private property owners related to allowing transit access on the property included loitering, physical constraints of the site, and the weight of the transit vehicle. Accordingly, private property owners identified their most important incentives as providing periodic cleanings of the site and maintenance agreements.

To effectively negotiate agreements with private property representatives, public transit agencies should define the role they are willing to play in alleviating these concerns. It is also important to remember that other parties will often be included in negotiations, such as the city or county. In short, communication and coordination lead to cooperation.

For further information on the project, contact CUTR Senior Research Associate Laurel Land, land@cutr.usf.edu, (813) 974-1446.
Florida’s Statewide Transit Technical Assistance and Training Program

The Florida Statewide Transit Technical Assistance and Training program is a joint partnership between the Florida Department of Transportation and the National Center for Transportation Research (NCTR) at CUTR. This program is entering its third year and has provided Florida’s public transportation agencies with on-site technical assistance and short-term technical support in a variety of issue areas. In addition, the program has provided professional development activities and training sessions to more than 320 of Florida’s public transportation employees.

The primary objective of the technical assistance element of the program is to provide Florida’s transit agencies with on-site technical assistance, such as presentations and workshops with local city or county commissions, transit agency policy boards, metropolitan planning organizations, or community groups and organizations on a broad range of transit related subjects, and non-recurring short-term technical support, such as preparing technical reports and/or “white papers.” To date, CUTR staff have responded to a number of requests from transit agencies all across Florida.

The primary objective of the training component of the program is, in coordination with the FDOT and the Florida Public Transportation Association (FPTA), to annually develop a list of critical transit training needs based on responses received from a survey of Florida’s transit agencies. A training curriculum is then developed or the program contracts with nationally-recognized trainers and agencies such as the Transportation Safety Institute and the National Transit Institute to provide critical training or professional development opportunities. In addition, the program is responsible for coordinating and planning for the annual FPTA/CUTR professional development workshops.

One recent development within the training component of the program has been the opportunity to work directly with the Transportation Safety Institute and James Tucci of K & J Consulting Services to make transit agencies aware of the issue of transit terrorism and provide guidance on how to effectively prepare for incidents of terrorism. TSI and Mr. Tucci will continue to work with CUTR to bring additional training opportunities to Florida’s transit agencies on transit security and system safety.

Upcoming training sessions include:

• “FPTA/CUTR Professional Development Workshop,” June 10-12, 2002
• “Bus Collision Investigation/Prevention Seminar for Managers,” June 11, 2002 (held in conjunction with the FPTA/CUTR Professional Development Workshop)
• “Bus System Safety,” August 5-9, 2002

According to Ed Coven, Manager of the FDOT Office of Public Transit, “The Statewide Transit Technical Assistance and Training Program provides a flexible way to address the ever-changing needs of the transit industry in Florida. We’re pleased that so many systems are taking advantage of and benefitting from the program.”

For further information on the Florida Statewide Transit Technical Assistance and Training Program, contact CUTR Research Associate Amber Reep, reep@cutr.usf.edu, (813) 974-9823, or Program Director Lisa Staes, staes@cutr.usf.edu, (813) 974-9787.
new bus service concept that includes all the high-tech options more commonly associated with light rail systems.

What is BRT? Basically, BRT can be defined as a fully integrated, bus-based “rapid” transit system typically utilizing highly flexible service and advanced technologies to improve customer convenience and reduce delays. It combines most of the qualities of light rail transit with the flexibility and lower operating, maintenance, and capital cost of buses. BRT vehicles can operate on exclusive travel ways, HOV lanes, expressways, or ordinary roadways in almost any dense urban environment. In addition, BRT can combine intelligent transportation systems (ITS) technology; traffic signal priority; rapid, limited stop service; clean, quiet, and aesthetically pleasing vehicles; enhanced shelters and stops; rapid and convenient fare collection; and facilitated integration with existing and future land-use policy. The following features typically characterize a BRT system:

- exclusive travel ways
- modern stations
- higher-tech vehicles
- rapid service
- automated fare collection
- ITS technologies
- lower costs

Exclusive travel ways
A “travel way” is the path along which a BRT vehicle operates; the use of an exclusive travel way is what distinguishes BRT from standard local transit service and helps give it a higher-than-standard-bus speed, reliability, and identity. Some of the types of travel ways that can be used include exclusive transit way, HOV lanes, dedicated transit lanes, mixed traffic, contraflow lanes, and queue jumper lanes at signalized intersections. In some BRT applications, the travel way is color-coded or has special pavement markings to enhance its distinctiveness.

Modern stations
BRT system stations can range from standard shelters to large transit centers, depending on the character and/or the density of the community in which the BRT operates. BRT stations often are tied to major activity centers such as malls, business parks, and downtowns, and even can be located “off-line” from the travel way. Typically, station design further promotes fast, efficient BRT service by reducing vehicle dwell time. One of the major ways that this is accomplished is by speeding up the passenger boarding and alighting process by using raised platforms for no-step passenger movement on and off the vehicles. BRT stations also utilize signage and graphics to differentiate and make them stand out from standard bus stops. In addition, BRT stations also can include real-time passenger information displays and provide opportunities for other customer services.

Higher-tech vehicles
BRT vehicles are designed to improve passenger comfort and safety as well as increase service speed. Passenger comfort is enhanced by the use of wide aisles and spacious seating configuration; service speed benefits from the low-floor design of vehicles, and the availability of multiple double-wide doors for faster passenger throughput. BRT vehicles can be friendly to the environment through the use of alternative fuels and propulsion systems and noise and air pollution reduction technologies. Depending on the local need and the planned functions, BRT vehicles are available in a variety of sizes and configurations. Busier urban corridors may require the use of articulated or even bi-articulated vehicles, while lower density suburban service may require only smaller vehicles.

Rapid service
Given the flexibility of BRT, there are many service options from which to choose that will best meet the needs of the transit customer. For example, local and express service can parallel one another along the same BRT corridor, thereby increasing travel options in the corridor. “Skip-stop” routes are also popular for BRT application, where the vehicles stop only at selected stations along the line. This is yet another technique that helps promote increased operating speeds. Ultimately, the higher speed and reliability of BRT service are among its primary attributes that benefit customers. When combined with high frequency, these particular characteristics show the need for time schedules and perhaps maps due to the certainty and directness of the service.
Automated fare collection

Typically, the fare payment process slows down the operation of standard local bus service where each customer pays as they board through a single front door. This is especially the case when fare collection policy requires exact change or does not permit the use of passes or other fare media that can aid in speeding the boarding process. Ironically, the higher the ridership on this type of bus service, the greater the problem is as each additional customer adds delay. To ensure the speed and convenience of its service, BRT systems make use of fare collection methods that help decrease dwell time and make the fare payment process as simple as possible for the customer, such as cashless fare payment systems, electronic smart cards, or “proof of payment.”

ITS technologies

Providing information to customers is a crucial part of providing reliable, efficient, and convenient BRT service. A customer arriving at a stop or station should be able to readily find information about routes, the hours and frequency of service, a system map, and other pertinent information. Although this type of static information is useful, real-time information is even more valuable to customers. Such information requires the use of ITS technologies such as an automatic vehicle location (AVL) system to track the exact location of vehicles in the system. The information from the AVL system then can be converted into vehicle arrival times that can, in turn, be displayed in real time to customers at stations, kiosks, Internet/radio/television, or transmitted over information networks.

Cost comparisons to light rail transit

Depending on the type of system being built and the degree of phase-in, BRT systems can have lower capital costs yet offer similar performance when compared to light rail. BRT system capital costs could include the cost of right-of-way, stations, park-and-ride facilities, communications and improved traffic signal systems, improvements to existing roadways, and vehicles, if additional or special buses are needed.

For further information, contact CUTR Research Associates Michael Baltes or Joel Rey at (813) 974-3120, baltes@cutr.usf.edu or rey@cutr.usf.edu.

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<th>Comparisons of BRT and LRT</th>
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<td><strong>Statistics</strong></td>
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<tr>
<td>Right-of-Way Options (ROW)</td>
</tr>
<tr>
<td>Station Spacing</td>
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<tr>
<td>Vehicle Seated Capacity</td>
</tr>
<tr>
<td>Average Speed</td>
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<tr>
<td>Pass./Hour/Direction (exclusive ROW)</td>
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<tr>
<td>Pass./Hour/Direction (arterial)</td>
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<tr>
<td>Capital ROW Cost/Mile</td>
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<td>Capital Cost/Vehicle</td>
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<td>O perating &amp; Maintenance/ Service Hour</td>
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Source: SpeedLink—A Rapid Transit Option for Greater Detroit, June 2001
Motorcycle Safety — continued from p.6

Some of the most promising avenues to achieve these goals include public awareness and education. For example, expanding training modules on alcohol awareness and motorcycle safety issues can help reduce alcohol-involved crashes and improve riding skills. Distributing printed brochures, handouts, and posters that promote motorist awareness of motorcycles can enhance public support and awareness. Safe motorcycling can be improved by promoting the use of protective gear, such as helmets, eye-gear, jackets, suits, gloves and boots among motorcyclists, and by educating riders about training opportunities and licensing requirements.

Participants also identified a number of other partners to work with to implement the FMSSP, including the beer/alcoholic beverage industry, community traffic safety teams, hospitality establishments, engineering and public works associations, Mothers Against Drunk Drivers, Recording Artists, Actors & Athletes Against Drunk Driving, motorcycle dealers, clubs, and organizations, and motorcycle bike and equipment manufacturers.

Participants agreed that several resources could be utilized to accomplish Plan goals, such as the media, schools, and licensing offices. To facilitate implementation, participants recommended that the State establish a subcommittee on motorcycle safety as part of the Florida Safety Management System Steering Committee to provide a forum for coordinating safety efforts, monitoring Plan implementation, and modifying the Plan as needed.

The FMSSP outlines proactive approaches that can be employed by all interested parties to create a safer environment for all Floridians, including motorists, motorcyclists, pedestrians and bicyclists. As a result, the partners, audiences, and strategies identified and targeted in the Plan create opportunities for future programs to achieve a specified set of goals. “Ultimately, if the FMSSP is executed in its entirety, the vision of continued declines in motorcycle injuries and fatalities in Florida will be achieved regardless of the status of future laws that will come before the Florida Legislature,” said Hall.

For further information, contact CUTR Senior Research Associate Patricia A. Turner, turner@cutr.usf.edu, (813) 974-3276.