IMPLEMENTATION

implementation of brt

To succeed and thrive in Newark, BRT's development will require leadership and coordination. A well designed system is the product of relationships between three constituencies: communities, agencies and governments. And of the three, the community's broad support will make the biggest difference; the degree of their involvement will determine whether BRT is a simply adequate system, or a great one. A successful design process should seek guidance from communities both within the City and beyond, ones represented by neighborhood and community groups, non-profits and universities. Only communities can develop true brand loyalty. BRT has turned Curitiba from a provincial city to a destination for governments and agencies seeking to improve how they operate. The state and federal agencies, which will ultimately fund the work, should be coordinated with development at the earliest opportunity. Finally, governments at all scales - neighborhood, city, county and regional - should take the baton of leadership from the communities to petition state and federal agencies. The prior sections of this report described how BRT can work in Newark and what its potential can yield. This section lays out a path towards implementation and is organized around the three constituencies who can implement it.

communities

city of newark

The riders who take the 205,000 daily trips in the City form a community of their own, one that represents a majority of the City's population. They can consider themselves as "shareholders" in a larger body who have a say in how it is run. Community organizations both within the City and beyond; informed by the higher educational community, through studies such as this one; can lead this majority to vote for the BRT that they want. Newark has a long tradition of transit's role in community building, which dates back to the days of the trolleys. This past can lay a firm foundation for a BRT's community growth in the future.

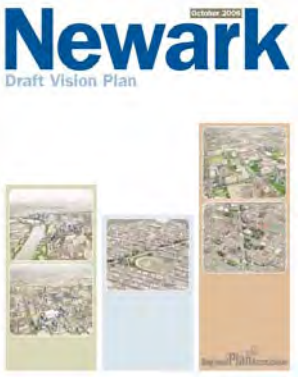
The mission statement of this study is to "become the charter for the community driven body that will best assure that BRT will become unique to Newark and remain a lasting asset for the City." Since this university-based study was funded by the business community and supported by a range of community groups and nonprofit organizations, the community's part in developing BRT has already begun. The next steps are as critical as the first.

Newark's Community Development Corporations (CDCs), which are active in each of the City's neighborhoods, should be made aware of NJ Transit's BRT developments in Newark and its plans for the future. LISC (Local Initiatives Support Corp of Greater Newark & Jersey City) is a contributor to this study and can coordinate these efforts in the future. Additional funding can be sought from non-profits such as the Tristate Transportation Campaign and regional transportation authorities such as the New Jersey Transportation Planning Authority (NJTPA) through their concept and development programs. NJIT's work with Crest CDC in 2000 in the Springfield Avenue neighborhood ultimately led to the Go Bus deployment eight years later.

LISC Local Initiatives Support Corporation
Helping neighbors build communities

adjoining communities

BRT can and must go beyond Newark's boundaries. With few exceptions, all routes proposed in this study go beyond the City limits and terminate at logical locations: transit hubs or other nodes such as retail developments. NJ Transit's Go Bus initiatives (including Liberty Corridor) are consistent with this strategy, taking riders to the Irvington Bus Terminal and the Bloomfield Train Station. The future leaders of this effort should reach out to the communities throughout Essex County and beyond that will benefit from BRT and involve them in that process.



www.rpa.org

non-profits

The Regional Plan Association (RPA), the nations' oldest non-profit organization devoted to regional planning, has been involved with Newark since the beginning of the Booker Administration. Concurrent to this study, the RPA has been examining the opportunities that a region wide convention center located adjacent to the Airport Train Station hold for Newark and the region. Studies of this nature should be welcome and coordinated with BRT development. At the broader level, the National Bus Rapid Transit Institute (NBRTI), located at the University of South Florida, has been a contributor to this Newark BRT study and has provided up-to-date guidance regarding the planning and technological development of BRT. They should continue to do so. Other non profits that can assist in the process should be actively sought out.

universities

Both NJIT and Rutgers University have a long involvement with planning support for the City of Newark. Each of the disciplines involved with developing BRT – engineering, planning and architecture - are well represented by Newark's universities. These departments can continue to support the advancement of BRT by doing what they do best: seeking out new knowledge, testing its applicability, and imparting it to others. They can be of great service to the City and NJ Transit in making BRT in Newark the best that it can be. The universities should remain active research partners in the process and should seek long term research funding in order to do so.

Moreover, the universities in Newark, with over 40,000 students and faculty, many who live here, are important residents of the City. Their embrace of BRT can further boost ridership. Both Rutgers and NJIT are in preliminary discussions with NJ Transit to promote student and staff usage of the transit system. Other programs in Boulder CO and Davis CA, communities that both host large universities, have succeeded in dramatically increasing transit usage and limiting automobile congestion. Integration of BRT with these ongoing collaborations could bring these arrangements to fruition.

IMPLEMENTATION

branding

This report argues that Newark's greatest advantage in developing BRT is its already extraordinary high bus ridership, one that is the envy of many other cities. It can be said that riding the bus is part of the culture of Newark. The relationship between usage and culture is commonly referred to as branding.

NJ Transit has actively solicited the community to develop a brand for the Go Bus. The effect has been to tailor the service to a community's needs and give it a unique image through color and materials, even the driver's uniforms. The name Go Bus resulted from this process. Similar efforts were conducted by NJIT faculty and students in a focus group at La Casa de Don Pedro that examined the stations along Bloomfield Avenue to be served by the Go Bus. The La Casa effort provided unanticipated information, such as local traffic behavior that can be otherwise invisible to other forms of monitoring.

The purpose of branding is subtle yet critical. BRT branding seeks to replace negative associations regarding buses with positive ones. Buses are still seen by many as the transportation choice of last resort. And in truth, in the past they were slow, unpredictable and uncomfortable. BRT, when advanced to its most developed form, offers a new mode of travel that bears no relationship to these older buses except that both run on rubber. Given that the old associations are still difficult to erase, a sustained effort is required to argue that BRT is indeed different. When these arguments come from members of the community, and not someone outside of it, they have the greatest impact.

Extensive community outreach can lead to a unique "brand" of BRT in Newark

BRT is often attacked by those who do not support mass transit, or by those who support only more expensive service like Light Rail. Although, this report makes the case why these arguments can be misleading, this debate will still likely continue for some time. Some still call BRT "poor man's light rail", saying that it is simply a bus masquerading as light rail and yet another form of social injustice when deployed in poor communities. In fact, a high ranking Newark official, who was a strong supporter of BRT, remarked during the RPA's Visioning process that the acronym must be changed because someone would undoubtedly start calling it "black rapid transit." This form of negative branding emanates from social injustice charges that are technically and fiscally indefensible, but they should never be taken lightly as they may take on momentum. It is best rebutted when members of the community, who have been involved with the process and feel a sense of pride for, and ownership of, Newark's BRT, stand up and say: no; this is not true. This is perhaps the greatest purpose of brand loyalty.

Successful BRT development is typically a grass-roots effort that starts in the neighborhood and integrates with many other communities that include non-profit organizations and universities. This form of leadership should be encouraged and sustained to make BRT truly unique to Newark and a point of pride for the City.

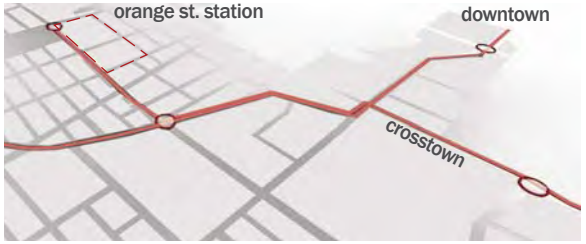
agencies

nj transit

At the final assembly of the Newark Visioning session, NJ Transit pledged to begin BRT service in Newark and honored that commitment with the arrival of the Go Bus in the spring of 2008. The total budget for the Springfield Avenue Go Bus was approximately $3 million. NJ Transit continues its commitment with the development of the Bloomfield Go Bus, originally known as the Liberty Corridor Bus Rapid Transit. When completed in the fall of 2009, this service will connect Newark's neighborhoods and workforce to downtown Newark, Newark Liberty International Airport and other destinations. Funding for this project was procured by Senator Robert Menendez as part of a $100 million Congressional earmark to provide New Jersey with economic development projects in the northeastern part of the state. The total amount for the Bloomfield Go Bus from the earmark will be $8 million with the state providing additional funding for stations. While the Springfield Go Bus currently has BRT features that are limited to express service and newly branded vehicles and stations, the Bloomfield Avenue service will be more robust with low floor vehicles and signal preemption in certain sections.

NJ Transit began Go Bus service in the spring of 2008

NJ Transit has and continues to show a strong commitment to BRT in Newark. The Newark-Elizabeth Comprehensive Bus Study is a parallel effort that is examining ridership and its origins and destinations in Newark and surrounding communities. Following the Bus Study, NJ Transit proposes that future BRT investments be made where high ridership already exists, on corridors such as Central Avenue or by upgrading Springfield Go Bus vehicles. This strategy is based entirely on existing ridership and does not take into account future development potential through land use changes in the City. A land use strategy would favor a Crosstown route (as this report does) connecting the Orange Street Station on the Newark Light Rail with University Hospital and the Airport. Vacant land along this route can provide opportunity for new development coordinated with BRT. These different strategies point to the fact that NJ Transit can only go so far in providing service that serves the City now and in the future. It will require a higher level of coordination with the City and other organizations to allow BRT to truly thrive.



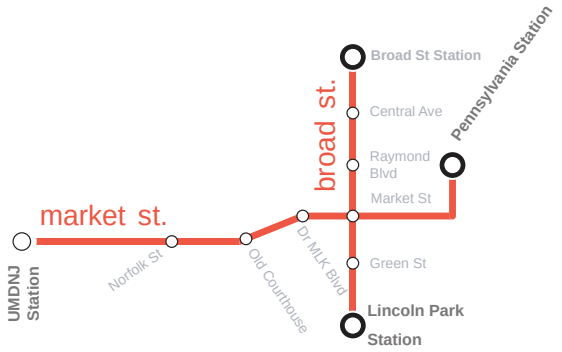
Crosstown service can bring new development to vacant land in Newark

federal transit administration

The mission of the Federal Transit Administration (FTA), a unit of the US DOT, is to support public transit through grant programs and policies with an annual budget of approximately $9 billion. New Starts is an FTA program that supports a variety of 'fixed guideway' projects including bus rapid transit. It is very competitive; only one fifth of the amount requested is granted annually. To develop a New Starts project in Newark, the FTA would need to partner with the North Jersey Transportation Planning Authority to pursue a regimented, multiyear development process that involves alternatives analysis, preliminary engineering, and final design before a construction agreement can be authorized. The FTA applies strict criteria to advance to each next phase. These criteria include mobility improvements, cost effectiveness, environmental benefits, planned operating efficiencies, land use planning, economic development and local financial commitment.

While the nature of federal funding may change, to develop a complete BRT network whose cost could range from $600 million to more than a billion dollars, the City of Newark would have to engage the FTA for some form of funding. The greatest drawback of FTA funding is that the environmental impact review and project justification process can drag out over many years. This pace voids the quick results that BRT offers. In light of this, NJ Transit plans to follow an ad-hoc process of BRT development that keeps a pace of brisk deployments that avoids lengthy government review. While this quick deployment strategy is laudable, it precludes BRT from rising beyond a certain level of development. If followed, a Newark BRT may never be able to take advantage of features such as dedicated lanes because any changes in street geometry could trigger lengthy environmental review.

Thus, the challenge of developing BRT in Newark will be to maintain the nimbleness of NJ Transit's strategy and combine it with a long term comprehensive plan that involves more advanced BRT elements supported by federal funding. One way to achieve this would be to seek FTA support for the complex project of BRT routing and stations in the downtown core while seeking other local funds for vehicles and other improvements that can be brought on quickly.



Federal investment in downtown corridors can bring on a technically advanced BRT without slowing the development of individual lines using local funds

governments

Governments serve as the intermediaries between the community and the agencies that will develop a BRT system. As this report stresses, support at the local level is the most critical in making BRT transcend the adequate and achieve broad success. In terms of influence, the typical chain of command is reversed: local leadership works its way up through the system. Local communities, represented by community organizations such as special improvement districts or business improvement districts, should convey their transit needs to their local City council representative. If the message from the different Wards in Newark is consistent, a group of councilmen can make the case to the Mayor and Council. The governing body will then charge the City's engineering and planning functions to advance BRT implementation. Because the BRT will travel almost exclusively on county roads, coordination with Essex County will be essential. Once coordination occurs, the City can make a direct case to the regional governments and authorities (e.g., NJ Transit) to advance a concerted case to state and federal governments.

transit improvement district

First proposed in the RPA's Newark Vision Plan, Transit Improvement Districts (TID) could be a new form of local government modeled on the business improvement district (BID) model. BIDs are public-private partnerships that typically provide services like trash removal, sidewalk maintenance, security, marketing, and capital improvements. They are governed by a board of directors elected by the property owners and require legislative authorization by the City to be chartered. The Ironbound Business Improvement District is a successful example of a Newark BID.

The very successful Ironbound Business Improvement District can be a model for Transit Improvement Districts

A TID would engage communities along corridors to help NJ Transit locate stops and assist the City to develop land use plans around station. The most important role of a TID in supporting BRT would be to maintain stations and ensure their efficient operation. TID maintenance workers would keep stops clean and immediately make any repairs. The presence of TID public safety officers would maintain a sense of security. TID officers in vehicles would closely coordinate with Newark Police and ensure that illegally parked or idling vehicles do not impede the smooth functioning of BRT vehicles. A TID could be governed by a board comprised of community and property owners, and like a BID, it could be funded through special assessments on commercial properties along the corridor. As Newark participates in New Jersey's Urban Enterprise Program, sales tax revenues generated within the corridor could be dedicated for use within it to support the BRT's function and offset the local assessments.

city of newark

Two components of Newark City government will play a leading role in guiding the mayor and council in developing BRT in Newark: the Division of City Planning and Community Development and the Department of Engineering. These will coordinate with Economic and Housing Development, Neighborhood and Recreational Services and Police, among others.

The role of City Planning and Community Development will be to serve as a liaison with NJ TRANSIT operations planning staff, guide growth around transportation improvements, and provide the necessary land use regulations to do so. Coordination with each BRT community in the City's five wards, in an open and transparent manner, will be essential for an effective land use planning process. The Division also has a specific responsibility for the economic and physical planning of the Central Business District, a part of the City where all BRT lines will converge and where physical changes will be required to achieve efficient operation. The City's recent Downtown Living Plan should be amended to incorporate these changes. And since the Division bears responsibility to coordinate an urban design agenda for all public and private projects for the City, it should play an essential role in developing a representative brand for a Newark BRT.

The tools that Division can use to guide growth are zoning ordinances, overlay districts and where advisable, redevelopment statutes (such as the recently adopted Broad Street Station Redevelopment Plan), each requiring regulatory approval by the Central Planning Board and Board of Zoning Adjustments. These modifications are informed by the long range planning goals described in the City's Master Plan. The Master Plan is scheduled for re-examination and BRT should be a major part of the Circulation element.

The Department of Engineering will coordinate with City Planning and Community Development and NJ TRANSIT in the comprehensive planning, programming, and design of a BRT system. The Department will play an important role in how BRT shares road space with other vehicles and pedestrians. They will coordinate with NJ TRANSIT the improvement of traffic signals to allow signal pre-emption and any geometric modifications to roadways required by BRT. Into the future, the Department will oversee construction, operation, maintenance, and repair of the permanent public components of the BRT system, including stations and exclusive lanes. It is likely that the specific design of these facilities will be contracted to private design firms. The Engineering Department, in coordination with all other entities involved in the BRT development process, will play a critical role in conveying and advancing the City's BRT branding initiative to these firms and promoting cost effectiveness and design excellence.

The excellent design of Newark Light Rail stations, which include public art, can be models for BRT stations

Ultimately the role of both entities is to inform Newark's Mayor and Council of BRT's potential in order to gain City-wide endorsement and to make the case to higher level authorities for BRT funding.

north jersey planning transportation planning authority

The North Jersey Transportation Planning Authority (NJTPA) is a form of regional government (officially a Metropolitan Planning Organization) that oversees more than $2 billion annually in transportation improvement for the 13-county northern New Jersey region that includes Newark. Located in Newark, the NJTPA is the federally authorized clearing house for federal transportation funding for capital projects and their planning. It also sponsors studies, assists county planning agencies and monitors compliance with national air quality goals. Newark's Mayor is a member of the 15 person Board of Trustees and sits on the Planning and Economic Development Committee.

The NJTPA can play a critical role in both funding planning studies and seeking federal support for capital projects

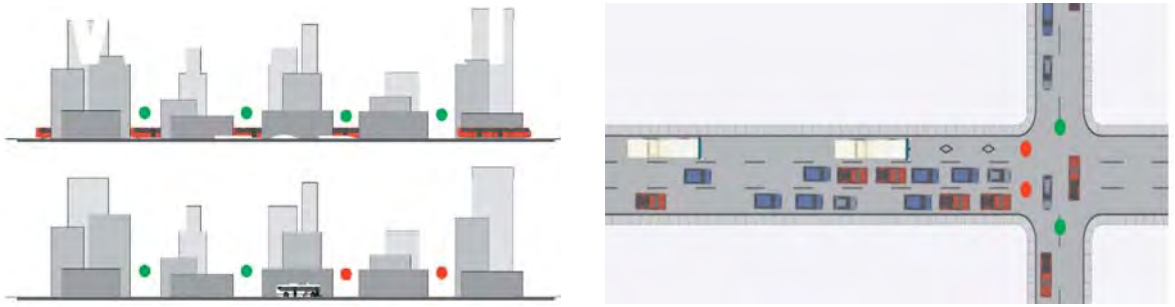
While it is the City of Newark's responsibility to make the case for transportation improvements to the NJTPA, the authority is highly receptive to transit improvements for the City, recognizing the catalytic importance of the City to the region. The special relationship can and should be used to Newark's advantage. For the distribution of federal transportation planning funds, the NJTPA is also organized according to 15 "subregions." Essex County and the City of Newark are both subregions. For the 2008-2009 fiscal year City of Newark was granted $225,000 to study Right of Way Management, Assessment and Priority Systems for the City. Our study recommends that as much as it can, this study incorporate BRT into its scope, especially where it pertains to signal priority and the ability of BRT vehicles to operate efficiently in the City.

IMPLEMENTATION

essex county

Since most of the proposed BRT corridors in Newark are county roads, it is essential that Essex County be included in the planning process. Essex County is responsible for traffic signals whose control is an important feature in BRT performance. Moreover, this feature will require a comprehensive traffic analysis that should examine the larger region that surrounds the City.

Essex County is also a NJTPA subregion and its County Executive sits on its Board of Trustees. The county's support and endorsement will enhance Newark's ability to receive funds from the NJTPA and the federal government. Given that each proposed BRT line extends beyond the City limit, the County's endorsement will encourage those communities to support BRT and become involved in the branding process.



To computer coordinate signals will require coordination with Essex County

state of new jersey

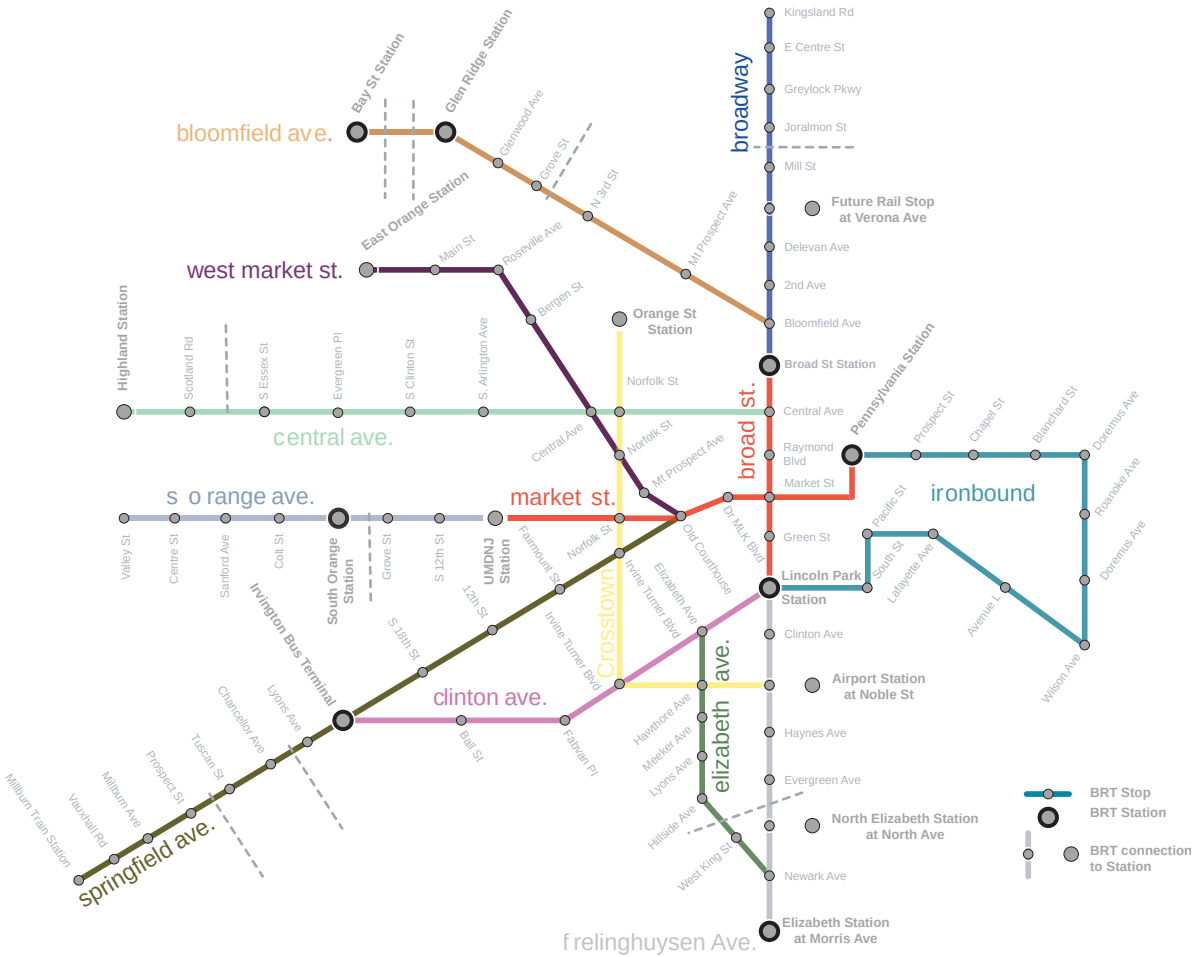
For BRT to receive comprehensive funding it would have to be included in the Statewide Capital Investment Strategy (SCIS) administered by the New Jersey Department of Transportation (NJDOT). The goal of the SCIS is to develop an annual spending level that can achieve the performance objectives of the NJDOT, NJ TRANSIT and the regional transportation planning entities. The SCIS provides strategic direction for a 10-year period. It is important that the City of Newark and NJ TRANSIT collaborate closely in advocating that BRT be included in this strategy.

New Jersey New Jersey Public Law 1999, c.348 (A-3540) sets a 22,400 pound limit per axle on large vehicles. This measure was originally directed at the trucking industry, but applies to buses as well. No other state has this restriction. Unfortunately, this prohibits a low-floor bus of sufficient capacity to operate on New Jersey roads. Low-floor buses purchased for Rutgers University and the Bloomfield Go Bus required operators to petition for an exemption. This report recommends that the legislature amend this law to exclude buses (An amendment raising the axle weight restrictions for buses is working its way through the New Jersey Legislature as of this writing).

federal government

If Newark elects to adopt a comprehensive BRT system, it will have to engage the federal government for funding and the protracted process described in this section under NJ TRANSIT will be triggered. The primary vehicle for this funding will be through the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), which governs all surface transportation spending up through 2009. Congress will begin working on the replacement bill for the next six-year period during its 2009 session. The previous 2005 bill, which allocated $286.4 billion towards specific provisions and earmarks, introduced the New Starts program. The previous bill also included a program know as Small Starts to cover capital costs associated with new fixed guideway systems, extensions, and bus corridor improvements up to $75 million that also feature a streamlined criteria and approval process. A Small Starts application could cover a downtown corridor component of the project. Additional funding could be provided by other federal agencies such as Housing and Urban Development, although the amount would be limited.

Within the Obama administration, new opportunities appear to be emerging in the federal arena, such as the Livable Communities program being formulated by a joint DOT/HUD task force for federal investments in City-oriented projects. Those described in this report are likely to qualify. The City should pay careful attention to these developments and take all necessary steps to participate in the task force's deliberations and to make sure federal policy-makers are fully aware of Newark's transit aspirations.



conclusion

A well designed BRT will be the product of coordination between communities, agencies and governments, with the primary momentum generated in communities at the neighborhood level. This will best assure that Newark's BRT can be a great system with loyal ridership, and one that will bring economic development to the City. There is much work to be done and many discussions yet to occur. Neighborhoods must rally to locate service and then support it. The City must decide where to situate BRT among its various transit projects and funding priorities. Given a directive from the City, the NJTPA could continue the momentum of this study with a comprehensive planning effort supported with up to $500,000 of subregional funding. This undertaking will best inform all stakeholders about how BRT can serve Newark in the future.

FUNDING SOURCES

The chart below itemizes the funding sources available to the City of Newark to implement BRT.

NEW JERSEY FUNDING SOURCES

Program Name	Description	Site Application	Local Coordinating Agency
County Aid Program	County Aid funds are appropriated by the state legislature annually for the improvement of public roads and bridges under county jurisdiction. Public transportation and other transportation projects are also included.	County Roads in any site	NJDOT
Discretionary Aid Fund	These projects are approved at the discretion of the Commissioner. A county or municipality may apply for funding for pedestrian safety and bikeway projects.	Pedestrian and bikeway projects at all sites	NJDOT
Smart Growth Redevelopment Grants	Funding can be used for land assemblage, demolition, removal of materials and debris, and engineering costs. Eligible projects include commercial, industrial, office, and mixed-use projects in urban and developed suburban communities. Projects must hAve municipal support and be part of a local development plan.	All sites	NJ EDA
Green Acres	provides 2% interest loans and grants to municipal and county governments to develop a system of interconnected open spaces	Open Space at all sites	NJDEP
Casino Reinvestment Development Authority Funding	Provides captial investment funds meant to encourage business development and permanent job creation, promotes opportunities for business expansion, and commits to facilitating a vibrant economic investment and employment environment for New Jersey.	Economic Development at all sites	CRDA
Environmental Infrastructure Program	To encourage development in urban areas this program offers a 1.05% interest loans for qualifying Smart Growth projects. Loans can be applied to wastewater and/or stormwater infrastructure projects to serve increased populations in designated Transit Villages.	Environmental Infrastructure at all sites	NJEIT
Municipal Pooled Financing Program	Bonds, which are subsidies at low market rates that are repayable over a long period of time are used to build or purchase capital projects like roads, sewers, water, parking structures	All sites	NJDOT & CCIA
Municipal Aid Program	Road improvement projects such as resurfacing, rehabilitation or reconstruction and signalization are funded	Road improvements at all sites	NJDOT

FEDERAL FUNDING SOURCES		Site Application	Local Coordinating Agency
Transportation Community Development Initiative	Intends to reverse trends of disinvestment and decline in many of the region's core cities and first generation suburbs by supporting local projects, improving overall character and enhancing and utilizing the existing transportation infrastructure capacity	Enhancing transportation infrastructure capacity at all sites	DVRPC
Local Scoping and Local Lead Projects	The Local Scoping program provides federal funds to subregions to advance proposed projects through preliminary engineering and federal environmental reviews. The Local Lead program provides funding to advance projects through final design, right-of-way and construction.	Local projects at all sites	DVRPC
New Markets Loans for Development and Communities	New Markets loans provide low-cost financing for commercial, industrial and mixed-use projects in New Jersey's economically distressed areas in the form of a 3% fixed interest rate loan, which is interest-only for at least seven years. Eligible uses include fixed assets, real estate acquisitions and equipment purchases, and also may include working capital. Loans are available for developers, businesses and nonprofit organizations and projects must be located in an eligible census tract and in a Smart Growth planning area.	Loans for all sites	NJ EDA
Transit Village Funding	Upon designation as a Transit Viillage, municipalities are eligible for the benefit of a grant from NJDOT's annual $1 million Transit Village funding	Transit Village designation at all sites	NJ DOT
Revenue Allocation Bond	The EDA may issue long-term, low-cost bonds on behalf of municipalities seeking to fund infrastructure improvements and other new development costs. The bonds are backed by PILOTs negotiated between the developer and municipality and pledged by the municipality as security for the bonds. "	Infrastructure and development costs at all sites	NJ EDA
Urban Enterprise Zone	The UEZ program offers participating businesses incentives that encourage business growth and stimulate local economies. Some of the benefits include the following: participating businesses can charge half the standard sales tax rates on certain purchases, may qualify for sales tax exemption for their energy and utility consumption, may receive a tax credit for full-time employees, and may receive subsidized unemployment insurance costs, among other benefits."	Business incentives at all sites	NJ Commerce Commission
Revenue Allocation District (RAD)	Encourage private development by using the incremental tax or other revenue generated by a development project to finance various related infrastructure and redevelopment costs. RAD financings are New Jersey's version of tax increment financings, commonly referred to as TIFs. TIF financings involve the incurrence of debt which generally is repaid from the incremental property tax revenue generated by the financed project.	All sites	NJ Economic Development Authority
CHOICE	CHOICE is the Agency's comprehensive financing program for the development of newly constructed and substantially rehabilitated homeownership housing in New Jersey. The program features below-market interest rate construction loans and construction subsidy funding for developers as well as favorable end loan financing for eligible homebuyers	New Housing or rehabilitation at any site, financing for homebuyers	NJ HMFA
Low Income Housing Tax Credits	The credit, a dollar for dollar reduction in federal tax liability, acts as a catalyst to attract private investment into the historically underserved affordable housing market. The additional capital mitigates the debt burden incurred in the construction and rehabilitation development process. Consequently, less rental income is necessary for operations.	New Rental Housing on any site	NJ HMFA
Green Homes Office Resources	Provides a variety green building incentive programs across several state agencies.	New Homes, Industrial, commercial, government, schools	NJ HMFA

FUNDING SOURCES

FEDERAL FUNDING SOURCES		Site Application	Local Coordinating Agency
National Recreational Trails Fund	This can be applied to the creation and maintenance of trails and/or pedestrian projects. This money is generated by the sales and taxes from off-road vehicles such as all terrain vehicles, off-road motorbikes, and snowmobiles. The program is administered by the state	Trails and pedestrian projects at all sites	FHWA
Federal Community Development Block Grant Program	This is used for pedestrian improvements in municipalities where they benefit areas as classified by the Department of Housing and Urban Development as low or moderate income areas or special needs groups, including the disabled.	All sites	HUD
National Highway System	Provides funding for improvements to rural and urban roads that are part of the NHS, including the Interstate System and designated connections to major intermodal terminals.	Orange Street (?)	FHWA
Surface Transportation Program	Provides flexible funding that may be used by states and localities for projects on any Federal-aid highway, including bridge projects on any public road, transit capital projects, and intracity and intercity bus terminals and facilities. Funding may be used for projects relating to intersections with heavy congestion and those projects related to environmental restoration and pollution abatement.	All sites	FHWA
Transportation Enhancement Activities	This can be applied to pedestrian and bicycle infrastructure and facilities, scenic and historic highway programs, landscaping and scenic beautification, historic preservation, and environmental mitigation. In NJ, TE funds may only be used only for projects with direct transportation relationship that enhance quality of life while reaching the greatest number of people.	pedestrian and bicycle infrastructure at all sites	FHWA
CMAQ	Funds may be used for projects aimed at reducing particulate emissions, and public education and outreach activities. The funds are intended primarily for new facilities, equipment, and services aimed at generating new sources of emission reductions.	All sites	FHWA/FTA
Small Starts	Provides capital funds for major transit investment projects. These projects are low cost projects that qualify for a highly simplified project evaluation and rating process by FTA.1. For fixed guideway for at least 50% of the project length in the peak period AND/OR a corridor-based bus project	All sites	FTA

LOCAL PROGRAMS AND FUNDING SOURCES			
Tax abatements	New Jersey law authorizes municipalities, under the state constitution, to provide property tax abatements for residential, commercial and industrial properties in areas in need of redevelopment.	New Housing, Commercial, Industrial Properties and improvements	Local Ordinance
Permit fee reductions/waivers	Building and Housing Fees for eligible charitable and non-profit organizations and disabled persons	Promote Affordable Housing	Local Ordinance
Urban Transit Hub Credit Bill	Businesses to claim a credit for 100% of the cost of a capital investment to property that is located in an urban transit hub defined as within ½ mile of a rail station. This tax credit reimburses companies for eligible expenses. The capital investment must be a minimum of $75,000,000 and if made by a tenant that tenant must occupy space that accounts for at least $25 million of the total investment. The investment only qualifies if it generates no fewer than 250 full-time employees all of whom must earn at least 1.5 times the state minimum wage	All sites	City of Newark

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GLOSSARY

Alighting: When a passenger exits a vehicle.

Articulated Bus: A bus composed of two vehicle sections connected by an articulated joint. An articulated bus has a higher passenger capacity than a standard bus.

Automated Passenger Counter (APC): Technology that counts passengers automatically when they board and alight vehicles. APC technologies include treadle mats (registers passengers when they step on a mat) and infrared beams (registers passengers when they pass through the beam). APC is used to reduce the costs of data collection and to improve data accuracy.

Automated Vehicle Location (AVL): Technology used to monitor bus locations on the street network in real-time. AVL is used to improve bus dispatch and operation, and allow for quicker response time to service disruptions and emergencies.

Barrier Enforced Fare Payment System: A fare collection system (process) where passengers pay fares in order to pass through turnstiles or gates prior to boarding the vehicle. This is done to reduce vehicle dwell times.

Barrier-Free Proof-of-Payment (POP) System: A fare collection system (process) where passengers purchase fare media before boarding the vehicle, and are required to carry proof of valid fare payment while on-board the vehicle. Roving vehicle inspectors verify that passengers hAve paid their fare. This is done to reduce vehicle dwell times.

Boarding: When a passenger enters a vehicle.

Branding: The use of strategies to differentiate a particular product from other products, in order to strengthen its identity. In the context of BRT systems, branding often involves the introduction of elements to improve performance and differentiate BRT systems such as the use of vehicles with a different appearance from standard bus services, distinct station architecture and the use of distinct visual markers such as color schemes and logos.

Brand Identity: Represents how a particular product is viewed among the set of other product options available. In the context of BRT systems, brand identity is necessary so that passengers distinguish BRT services from other transit services.

Bus Rapid Transit (BRT): A flexible, rubber-tired form of rapid transit that combines stations, vehicles, running way, and ITS elements into an integrated system with a strong identity. BRT applications are designed to be appropriate to the market they serve and their physical surroundings. BRT can be implemented in a variety of environments, ranging from rights of way totally dedicated to transit (surface, elevated, or underground) to mixed traffic rights of way on streets and highways.

Bus Street: Street that is dedicated to bus use only.

Capacity: The maximum number of passengers that could be served by a BRT system.

Capacity, Person: The maximum number of passengers that can be carried along the critical section of the BRT route during a given period of time, under specified operating conditions, without unreasonable delay, hazard, or restriction and with reasonable certainty.

Capacity, of Facilities: The number of vehicles per period of time that use a specific facility (i.e., running way or station).

Capacity, of Vehicle: The maximum number of seated and standing passengers that a vehicle can safely and comfortably accommodate. This is determined by the vehicle configuration.

Contextual Design: How well a BRT system demonstrates a premium, quality design and is integrated with the surrounding communities.

Demand: The actual number of passengers attracted to use a BRT system.

Designated Lane: A lane reserved for the exclusive use of BRT or transit vehicles. Dedicated lanes can be located in different positions relative to the arterial street and are classified accordingly:

Concurrent Flow Curb: Next to the curb, used by buses to trAvel in the same direction as the adjacent lane.

Concurrent Flow Interior: Between curb parking and the adjacent trAvel lane, used by transit vehicles to trAvel in the same direction as the adjacent trAvel lane. This is done in situations where curb parking is to be retained.

Contraflow Curb: Located next to the curb, used by transit vehicles to trAvel in the opposite direction of the normal traffic flow. Could be used on one-way streets, or for a single block on two-way streets to enable buses to reverse direction.

Median: Within the center of a two-way street.

Dual-Mode Propulsion: A propulsion system that offers the capability to operate with two different modes, usually as a thermal (internal combustion) engine and in electric (e.g., trolley) mode.

Dwell Time: The time associated with a vehicle being stopped at a curb or station for the boarding and alighting of passengers. BRT systems often intend to reduce dwell times to the extent possible, through such strategies as platform height, platform layout, vehicle configuration, passenger circulation enhancements, and the fare collection process.

Dwell Time Reliability: Ability to maintain consistent dwell times at stations. BRT systems often intend to improve dwell time reliabilities to the extent possible, through such strategies as platform height, platform layout, vehicle configuration, passenger circulation enhancements, and the fare collection process.

Driver Assist and Automation Technology: Form of technology that provides automated controls for BRT vehicles. Examples include collision warning, precision docking, and vehicle guidance systems.

Fare Structure: Establishes the ways that fares are assessed and paid. The two basic types of fare structures are flat fares (same fare regardless of distance or quality of service) and differentiated fares (fare depends on length of trip, time of day, and/or type of service).

Fare Transaction Media: Type of media used for fare payment. Examples include cash (coins and bills), tokens, paper media (tickets, transfers, flash passes), magnetic stripe media, and smart cards. Electronic fare transaction media (i.e., magnetic stripe media or smart cards) can reduce dwell times and fare collection costs, increase customer convenience, and improve data collection.

Global Positioning System (GPS): The use of satellites and transponders to locate objects on the earth's surface. GPS is a widely used technology for AVL systems.

High Occupancy Vehicle (HOV) Lane: A street or highway lane designated for use by vehicles with more than one passenger only, including buses. HOV lanes are often used on freeways.

Hybrid-Electric Drive: A propulsion system using both an internal combustion engine and electric drives that incorporates an on-board energy storage device.

Intelligent Transportation Systems (ITS): Advanced transportation technologies that are usually applied to improve transportation system capacity or to provide trAvelers with improved trAvel information. Examples of ITS applications with relevance to BRT systems include vehicle prioritization, driver assist and automation technology, operations management technology, passenger information, safety and security technology, and support technologies.

Internal Combustion Engine (Thermal Engine): An engine that operates by burning its fuel inside the engine. Combustion engines use the pressure created by the expansion of the gases to provide energy for the vehicle. ICEs typically use fuels such as diesel or natural gas (in either compressed gas or liquefied form).

Level Boarding: An interface between station platform and vehicle that minimizes the horizontal and vertical gap between the platform edge and the vehicle door area, which speeds up passenger boarding/alighting times and does not require the use of wheelchair lifts or ramps. Level boarding is often done through the use of station platforms and low-floor vehicles.

Low-Floor Vehicle: A vehicle designed with a lower floor (approximately 14 inches from pAvement), without stairs or a wheelchair lift. Use of low-floor vehicles could be done in combination with station platforms to enable level boarding, or could be done stand-alone such that passengers are required to take one step up or use a wheelchair ramp to board the vehicle.

Multiple-Door Boarding: Passengers are allowed to board the vehicle at more than one door, which speeds up boarding times. This typically requires off-board fare collection.

Operations Management Technology: Automation methods that enhance the management of BRT fleets to improve operating efficiencies, support service reliability, and/or reduce trAvel times. Examples include automated scheduling dispatch, vehicle mechanical monitoring and maintenance, and vehicle tracking systems.

Passing Capability: The ability for vehicles in service to pass one another. Bus pullouts and passing lanes at stations are two primary ways to enhance passing capability for a BRT system.

Passenger Circulation Enhancement: Features that govern passenger accessibility to vehicles and circulation within vehicles. Examples include alternative seat layouts, additional door channels, and enhanced wheelchair securements.

Passenger Information System: Technologies that provide information to trAvelers to improve customer satisfaction. The most common application relevant to BRT systems is the real-time provision of information pertaining to schedules, wait times, and delays to passengers at stations or on-board vehicles using variable message signs and an automated vehicle location technology.

Pay On-Board System: A fare collection system (process) Passengers pay fares onboard the vehicle at the farebox, or display valid fare media to the bus operator.

Platform: A station area used for passenger boarding and alighting. A side platform is adjacent to the curb or a running way. A center platform is located between the vehicle running way and the center of the running way, or median; this is less common

Platform Height: Height of the platform relative to the running way. The three basic options for platform height are the standard curb, the raised curb, and the level platform.

Platform Layout: Design of the platform with respect to vehicle accommodation. The three basic options for platform layout are the single vehicle length platform, the extended (i.e., multiple vehicle) platform with un-assigned berths, and the extended platform with assigned berths.

Precision Docking System: A guidance system used to accurately steer vehicles into alignment with station platforms or curbs. These may be magnetic or optical-based, and require the installation of markings on the pAvement (paint or magnets), vehicle-based sensors to read the markings, and linkages with the vehicle steering system.

Propulsion System, Vehicle Propulsion System: The means of delivering power to enable vehicle movement. The most common propulsion systems for BRT vehicles include internal combustion engines fueled by diesel or compressed natural gas, electric drives powered by the use of an overhead catenary, and hybrid-electric drives with an on-board energy storage device. The choice of propulsion system affects vehicle capital costs, vehicle operating and maintenance costs, vehicle performance, ride quality, and environmental impacts.

Queue Jumper: A designated lane segment or traffic signal treatment at signalized locations or other locations where traffic backs up. Transit vehicles use this lane segment to bypass traffic queues (i.e., traffic backups). A queue jumper may or may not be shared with turning traffic.

Route Length: The length of the route affects what locations the route serves and the resources required to operate that route.

Route Structure: How stations and running ways are used to accommodate different vehicles that could potentially be serving different routes.

Running Time: Time that vehicles spend moving from station to station along the running way. BRT systems are designed to reduce running times to the extent possible, through such strategies as running way segregation, passing capability, station spacing, ITS, and schedule control.

Running Time Reliability: Ability to maintain consistent running times along a route. BRT systems are designed to improve running time reliabilities to the extent possible, through such strategies as running way segregation, passing capability, station spacing, ITS, and schedule control.

Running Way: The space within which the vehicle operates. For BRT systems, the running way could be a fully grade-separated exclusive transitway, an at-grade transitway, a designated arterial lane, or a mixed flow lane. BRT vehicles need not operate in a single type of running way for the entire route length.

Running Way Marking: The visible differentiation of the running ways used by BRT vehicles from other running ways. Signage and striping, raised lane delineators, and alternate pAvement color/texture represent three major techniques.

Running Way Segregation: Level of segregation, or separation, of BRT vehicles from general traffic. A fully grade-separated exclusive transitway for BRT vehicles represents the highest level of segregation, followed by an at-grade transitway (second highest); a designated arterial lane (third highest); and a mixed flow lane (lowest).

Safety and Security Technology: Systems that enhance the safety and security of transit operations. Examples include silent alarms on the vehicle that can be activated by the driver, and voice and/or video surveillance monitoring systems in stations or on-board vehicles.

Schedule Control: How vehicle on-time performance is monitored, either to meet specified schedules or to regulate headways. Headway-based control is more common for very high frequency routes.

Service Frequency: The interval of time between in-service vehicles on a particular route. Determines how long passengers must wait at stations, and the number of vehicles required to serve a particular route. Service frequencies for BRT systems are typically high relative to standard bus services.

Service Reliability: Qualitative characteristics related to the ability of a transit operation to provide service that is consistent with its plans and policies and the expectations of its customers.

Service Span: The period of time that a service is available to passengers. Examples include all day service and peak hour only service.

GLOSSARY

Signal Timing/Phasing: Involves changes to the normal traffic signal phasing and sequencing cycles in order to provide a clear path for oncoming buses.

Station: Location where passengers board and alight the vehicle. The BRT stations can range from simple stops or enhanced stops to, designated station and the intermodal terminal or transit center. A station often has more passenger amenities than a stop (i.e., benches, shelters, landscaping, trAveler information).

Station Access: Means of linking stations with adjacent communities in order to draw passengers from their market area. Examples include pedestrian linkages (i.e., sidewalks, overpasses, pedestrian paths) and park-and-ride facilities.

Station and Lane Access Control: Allows vehicle access to dedicated BRT running ways and stations with variable message signs and/or gate control systems.

Station Spacing: The spacing between stations impacts passenger trAvel times and the number of locations served along the route. Station spacings for BRT systems are typically farther apart relative to standard bus services.

Support Technologies: Technologies used to support ITS applications. Examples include advanced communication systems, archived data, and automated passenger counters.

Ticket Vending Machine (TVM): A fixed machine that accepts a combination of cash, stored value media, and credit cards to dispense valid tickets and other fare media

Transfer Time: The time associated with a passenger waiting to transfer between particular transit vehicles. The network design determines where passengers need to make transfers. Service frequency and reliability are the primary determinants of transfer time.

Transit Signal Priority: Adjustments in signal timing to minimize delays to buses. Passive priority techniques involve changes to existing signal operations. Active priority techniques involve adjustments of signal timing after a bus is detected (i.e., changing a red light to a green light or extending the green time).

Transitway/Busway: Traffic lane dedicated to exclusive use of transit vehicles that is physically separated from other traffic lanes. May or may not be grade separated.

Validator: A device that reads a fare instrument (fare transaction medium) to verify if a fare paid is valid for the trip being taken by the passenger

Variable Message Sign (VMS): A sign that provides flashing messages to its readers. The message posted on the sign is variable and can be changed in real-time.

Vehicle Configuration: The combination of length (standard, articulated, or specialized), body type (conventional, stylized, or specialized), and floor height (standard or low-floor) of the vehicle. In practice, BRT systems can use any combination of different vehicle configurations on a single running way.

Vehicle Guidance System: A guidance system used to steer vehicles on running ways while maintaining speed. These may be magnetic, optical, or GPS based, and require the installation of markings on the pAvement (paint or magnets), vehicle-based sensors to read the markings, and linkages with the vehicle steering system. Guidance can be lateral (side-to-side to keep buses within a specified right-of-way) or longitudinal (to minimize the following distance between vehicles).

Vehicle Prioritization: Methods to provide trAvel preference or priority to BRT services.
Examples include signal timing/phasing, station and lane access control, and transit signal priority.

Wait Time: The time associated with a passenger waiting at a station before boarding a particular transit service. Service frequency and reliability are the primary determinants of wait time.

A B7RLE in Singapore – Wikipedia “Volvo B7RLE”http://en.wikipedia.org/wiki/Volvo_B7RLE , Sep. 12, 2007

Abuelsamid, Sam. (March 22nd, 2007). Volvo Shows off Hybrid Bus Technology in Brussels. Autobloggreen http://www.autobloggreen.com/2007/03/22/volvo-shows-off-hybrid-bus-technology- in-brussels, Sep.12, 2007

“Bus Rapid Transit is Becoming a Popular Option for Communities Seeking High-Capacity Transit Service.” www.parametrix.com Parametrix.

“Bus Rapid Transit Concept.” Sustainable Mobility Solutions “2 get there” http:// www.2getthere.eu/media/pictures/medium/phileas4, Sep.12, 2007

“Bus Rapid Transit Planning Guide.”www.nbrti.org June 2007. National BRT Institute. 16 Sept. 2007

BRT Concept Vehicle .BRT Policy Center – Transportation Choices for the 21st Century “What is BRT?” BRT Policy Center www.gobrt.org , Sep. 12, 2007

BRT Phileas Bus, Sep.12, 2007 Barrier free access to the Phileas vehicle, France Advanced Public Transport

“Designing Tomorrow’s Building Infrastructure Today.” Onshore.Com.Onshore.www.onshore.com/about_us/news/ala_infrastructure 16 Sept. 2007

Futuristic Phileas Vehicle, France Advanced Public Transport “Phileas; BRT in Eindhoven and Douai” http://connectedcities.eu,

Heller, Jean. St. Petersburg Times “Bus rapid transit set for debut in bay area”http://www.sptimes.com Sep. 12, 2007

“Los Angeles “Orange Line” Busway” Light Rail Now Production Team http://www.lightrailnow.org October 2006, Sep.12, 2007

Mair, Ross. Light Rail Now !Light Rail Progress Production Team “A Bus by Any Other Name Is Still ... a Train?” www.lightrailnow.org ,Sep.12, 2007

One of FirstGroup’s B7RLE seen in Manchester – Wikipedia “Volvo B7RLE” http://en.wikipedia.org/wiki/Volvo_B7RLE , Sep. 12, 2007

“Phileas; BRT in Eindhoven and Douai” http://connectedcities.eu BRT Phileas Bus Sep.12, 2007

Proposed BRT system operating in Eugene, Oregon. BRT Policy Center – Transportation Choices for the 21st Century “What is BRT? www.gobrt.org BRT Policy Center ,Sep. 12, 2007

Pump and Motor Combinations for hydrostatic Drives. Construction. Integrated Publishing. http://www.tpub.com/content/construction/14273/css/14273_221.htm Sep.12, 2007

RTC. Max: The vehicle http://www.rtcsouthernnevada.com/max/thevehicle.htm Regional Transportation Commission of Southern Nevada ,Sep. 12, 2007

TCRP report 118. Bus Rapid Transit Practitioner’s Guide. Transit Cooperative Research Program. Transportation Research Board of the National Academies.

TCRP report 90. Bus Rapid Transit. Volume 2:Implementation Guidelines. Transit Cooperative Research Program. Transportation Research Board of the National Academies

U.S. Department of Transportation - Federal Transit Administration. www.fta.dot.gov/assistance/technology/research, 15 Sept. 2007

What are Green Diesel Technology Vehicles? Clean Air News. Green Diesel Technology Vehicles. http://www.greendieseltechnology.com/whatis.asp, Sep.12, 2007

REFERENCES

Wikipedia “Temsa Diamond” http://en.wikipedia.org/wiki/TEMSA Martin Hawlisch, Sep 12, 2007

Wikipedia “Temsa Safari IC” http://en.wikipedia.org/wiki/Image:Postbus_Temsa.jpg Tobias B Köhler ,Sep. 12, 2007

Wright, Lloyd and Hook, Walter. Institute for Transportation and Development Policy. BRT Planning Guide. (September 2007)

stations and roadways

“Bus Lanes.” http://www.fta.dot.gov. U.S. Department of Transportation - Federal Transit Administration. http://www.fta.dot.gov/assistance/technology/research Sep.15, 2007

“Busways.” http://www.fta.dot.gov. U.S. Department of Transportation - Federal Transit Administration. http://www.fta.dot.gov/assistance/technology/research Sep.15, 2007

“North American BRT Forum.” http://www.missiongrouponline.com. The Mission Group. http://www.missiongrouponline.com ,Sep.15, 2007

“Special Feature on Kerb Guided Buses.” http://www.garden.force9.co.uk Citytransport.Info. Sep.15, 2007 Mann, Eric & Bus Riders Union Planning Committee,” A New Vision for Urban Transportation”, Strategy Center Publications, L.A. 1996, www.busridersunion.org, September 21, 2007

transit racism

Fighting Transit Racismhttp://gristmill.grist.org, September 21, 2007

MTA PRESS RELATIONS August 22, 2000 , http://www.mta.net/news_info/archives/2000/08_August/mta096.htm

Tennyson, Edson L.,P.E. – December 2002, LA’s Metro Rapid “BRT” – Just 13% From Automobiles?’ Commentary
http://www.lightrailnow.org ,September 21, 2007

bus rapid transit

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