

Appendix B – Bus Rapid Transit Preliminary Conceptual Development Scenario

This appendix presents a preliminary conceptual look at what a Bus Rapid Transit (BRT) system for the region might look like and cost, but further transit planning by the City of Albuquerque, the Rio Metro Regional Transit District and MRMPO will be necessary to develop an implementable high capacity transit network. This appendix is included as part of the 2035 MTP to help begin discussion among all stakeholders about what such a system could look like and what is possible in terms of transit in our region.

An important step in promoting public transit enhancements is visualizing what the service might look like. Both the 2035 MTP survey and feedback from MRMPO's public meetings indicated an appetite on the part of the public for expanded transit service and a willingness to prioritize transit over other options for improving mobility. This public support is greatly assisted by the Metropolitan Transportation Board's dedication of at least 25 percent of discretionary funds from the Transportation Improvement Program (TIP) towards transit services that mitigate river crossing congestion.

The shape that this transit service might take is open to discussion. Recently the Rio Metro Regional Transit District and MRMPO began exploring the feasibility of a Bus Rapid Transit (BRT) network. This appendix section offers a concept of potential BRT services that provide alternative means of crossing the Rio Grande while providing connections to the New Mexico Rail Runner Express and connecting major residential and employment centers. The *BRT scenario* described herein is a set of complete investments in new transit routes funded solely by money made available from the federal TIP program. The purpose of this conceptual financial scenario is to show what could be accomplished using a consistent approach over the next twenty years. By considering federal discretionary funds as the sole source of capital and infrastructure investments for the BRT network, an intentionally conservative estimate is provided that excludes any additional local investment or private partnerships. This scenario therefore represents one component of what could be a much larger, longer-term strategy.

It is important to note that this network is conceptual and was developed for the purpose of preliminarily estimating what potential costs would be and what could be implemented using a single source of funds (federal). In addition, it does not represent any commitments on the part of MRMPO or any member agencies.

What is Bus Rapid Transit (BRT)?

BRT is a high speed, generally high frequency form of transit that is designed to move large numbers of travelers and commuters efficiently along major travel corridors. It is generally considered a premium bus service, but is considerably less expensive than other forms of mass transit such as light rail and streetcars. BRT was first implemented in Brazil and Colombia in the 1990s, and service is now widespread in those and other nations (the Transmilenio BRT service in Bogota, Colombia carried more than 1.6 million trips per day in 2009, while service in Brisbane, Australia provides average travel times of 18 minutes versus 60 minutes by car). BRT can now be found in large US cities such as Chicago and Los Angeles, as well as smaller urban areas including Eugene, OR and Albany, NY.

Characteristics of Bus Rapid Transit

- Separated right-of-way, including bus-only lanes or HOV lanes (for buses, vanpools and carpools), or fixed guideways that steer buses along portions of a route
- Frequent, high-capacity service (ideally ten minute or less wait times between buses)
- High-quality vehicles that are easy to board, quiet, clean and comfortable to ride
- Pre-paid fare collection and easy access to the buses through raised platforms to minimize boarding delays
- High quality stations with rider services
- Transit-oriented development in nearby areas
- Integration between modes, with BRT service coordinated with walking and cycling facilities, taxi services, intercity bus, rail transit, and other transportation services

Source: Victoria Transport Policy Institute – “Online TDM Encyclopedia”

BRT-type service already exists in the Albuquerque area in the form of the popular Rapid Ride routes provided by ABQ Ride. One of these routes, the Blue Line or Route 790, already provides a connection from the Westside to downtown Albuquerque and the University of New Mexico main campus via Coors Boulevard and I-40. Rapid Ride routes currently have limited signal prioritization and right of way and operate more as express routes along existing transit corridors. The three Rapid Ride routes stop approximately every mile at major intersections and activity centers and range in frequency from 16 to 20 minutes on weekdays. Two Rapid Ride routes overlap between Louisiana and Downtown along Central Avenue and boast a combined frequency of one bus every eight minutes in the corridor. However, there are features that prevent Rapid Ride routes from operating as quickly and efficiently as possible. For example, on-board fare collection creates long dwell times at each stop, while limited dedicated

infrastructure means that buses are subject to the same delays and traffic conditions as single occupancy vehicles.

BRT Scenario

The conceptual *BRT scenario* includes many elements designed to ensure truly “rapid” service. While a full study is needed to determine the location and nature of BRT-specific infrastructure, incorporating these elements means that BRT would be more expensive than implementing the average transit route, yet the result would be guaranteed travel times and high frequency and quality service.

Scenario assumptions

This scenario makes a series of assumptions that are consistent with the costs and practices of other BRT systems around the United States:

- Average speed assumptions are based on a combination of free flow traffic speeds and reasonable speeds along dedicated transit-only infrastructure
- Off-board fare collection allows for dwell times of 30 seconds or less
- Vehicles operate for 12 years before requiring replacement
- Annual operating costs assume 310 days of service for 16 hours per day with operating expenditures of \$85 per hour. This assumption does not include Sunday service but does allow for Saturday service to operate with the same frequency as weekdays.
- Costs of new BRT vehicle purchases (\$825,000/vehicle) and the construction of park and ride facilities (\$3 million) are based on ABQ Ride expenditures
- Costs per mile of transit infrastructure construction is on average \$2.5 million and includes necessary right of way acquisition, construction of dedicated transit lanes, queue-jump facilities, station area development and signage. Specific infrastructure requires more detailed planning than is given here.
- An average of \$6 million a year will be made available from the federal TIP program for transit projects over the twenty year period from 2016 to 2035, resulting in a total of \$120 million. This number is supplemented by the Rio Metro local funding match, which adds \$17.5 million to the available funds for BRT service.
- All costs are expressed in 2011 dollar values
- Funding is expected to increase at the rate of inflation; in other words funding increases are assumed to equal rising labor and capital costs due to inflation

What is Possible?

The requirement from the Metropolitan Transportation Board to set aside 25 percent of discretionary funds for transit represents a new level of commitment to comprehensive transit improvements than previous Transportation Improvement Programs. While the monetary commitment is important, the recurring nature of the funding means that a true BRT system is feasible and long-term planning can begin. An analysis of the initial costs associated with implementing a high-level BRT system reveals that the infrastructure – including the vehicle purchase and all other capital costs over the twenty-year period – could be covered using the TIP funding allocated for transit for at least three premium BRT lines. Figure B-1 shows these potential routes and corresponding transit facilities. It is important to make clear that the routes indicated here are *potential* routes; the actual routes may vary but the scenario provided here does identify the markets that the City of Albuquerque, MRMPO and Rio Metro are trying to serve.

Conceptual BRT Network Scenario

The *BRT scenario* projects the Northwest Mesa route as the first BRT line to be implemented beginning in 2016, followed by the Southwest route in 2020, and the Rio Rancho line in the year 2025.

1. NW Mesa – Unser Blvd/Paseo del Norte/Jefferson St
2. SW Mesa – Arenal Blvd/Bridge Blvd/Downtown
3. Rio Rancho – US 550/Paseo del Volcan/Unser Blvd

The first route penetrates markets in the rapidly developing northwest portion of Albuquerque and southern Rio Rancho and connects residential communities to the NM Rail Runner Express and the Journal Center employment district. Little existing transit service currently exists in this portion of the AMPA, and due to the nature of development in the area there is relatively little accessibility to transit corridors for pedestrians and bicyclists. This type of built environment requires a large number of park and ride stations along with appropriate bicycle and pedestrian facilities in order to provide access to the transit line. However the magnitude of congestion projected for the Westside and the reliable travel times that BRT can provide make short driving trips to transit facilities an enticing alternative. Well-designed stations also provide meaningful opportunities for transit-oriented development. The NW Mesa route is also expected to mitigate congestion over Paseo del Norte and provide key connections across the Rio Grande.

Map B-1: Potential 2035 Bus Rapid Transit Scenario Network Possible Solely Using Federal Funds

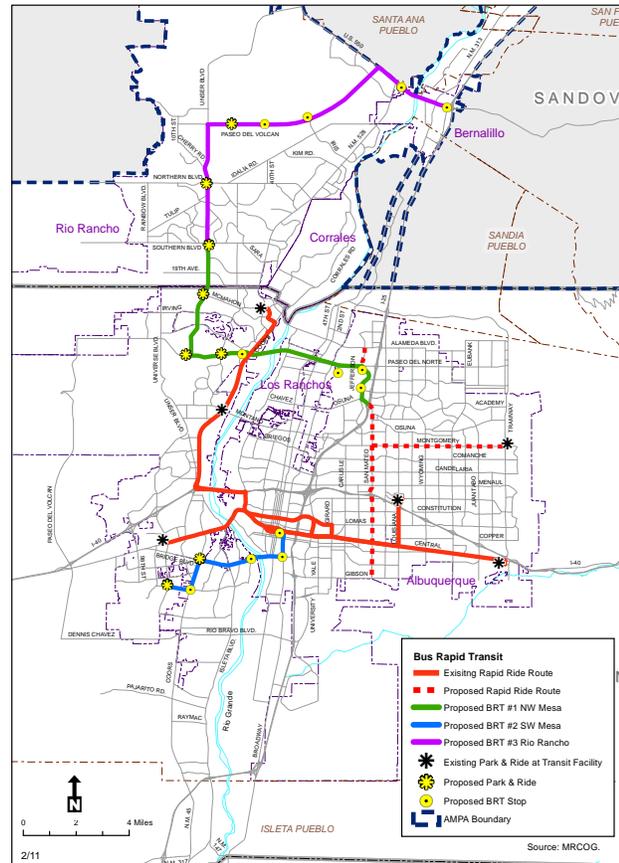


Table B-1: Conceptual Route Characteristics

Route	Length (one way)	Avg Speed	Frequency	Cycle Time	No. of Buses	Stations	Park and Rides
Northwest Mesa	12.5 miles	25 mph	15 mins	80 mins	6	8	4
Southwest Mesa	6.5 miles	20 mph	15 mins	60 mins	4	6	2
Rio Rancho	12.4 miles	30 mph	20 mins	70 mins	4	7	2
Total	31.4 miles				14	21	8

The second route connects portions of unincorporated Bernalillo County and the South Valley to Downtown Albuquerque via Bridge Boulevard, a highly congested corridor and major river crossing facility. This is an important route not only for its potential to mitigate congested roadways but also for providing transit service to key communities with less access to personal vehicles and therefore less mobility.

The third route is part of a long-term vision for the region's transportation future. The Rio Rancho line would connect to the NW Mesa route, provide service north to Rio Rancho city center and connect to areas of northern Rio Rancho currently underserved by transit before joining US 550 and connecting to the Rail Runner station on the east side of the Rio Grande. While demand for connections between Rio Rancho city center and the US 550 station are currently modest, that demand will undoubtedly grow over time as the city center realizes its full development potential. US 550 is also one of the few facilities by which Rio Rancho residents can access the Eastside, and the corridor constitutes a crucial river crossing alternative and provides access across the AMPA.

Rapid Ride Routes

ABQ Ride has proposed a series of additional corridors for new Rapid Ride service, although specific routes and implementation dates and strategies are yet to be finalized. For the purpose of this scenario, two specific routes are considered and shown in Figure B-1. This scenario suggests overlapping routes that combine to provide 15-minute frequencies along San Mateo Boulevard between Gibson Boulevard and Montgomery Boulevard. The result is that by 2035 several key corridors on the Eastside will be served by Rapid Route routes, while four total river crossings will feature BRT or Rapid Ride service.

The two specific routes included in this scenario are:

1. Montgomery/Tramway-San Mateo/Gibson
2. San Mateo-Jefferson – north/south from Gibson along San Mateo, then proceed along Jefferson St from Montgomery to Alameda

These Rapid Ride routes could provide additional service above and beyond the local service already provided, as is the case along Central Avenue. Due to the nature of Rapid Ride service, it could be implemented relatively inexpensively (bus purchases, station/shelter construction, planning and operations). More premium components such as off-vehicle fare payment, queue jumpers and signal prioritization could be added over time as funds become available.

Financial Plan

The investment scheme is necessary as not all funding is available at once, and in the case of the Rio Rancho route, the demand does not yet exist but is likely to develop over time as the City of Rio Rancho continues to grow. Total funding available through the TIP and Rio Metro local match amounts is estimated to be \$137.5 million dollars between 2016 and 2035. The greatest percentage of costs goes to roadway infrastructure (e.g., queue-jump facilities, dedicated transit lanes, transit signal prioritization), which accounts for more than 66 percent of the needed investments; park and ride facilities would require another 20 percent.

The approximately \$117.4 million required to initiate and construct the BRT routes does not include annual operating expenses, which are not an allowable use of TIP funds. However, Rio Metro projects a growing intake from gross receipts tax which could cover the costs of operating the proposed BRT routes, even though annual operating expenses could reach nearly \$6 million once all three routes are fully implemented.

Table B-2: Total Conceptual Route Investments 2016-2035

Route	Start Date	Total Vehicle Costs	Park and Rides	Infrastructure	Total Costs	Annual Operating Costs
Northwest Mesa	2016	\$8,250,000	\$12,000,000	\$31,092,500	\$51,342,500	\$2,529,600
Southwest Mesa	2020	\$4,400,000	\$6,000,000	\$16,135,000	\$26,535,000	\$1,686,400
Rio Rancho	2025	\$2,750,000	\$6,000,000	\$30,780,000	\$39,530,000	\$1,686,400
Total		\$15,400,000	\$24,000,000	\$78,007,500	\$117,407,500	\$5,902,400

Finally, after broadly estimating the costs of BRT implementation under this scenario, there are sufficient funds available to pay for new vehicle purchases for future Rapid Ride vehicles. While discretionary federal funds cannot be used for Rapid Ride operations, the vehicle purchase costs for proposed routes along San Mateo and Montgomery is approximately \$620,000 per year (\$12.4 million over twenty years) and could be covered with spare funds from the TIP set aside. In short, the funding made available for river crossing mitigation through transit is sufficient to cover all infrastructure and capital investments for at least three premium BRT routes and for additional investments to ABQ Ride's Rapid Ride system.

Additional Transit Infrastructure

Transit improvements, such as the BRT service proposed in this scenario, function best when integrated into a multi-modal transportation network. For example, it is important that BRT services on the Westside include bicycle and pedestrian infrastructure to provide opportunities to access transit routes. A number of roadway improvements are slated for construction on the Westside, and ensuring that new and expanded roadways incorporate transit infrastructure is also imperative. Despite the obvious challenges of developing meaningful BRT service to connect the eastern and western portions of the AMPA, there are additional improvements which would complement the proposed BRT service and help create an increasingly integrated regional public transportation network. In particular, changes to the New Mexico Rail Runner Express and ABQ Ride services provide crucial opportunities for expanding accessibility across the entire region.

Rail Runner Service Expansion

Rio Metro is considering the feasibility of increasing the frequency of Rail Runner service in the urbanized area. This service expansion could be accomplished relatively inexpensively as the infrastructure is already in place and additional cars would not be needed, and some additional service could be met with existing staff. The major expenditure would be the added fuel and maintenance costs such service would require. Expanding Rail Runner service in the AMPA beyond peak-period commuter times further improves accessibility and greatly enhances the benefits of BRT by providing a more fully-integrated transit network. Ultimately these improved connections could link the Westside to employment centers across the Rio Grande and enable access to the northern and southern limits of the metropolitan area in Bernalillo, Rio Rancho, Los Lunas and even Santa Fe, all without requiring a vehicle.

Improvements to Existing ABQ Ride Services

ABQ Ride is continually improving the quality of its service by adding new routes and improving the frequency of existing services. While the existing Rapid Ride routes are popular and play an important role in regional mobility and travel demand management, improvements can be made to further improve the efficiency and quality of existing routes. Foremost among the locations for improvements is along Central Avenue, which is already the highest ridership transit corridor in the AMPA with some sections currently featuring transit mode shares of more than 15 percent. There is tremendous potential for transit-specific infrastructure along Central Avenue, from off-vehicle fare payment and level boarding at stations to more widespread transit signal prioritization, queue-jumpers and dedicated lanes.

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