



MEMO

To: MAG Transit Committee
From: Wulf Grote, Director, Planning and Development
Date: October 13, 2010
Re: **TEMPE SOUTH CORRIDOR STUDY**
Alternatives Analysis Recommendations

PURPOSE

This report provides METRO staff recommendations for the Tempe South Alternatives Analysis. Included are recommendations regarding the appropriate transit technologies and alignment. Additional study needs are also identified.

BACKGROUND/DISCUSSION

In August 2007, METRO initiated a federally sponsored Alternatives Analysis in the Tempe South corridor. The study initiates the Federal Transit Administration's (FTA's) project development process in order to qualify for Section 5309 Small Start federal funding. Specific purpose and needs of the project were identified and include:

- Improve mobility of residential and business communities;
- Develop an efficient transportation system;
- Accommodate future travel demand;
- Support local and regional development goals and TOD strategies;
- Develop a transportation system that is affordable to build, operate, and maintain;
- Develop transportation strategies that reinforce the cities general plan; and
- Develop a transportation system that provides connectivity to/from neighborhoods, employment, and recreational opportunities.

The Maricopa Association of Governments (MAG) Regional Transportation Plan (RTP) includes two significant transit projects within the Tempe South study area; a 2-mile high capacity/light rail transit improvement extending south from downtown Tempe and a BRT corridor on Scottsdale/Rural Road extending from north Scottsdale to Chandler. Both transit modes were analyzed as part of this study, but only the BRT segment south from downtown Tempe was evaluated as part of the Tempe South study effort. RPTA/Valley METRO, and the cities of Scottsdale and Tempe have undertaken a separate analysis evaluating BRT options north from downtown Tempe to Frank Lloyd Wright Drive in the City of Scottsdale.

Modern streetcar in the Mill Avenue corridor and BRT on Rural Road serve different travel markets in the Tempe South study area. **Figure 1** illustrates the three travel markets; each with unique characteristics and service needs: 1) Arizona State University (ASU) 2) North Tempe (exclusive of ASU) and 3) South Tempe / Chandler. ASU, for example, is characterized by an all-day trip pattern that originates in multiple areas of the region. North Tempe is focused around downtown Tempe and is characterized as being pedestrian friendly, with greater business and residential densities around the Central Business District (CBD). South Tempe is generally characterized by lower density,

higher income, and an established commute pattern. A shorter modern streetcar project will carry the significant number of trips generated within downtown Tempe as well as those trips currently using local bus service on Mill Avenue. Bus rapid transit is a good solution for those looking to travel longer distances along Rural Road. It is anticipated that both will connect to the regional Central Phoenix / East Valley light rail line; providing greater reach for all trip types.

ALTERNATIVES ANALYSIS PROCESS

A two-tiered alternatives development process was used to evaluate the Tempe South corridor. The first phase (Tier 1) included a mostly qualitative evaluation that analyzed the advantages and disadvantages of a wide range of potential alternatives to address the transportation needs of the corridor. Mode options included BRT, LRT, modern streetcar, and commuter rail. Route options included Rural Road, Mill Avenue, McClintock Drive, Kyrene Road, and the UPRR.

The Tier 2 evaluation was a more rigorous screening process involving five alternatives. This included three BRT options; one adjacent to the UPRR, and the others along Mill Avenue/Kyrene Road and Rural Road; one LRT alternative along Rural Road and a modern streetcar alternative along Mill Avenue. An evaluation matrix presenting the Tier 2 criteria by alternative is included in **Table 1** below.

TABLE 1: Evaluation Matrix of Tier 2 Criteria, Tempe South

| Evaluation Criteria | UPRR BRT | Mill Kyrene BRT | Mill Streetcar | Rural LRT | Rural BRT |
|---|----------|-----------------|----------------|-----------|-----------|
| Rider benefits | + | + | --- | O | O |
| Traffic issues | O | O | O | --- | --- |
| Connectivity to downtown Tempe, ASU and West Chandler | + | + | + | O | + |
| Population served | --- | --- | O | + | O |
| Environmental issues | O | + | + | + | + |
| Urban design elements | O | O | + | + | O |
| General impact to community | O | O | O | --- | O |
| Community support | --- | --- | + | O | O |
| Land use | --- | O | O | + | O |
| Economic development potential | --- | O | + | O | O |
| Design and constructability issues | O | + | O | --- | + |
| Capital costs ⁽¹⁾ | O | + | --- | --- | + |
| Operating costs ⁽¹⁾ | N/A | N/A | O | O | + |

Ratings:

| | | |
|---|---|--|
| + | = | Alternative would have greater benefit (or lesser adverse impact) related to the other alternatives. |
| O | = | Alternative would not produce a significant change from the future no-build conditions or would have a moderate impact relative to the other alternatives. |
| - | = | Alternative would have a lesser benefit (or greater adverse impact) than the other alternatives. |

(1) It is assumed that operating and capital funding to support the Rural Road BRT alternative have been delayed beyond funding availability identified in the RTP.

Three alternatives were eliminated from consideration. Below is a summary, by alternative, that include significant reasons as to why each alternative was eliminated.

- UPRR BRT – This alternative, while achieving reasonable rider benefits suffered from a lack of community support. Additionally, this alternative was a relatively expensive option, largely due to the cost to build pedestrian and commuter access to an isolated rail line. And, finally, the UPRR BRT had the potential to cause conflict with future commuter rail planning efforts.
- Mill / Kyrene BRT – This option was eliminated due to a lack of existing transit customers south of Baseline. It was thought that a major capital investment was premature in a corridor without an existing local transit market.
- Rural Road LRT – This alternative was removed from consideration given the cost and neighborhood impacts of constructing an overpass at the UPRR crossing between Broadway and Apache Blvd. In addition, to maintain the traffic carrying capacity of Rural Road, significant widening would be required causing further impacts to the neighborhoods adjacent to Rural Road.

The Tier 2 evaluation, coupled with extensive public comment, resulted in the advancement of two projects: a 2.6 mile modern streetcar on Mill Avenue; and a 12 mile BRT on Rural Road. Although not evaluated in Tier 2 because it was beyond the study’s scope, commuter rail using the UPRR tracks was also recommended for further study given the amount of support identified for commuter rail through the stakeholder process.

Mill Avenue Modern Streetcar

The modern streetcar project would be located on Mill Avenue between Southern Avenue and downtown Tempe. A map of this project is included in **Figure 2**, with a close-up of the downtown alignment shown in **Figure 3**. Initially, the study also included analysis of a segment on Southern Avenue between Mill Avenue and Rural Road, however due to financial constraints the mile segment to Rural was deferred until additional funding could be pursued. Southern Avenue is important since it provides a link to Tempe community facilities at Rural Road and Southern Avenue; creates an opportunity for a park-and-ride; and provides a direct connection to existing local bus service and future regional BRT service on Rural Road.

Daily ridership estimates for the modern streetcar project are 1,100 – 1,600 in the opening year. This ridership forecast assumes service levels comparable to existing light rail, but does not include special event ridership. It also assumes a reconfigured background bus network optimized to serve the modern streetcar alternative. It is anticipated that changes in future land use and economic development will enhance these ridership figures in the future. For example, daily ridership on the 1.4-mile South Lake Union modern streetcar in Seattle has increased from 900 to nearly 2,500 since opening in 2008, largely due to changes in land use and economic development. **Table 2** illustrates forecasted ridership on the Modern Streetcar line.

TABLE 2: Ridership on the Mill Avenue Modern Streetcar

| | Year 2015 ⁽¹⁾ Forecast Mill Modern Street Car |
|----------------------------|--|
| Daily Ridership Estimates: | |
| Average daily ridership | 1,100-1,600 |
| Riders per mile | 425-615 |

(1) 2015 represents the MAG socio-economic forecasts nearest to Mill Modern Streetcar opening day.

The 2.6-mile Mill Avenue modern streetcar project includes the following benefits:

- Increases transit ridership in the corridor;
- Connects neighborhoods to downtown Tempe;
- Connects residents to neighborhood services;
- Encourages redevelopment of underutilized parcels;
- Encourages reinvestment in neighborhoods;
- Promotes livable city and green initiatives;
- Provides seamless connection to LRT;
- Supports ASU travel demand; and
- Improves service for special events.

Downtown Alignment Alternatives – Mill Avenue Modern Streetcar

As a result of additional community feedback, a subsequent evaluation of modern streetcar alignment options was conducted within downtown Tempe. Three circulation options were evaluated north of University Drive; a double track alignment on Mill Avenue, a double track alignment on Ash Avenue, and a one-way loop northbound on Mill Avenue, westbound on Rio Salado Parkway, southbound on Ash Avenue and eastbound on University Drive. The evaluation criteria included ridership, land use, economic development, capital and operating costs, traffic impacts, utilities, special events, and parking. **Table 3** below compares and contrasts how well each downtown alignment alternative meets important community goals.

TABLE 3: Evaluation of Downtown Alignment Alternatives

| Evaluation Criteria | Mill Avenue Double Track | Ash Avenue Double Track | Mill / Ash One-Way Loop |
|----------------------------------|--------------------------|-------------------------|-------------------------|
| Utility Avoidance | - | + | + |
| Capital Costs | - | ○ | + |
| Ease / Flexibility of Operations | ○ | + | + |
| Access to Maintenance Yard | + | - | + |
| Economic Development Potential | ○ | + | ○ |
| Passenger Way-Finding | + | + | ○ |
| Impact to Existing Streetscape | - | + | + |
| Construction Disruption | - | + | + |
| Proximity to Neighborhoods | ○ | + | + |

Ratings:

| | | |
|---|---|--|
| + | = | Alternative would have greater benefit (or lesser adverse impact) related to the other alternatives. |
| ○ | = | Alternative would not produce a significant change from the future no-build conditions or would have a moderate impact relative to the other alternatives. |
| - | = | Alternative would have a lesser benefit (or greater adverse impact) than the other alternatives. |

Rural Road Bus Rapid Transit (BRT)

In an the effort to balance the regional Transit Life Cycle Program (TLCP), funding for the Tempe and Chandler portion of the Rural Road BRT has been delayed beyond the 2026 funding program in the RTP. However, the Alternatives Analysis recommends this project for future implementation. The Rural Road BRT project includes: 10 minute peak service; all day service; traffic signal priority, reserved bus and right turn lanes between Baseline Road and University Drive; a limited number of stops; and bus stop improvements. Please refer to

Figure 4 for a map of this alternative. The BRT has a 2030 forecasted daily ridership of 5,200-5,700; please refer to **Table 4** below for riders per mile.

The 12-mile Rural Road BRT project has the following benefits:

- Enhances bus service levels;
- Relieves Rural Road bus overcrowding;
- Improves bus operating speeds in the corridor;
- Attracts a significant number of new transit riders;
- Provides seamless connections to LRT and other transit modes; and
- Better serves ASU, downtown Tempe, and Chandler Fashion Mall travel destinations.

TABLE 4: Forecasted ridership on Rural Road BRT

| | Year 2030 |
|----------------------------|------------------|
| Daily Ridership Estimates: | Rural Road BRT |
| Average daily ridership | 5,200-5,700 |
| Riders per mile | 440-480 |

PUBLIC & AGENCY PROCESS

METRO prepared a Public Involvement Plan for the study. The overall goal was to inform the residents, stakeholder interest groups, and involved agencies about the Tempe South Corridor Study and to present the alternatives and issues for public and agency review. During the course of the study, the public involvement team conducted ten public meetings with 446 people attending; over 47 presentations to advisory committees, neighborhood associations and civic organizations; and continuous updates via website, e-mails, newsletters and fact sheets.

Through the public outreach program, a general theme started to emerge in the feedback from the community. It centered on a few main points:

- Provide enhanced mobility options connecting to the regional transit system, accommodating for the current and future travel demand that exists within the study area;
- Connect residents and employment to the destination points within their community and to other regional centers; and
- Promote integration of fixed guideway and land use planning to support sustainability and livable community initiatives as well as economic development.

Project Schedule

Table 5 below outlines the project schedule for both the local/regional and federal processes.

TABLE 5: Tempe South Project Schedule

| <u>PROCESS / APPROVAL</u> | <u>TIMELINE</u> |
|--|---------------------------|
| LOCAL / REGIONAL | |
| Approvals | |
| - Tempe City Council | October 21, 2010 |
| - METRO Board (acceptance of study results only) | November 17, 2010 |
| - Chandler City Council | November 18, 2010 |
| - MAG Regional Council | December 8, 2010 |
| Project Design / Refinement | Fall 2010 – Winter 2013 |
| Right-of-way/Utilities/Construction | Spring 2013 – Winter 2016 |
| Project Opening | Late 2016 |
| FEDERAL | |
| Small Starts Project Development (PD) Process | |
| - Preparation of application to enter PD | Fall 2010 - Spring 2011 |
| - Submission of PD application | Spring 2011 |
| - Anticipated entry into Project Development | Fall 2011 |
| - Anticipated Project Construction Grant Agreement | Early, 2013 |

FINANCIAL IMPACTS

The TLCP includes \$162 million, in year of expenditure (YOE) dollars, for the development of the 2.6 mile modern streetcar project. Cost estimates for the project show a low estimate of \$151.0 and a high estimate of \$160.4 million in YOE dollars. Funding is programmed through a combination of regional Public Transportation Funds (PTF) and federal funding (both FTA Section 5309/Small Starts and CMAQ). Operating expenses are estimated at \$3.6 million in 2017 dollars for the modern streetcar and will be paid from fares and the Tempe Transit Fund. **Table 6** below outlines funding sources for the Modern Streetcar Project.

TABLE 6: Capital Funding Sources for Mill Avenue Modern Streetcar (YOE \$'s millions)

| FUNDING SOURCE | AMOUNT |
|--|--------------------------|
| Public Transportation Fund (PTF) | \$31.8 – 41.2 |
| Congestion Mitigation Air Quality (CMAQ) | \$44.2 |
| FTA Section 5339 / 5309 Small Starts | \$75.0 |
| TOTAL | \$151.0 – \$160.4 |

The TLCP does not currently include funding or a scheduled completion date for the Rural Road BRT project. Capital costs for this project are estimated to be \$60 - \$65 million in 2010 dollars. The annual Rural Road BRT operating cost is estimated to be \$3 - \$3.5 million in 2010 dollars, which includes the costs of BRT and Route 72.

Both projects are viable and should be implemented as funding permits. The City of Tempe and its' stakeholders are desirous of the BRT being advancing through implementation as soon as funds could be identified. Capital funding for high capacity transit in the Tempe South corridor remains within the rail portion of the TLCP and is scheduled for completion in 2016.

RECOMMENDATIONS:

For information, discussion, and recommendation to approve:

- 1) A Locally Preferred Alternative for the Tempe South project, including a modern streetcar on a Mill Avenue alignment with a one-way loop in downtown Tempe;
- 2) Inclusion of a potential future phase of modern streetcar east along Southern Avenue to Rural Road as an Illustrative Transit Corridor in the MAG Regional Transportation Plan;
- 3) Future consideration for increased service levels and capital improvements for Rural Road BRT, per the description provided herein, through the regional transportation system planning process;
- 4) Future consideration for high capacity transit needs north of downtown Tempe along Rio Salado Parkway and south of Southern Avenue along Rural Road to the vicinity of Chandler Boulevard through the regional transportation system planning process; and
- 5) Further consideration of commuter rail along the Tempe Branch of the Union Pacific Railroad, through the regional transportation system planning process, and pending results from the Arizona Department of Transportation's (ADOT's) Phoenix-Tucson Intercity Rail Alternatives Analysis.

FOR MORE INFORMATION

Additional information on the project will be provided at the meeting by METRO staff. If you have any questions, please contact Benjamin Limmer at 602-322-4487 or blimmer@metrolightrail.org. Additional information and updates can be found on the Tempe South website: www.MetroLightRail.org/tempesouth.

FIGURE 1 - TRAVEL MARKETS IN TEMPE SOUTH STUDY AREA

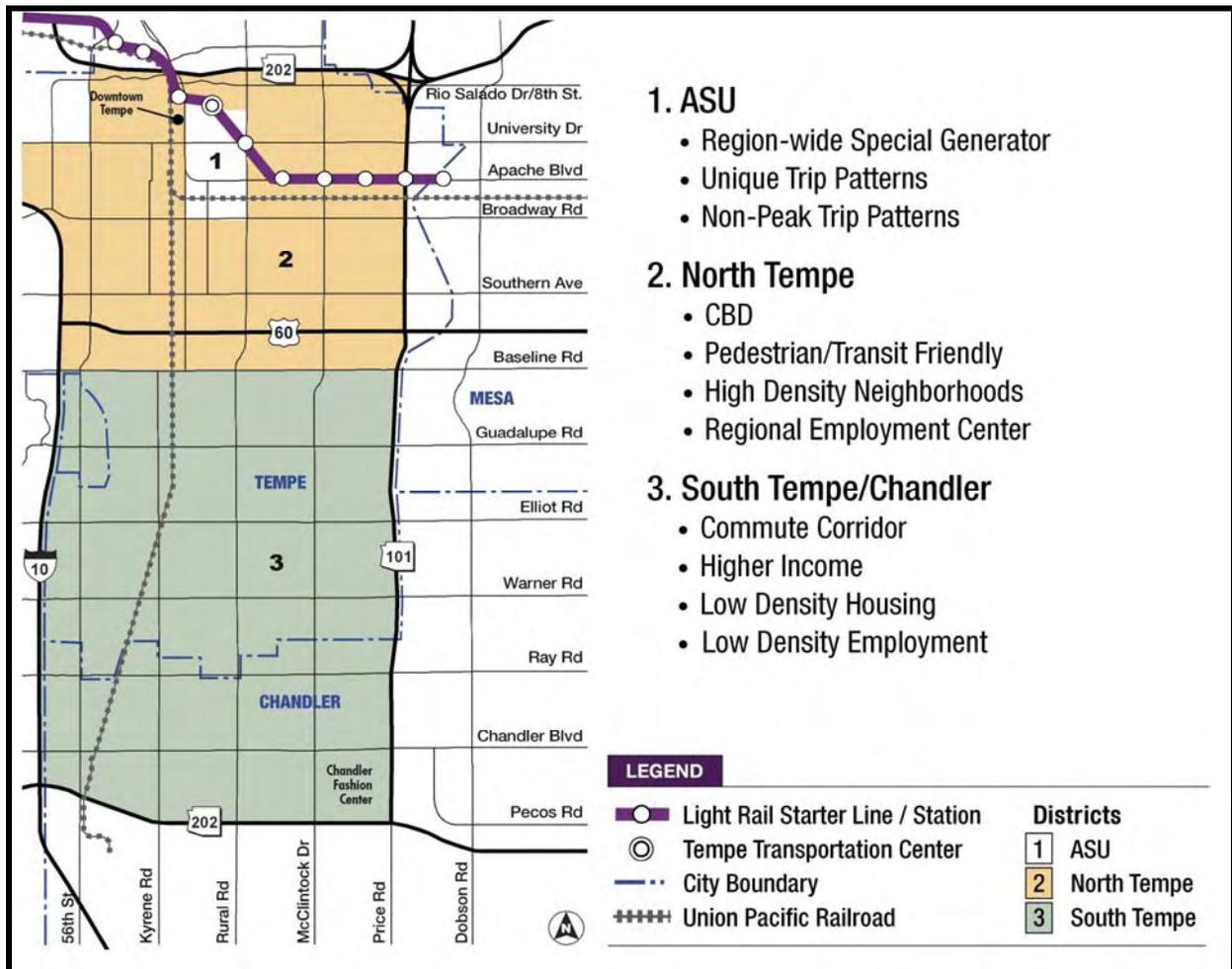


FIGURE 2 - PROPOSED TEMPE SOUTH LOCALLY PREFERRED ALTERNATIVE

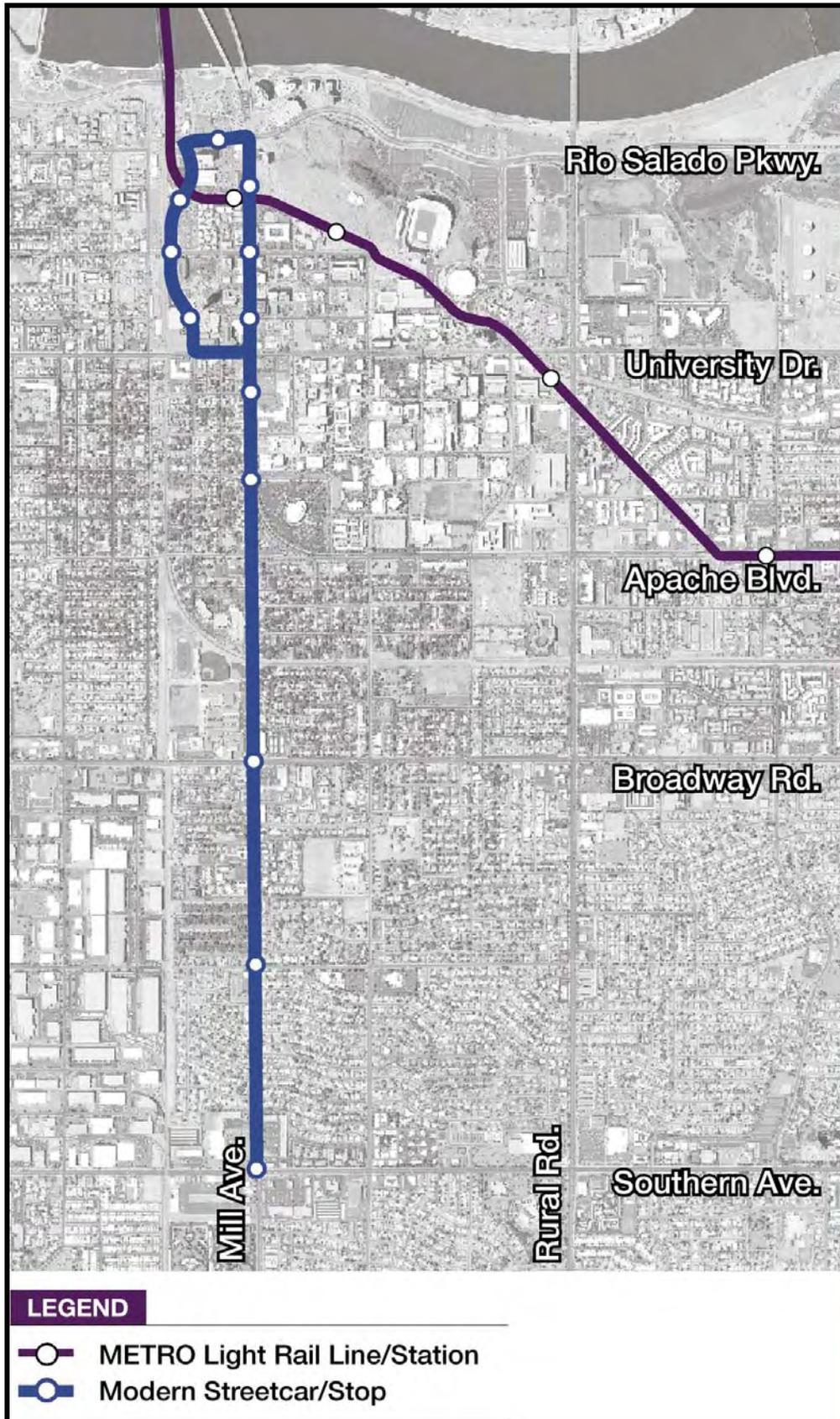


FIGURE 3 – DOWNTOWN MILL AVENUE / ASH AVENUE LOOP ALTERNATIVE

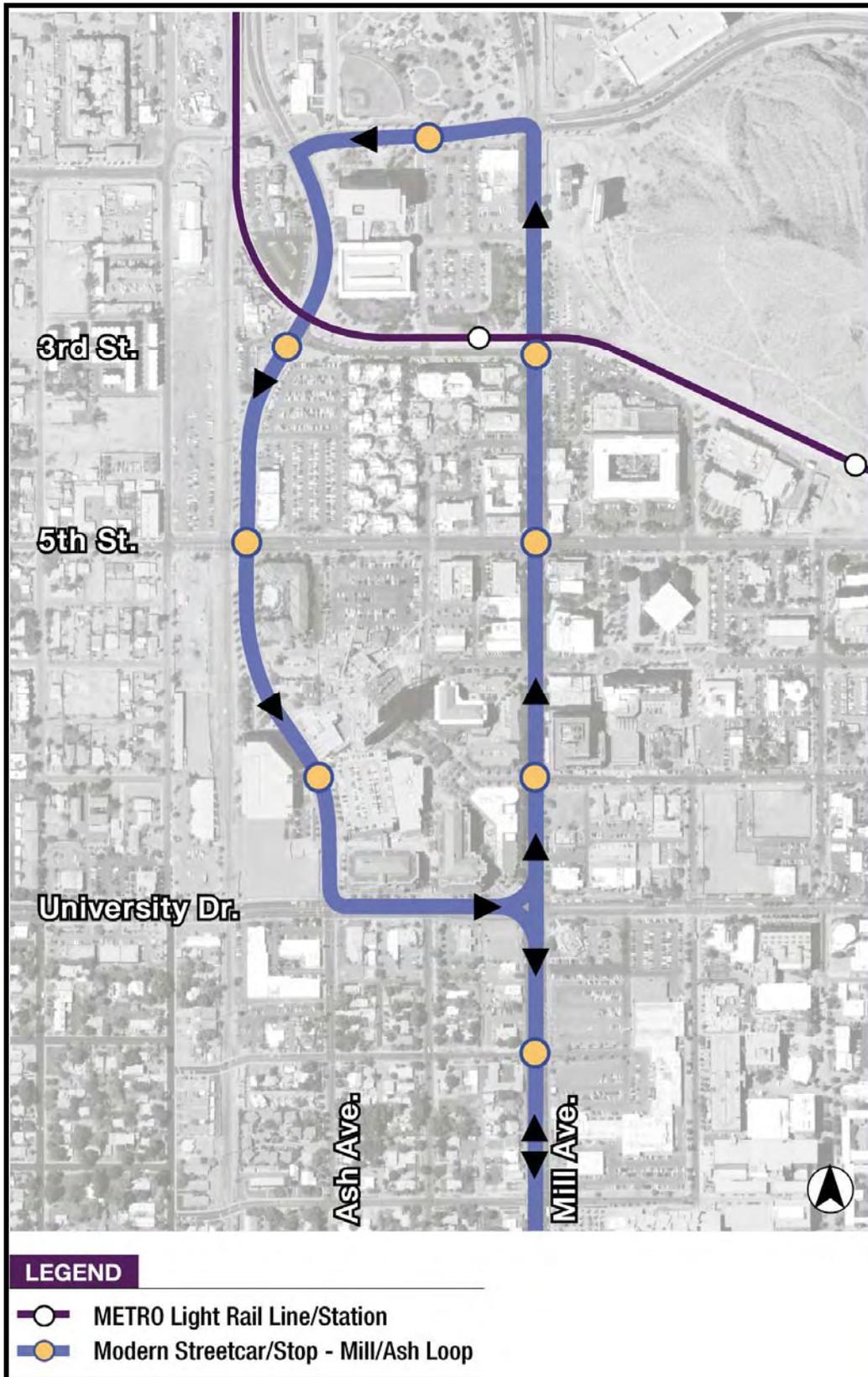


FIGURE 4 – PROPOSED RURAL ROAD BUS RAPID TRANSIT ALTERNATIVE (UNFUNDED)

