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Metcalfe Avenue and Shawnee Mission Parkway Alternatives Analysis



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ABOVE AND BEYOND. BY DESIGN.



Acknowledgements

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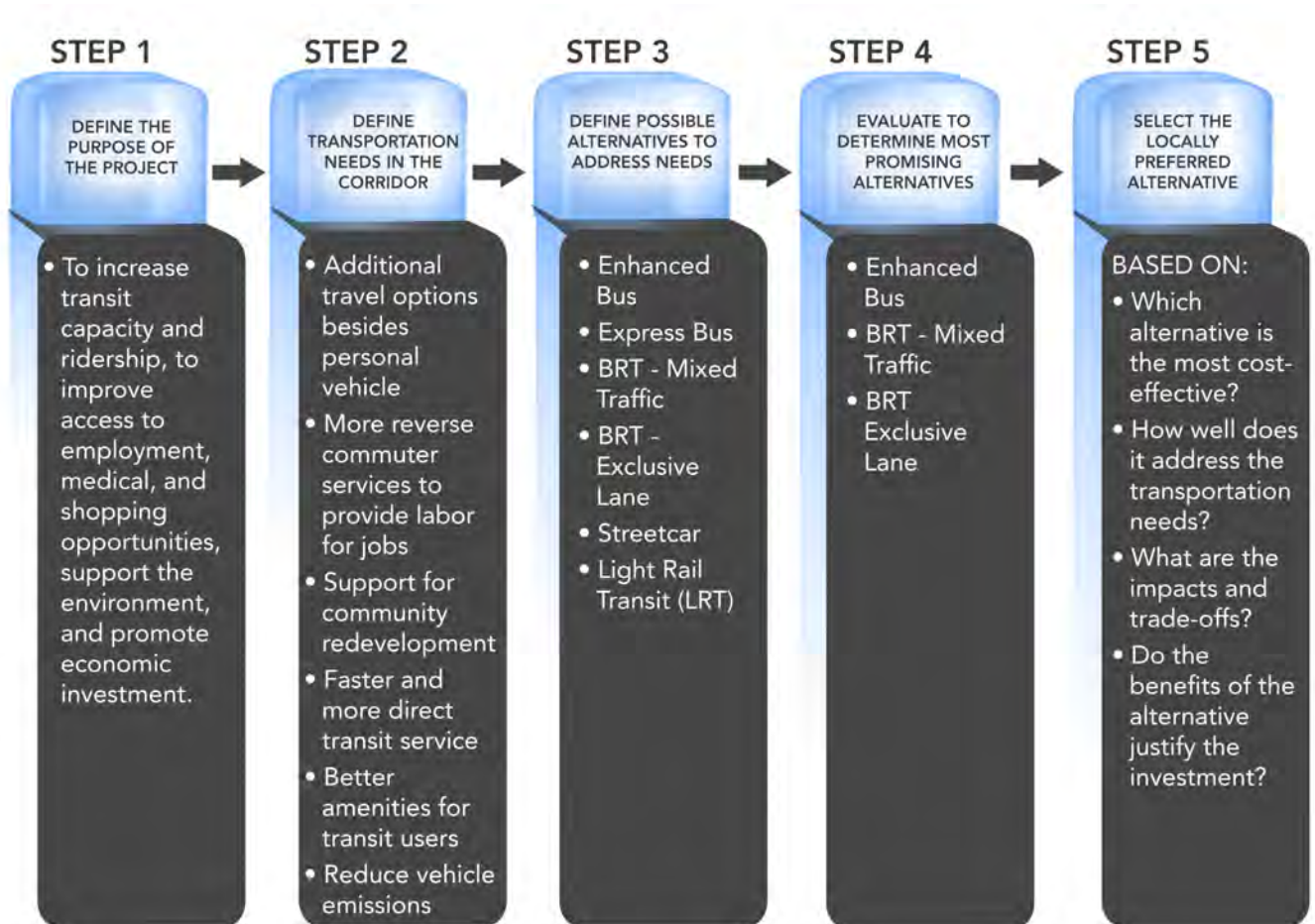
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Introduction

Johnson County Transit (JCT) and the cities of Overland Park and Mission, Kansas, in cooperation with the Kansas Department of Transportation (KDOT), and the Mid-America Regional Council (MARC), are considering alternatives to implement high capacity transit service in the Metcalf Avenue and Shawnee Mission Parkway corridors that would also connect to the Country Club Plaza in Kansas City, Missouri. This Alternatives Analysis was performed to assess the trade-offs in costs, benefits, and impacts of different transit modes that would provide enhanced transit service in the Metcalf Avenue and Shawnee Mission Parkway corridors. The Alternatives Analysis planning process is summarized in Figure 1.

An Alternatives Analysis is the first step of the project development process that has been developed by the Federal Transit Administration (FTA) for major transit projects. These transit projects are typically funded through a federal funding category called New Starts, or a sub-category called Small Starts. The final outcome of the Alternatives Analysis is the selection of a Locally Preferred Alternative (LPA). The LPA indicates how local agencies, local officials, and community citizens desire to address transit needs with local and federal resources.

Figure 1: Alternatives Analysis Planning Process

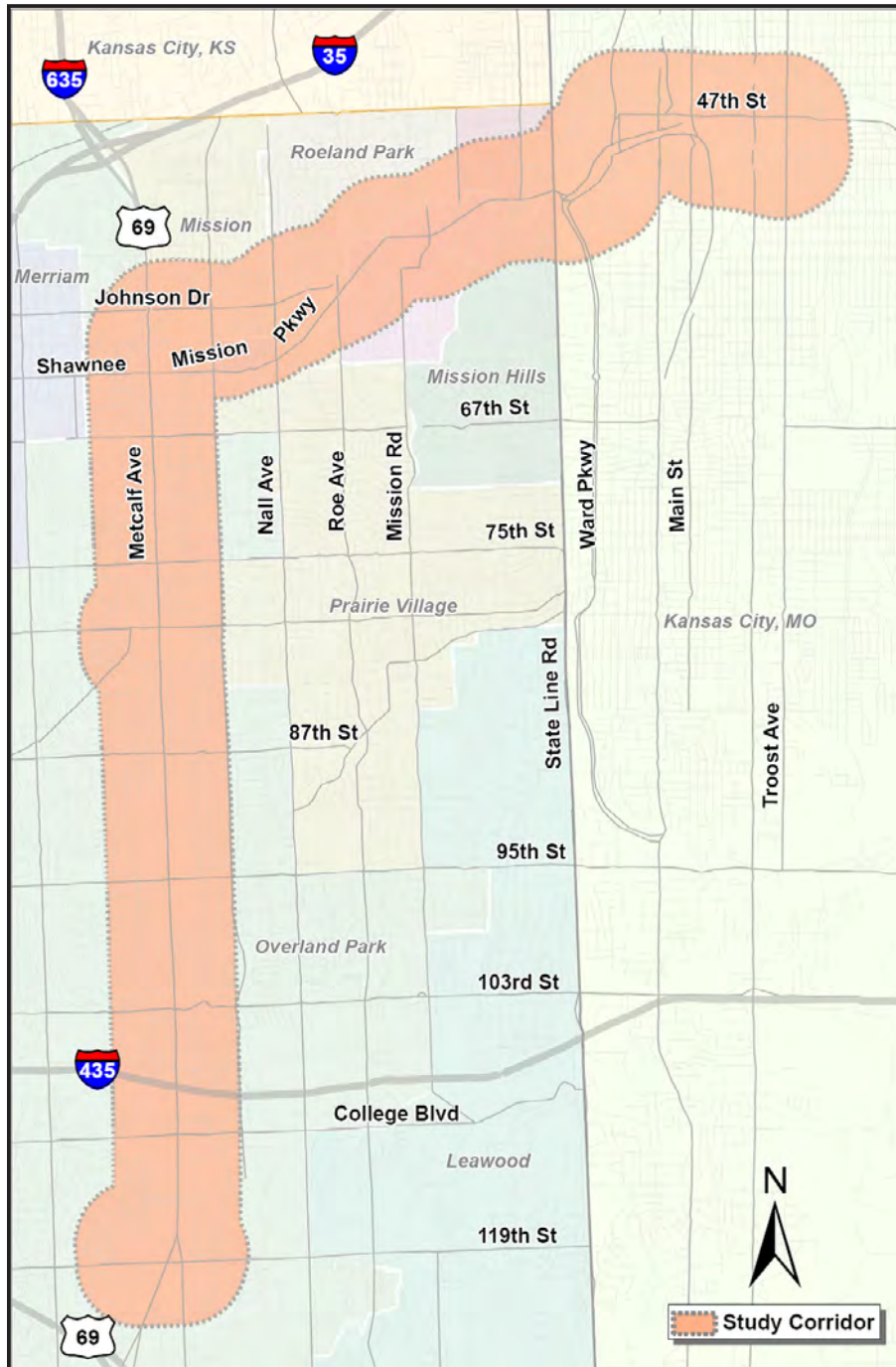


Existing Transportation Conditions

Study Area

The study area connects Overland Park, Mission, Fairway, Roeland Park, Westwood, the Country Club Plaza, UMKC, and the Troost Avenue corridor in Kansas City, Missouri. The study area includes a half-mile on each side of Metcalf Avenue, from 119th Street in Overland Park to Martway Street in Mission and from Shawnee Mission Parkway from Metcalf Avenue in Mission to 47th Street and Troost Avenue in Kansas City, Missouri. The study area is shown in Figure 2.

Figure 2: Study Area



Current Transit Investment

Transit investments are now being made in this corridor. Based on results of the Metcalf Avenue and Shawnee Mission Parkway Transit Planning Study (completed in 2009), the corridor was included in a TIGER grant submitted by the Mid-America Regional Council to the FTA, resulting in an award of \$10.7 million to construct transit and pedestrian infrastructure. The purpose of this Alternatives Analysis examines other long-term investment options that can lead to even greater improvement in transit service.

TIGER funded improvements include:

- Park & Ride Lots: Park & Rides at Rosana Square and at Metcalf South Mall will be improved.
- Transit Stations: Nine station pairs will be constructed, providing enhanced bus shelters, lighting, unique branding, and real-time arrival signs. (See Figure 3).
- Mission Transit Center: A site in downtown Mission is becoming a transit center that will provide convenient transfers between buses. (See Figure 4).
- Transit Signal Priority System: This system will improve transit reliability by either extending green signals or shortening red signals when transit vehicles are behind schedule.
- Pedestrian Enhancements: Pedestrian and bicycle infrastructure improvements are being provided along Metcalf Avenue and in the West Gateway area of Mission.

Figure 3: Planned Transit Station



Figure 4: Planned Mission Transit Center

Current Transit Conditions

A review of current transportation conditions and future plans indicated the following:

- The corridor is an important part of JCT's Strategic Plan, and an enhanced transit route in the Metcalf Avenue and Shawnee Mission corridors will serve many major destinations and employment centers.
- Population and employment are forecasted to grow throughout the corridor.
- Current transit service in the corridor is primarily limited to serving commuters during peak travel periods. Transit service levels provide only limited service during the midday and service on evenings or weekends.
- Community leaders view transit as a major impetus for redevelopment throughout the corridors.
- Peak period traffic flow in much of the corridor is congested, with little opportunity to increase roadway capacity.
- Access to employment is limited by current transit service.

Purpose of the Project

The following purpose of the study was developed by the Study Management Team and reviewed by the public at open houses:

The purpose of the project is to increase transit capacity and ridership by providing safe and effective transit service options that are more competitive with automobile travel for residents, workers, and visitors traveling within the corridors. This increased transit service will improve access, support the environment, and promote economic investment in the community.

Alternatives Considered

The first step in the process involved defining possible transit modes, technology, and alignment locations within the corridor. Initially, seven transit alternatives or modes were identified as having the potential to meet the purpose and need for the study. An initial evaluation was completed to narrow the number of alternatives to be considered. These alternatives were then refined in greater detail. The analysis of the refined alternatives was then completed to identify the Locally Preferred Alternative (LPA).

Initial Transit Alternatives

The following alternatives were considered:

- Baseline (no-build) – current service levels
- Enhanced bus – increasing service levels, but not adding capital improvements
- Express bus - increasing the amount of limited stop service to downtown Kansas City, Missouri
- Bus Rapid Transit (BRT) in Mixed Traffic– providing more frequent bus service, and making capital improvements similar to the BRT routes in Kansas City, Missouri
- BRT with Exclusive Lane – providing more frequent bus service, but providing a designated lane for bus use for all or part of the day
- Streetcar – using streetcars, placing rail lines and constructing stations to provide the transit service in the corridor
- Light Rail Transit (LRT) – using LRT vehicles, placing rail lines and constructing stations to provide the transit service in the corridor

Each transit alternative was rated according to the following eight previously established goals:

- Goal 1: Improve Transit Effectiveness
- Goal 2: Improve Transit Service Quality
- Goal 3: Support Planned Land Use Patterns
- Goal 4: Improve Travel Connectivity
- Goal 5: Improve Access to Major Employers and Destinations
- Goal 6: Support Economic Development
- Goal 7: Contribute to Improving the Environment
- Goal 8: Provide Cost-Effective Transit Solutions

Most Promising Alternatives

Three alternatives were identified as the most promising to address the transportation needs in the Metcalf Avenue and Shawnee Mission corridors.

Baseline Alternative

This alternative includes any existing transit facilities in the study corridor, including a transit center, two park & ride lots, and nine transit stations/shelters funded as part of the TIGER grant. Vehicles from the existing JCT fleet would be used in the baseline alternative. Service levels would be the same as currently provided from the *Route 556/856 Metcalf-Plaza*. A photo of the existing service is shown in Figure 5.

Figure 5: Existing service at the 6000 Lamar Transit Center.



Bus Rapid Transit (BRT) in Mixed Traffic Alternative

BRT is a flexible, rubber-tire rapid-transit service that combines stations, vehicles, services, and ITS elements into an integrated transit service. This alternative builds upon the Baseline Alternative by constructing three additional station pairs, enhancing the signal priority for transit vehicles, and increasing the frequency of service to 30 minutes during the day and 60 minutes in the evening and on weekends. In this alternative, a more distinctive transit vehicle would be purchased to use on this route. A photo of BRT mixed traffic service in Los Angeles, California, is shown in Figure 6. Figure 7 provides one example of a distinctive BRT vehicle that could be used.

Figure 6: Example of BRT Mixed Traffic



Figure 7: Example of a Distinctive BRT Vehicle



Bus Rapid Transit (BRT) with Exclusive Lane

The BRT with Exclusive Lane options provides median running and curb running lanes restricted for transit vehicles. Such lanes require new construction or, in some cases, could be achieved by converting an outside lane of mixed traffic to a lane reserved for transit vehicles for either a part of or the entire day. Transit lanes enhance transit operating speed, service reliability, and BRT identity. Exclusive lanes can be constructed either as curb running or median running. Curb running transit lanes could be provided by converting an outside lane of mixed traffic to a lane reserved for transit vehicles for a part of or the entire day or by widening the roadway and adding a transit lane on each side of the roadway (See example layout in Figure 8). A median running guideway would involve constructing transit lanes and stations in the median area of the roadway

(see example layout in Figure 9). Frequency would be 20 minutes during peak, 30 minutes during off-peak, and 60 minutes evenings and weekends.

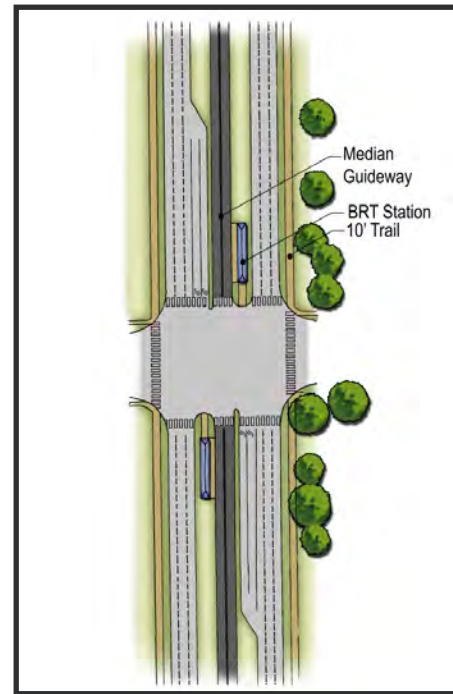
Six sub-alternatives were developed, which specify different lengths of the guideway in order to vary travel time and potential property impacts:

Figure 8:
Example of Median Running Transit Lanes

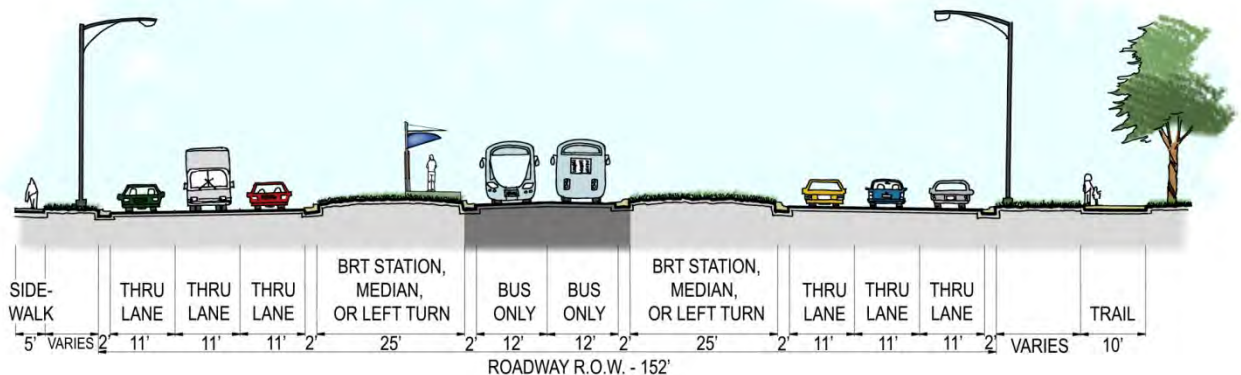
Median Running Option A – Along Metcalf Avenue and Martway Street

Median Running Option B – Along Metcalf Avenue only

Median Running Option C – Along Metcalf Avenue between 87th Street and College Boulevard.



Median Running BRT Typical Section



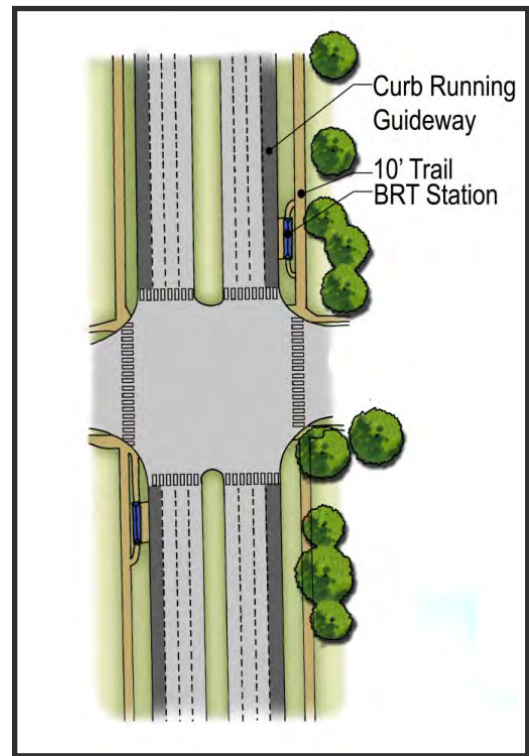
Source: Olsson Associates

**Figure 9:
Example of Transit Lanes in the Curb**

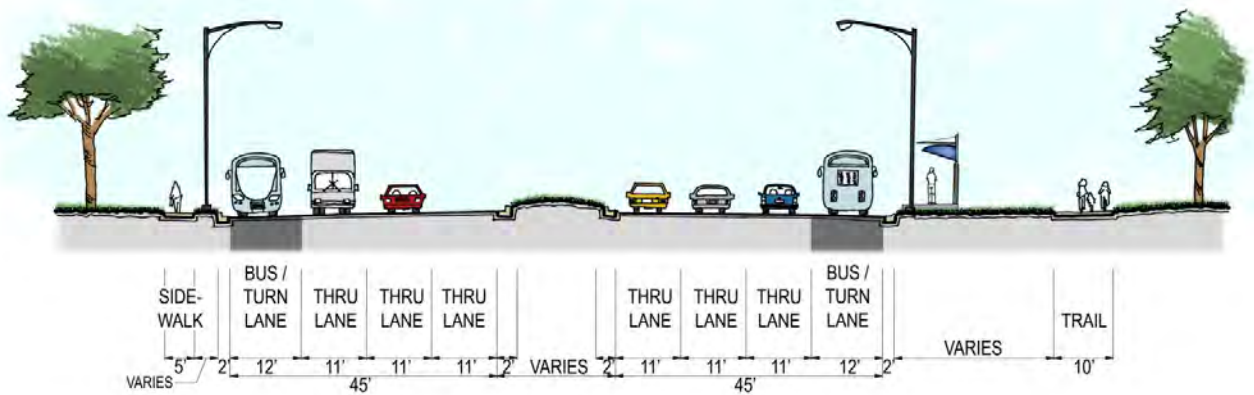
Curb Running Option A – Along Metcalf Avenue and Martway Street

Curb Running Option B – Along Metcalf Avenue

Curb Running Option C – Along Metcalf Avenue between 71st Street and 75th Street, and between 87th Street and College Boulevard.



Curb Running BRT Typical Section



Source: Olsson Associates

Alternatives Evaluation

Each transit alternative was evaluated according to purpose and need, capital and operating costs, cost-effectiveness, impacts on pedestrians, property impacts and access, land-use compatibility, ridership, and environmental considerations.

Ridership for the Baseline Alternative is approximately 500 riders per day. Ridership for BRT alternatives range from approximately 1,140 for BRT Mixed Traffic to 1,380 for Median Running Option A.

The property impacts associated with the guideway alternatives are significant enough to be a local concern due to additional right-of-way required. The BRT Mixed Traffic alternative produces only minor property impacts at specific station locations.

Traffic access issues related to the median alternatives are a concern, particularly with Median Running Option A and Median Running Option B. The BRT Mixed Traffic alternative maintains the current traffic access level.

Travel time benefits were shown to be greater for the guideway alternatives. Greater travel time benefits make transit more competitive with automobile travel. BRT Mixed Traffic alternative does increase travel time benefits over the existing service due to more direct routing, TSP technology, and limited stops.

The level of capital costs associated with the guideway alternatives were a concern, particularly with the current impact of the economy on local tax revenues. BRT Mixed Traffic has lower capital costs than the guideway alternatives.

The BRT Mixed Traffic Option was shown to provide a comparable level of benefit of guideway alternatives, at a lower capital cost.

Locally Preferred Alternative

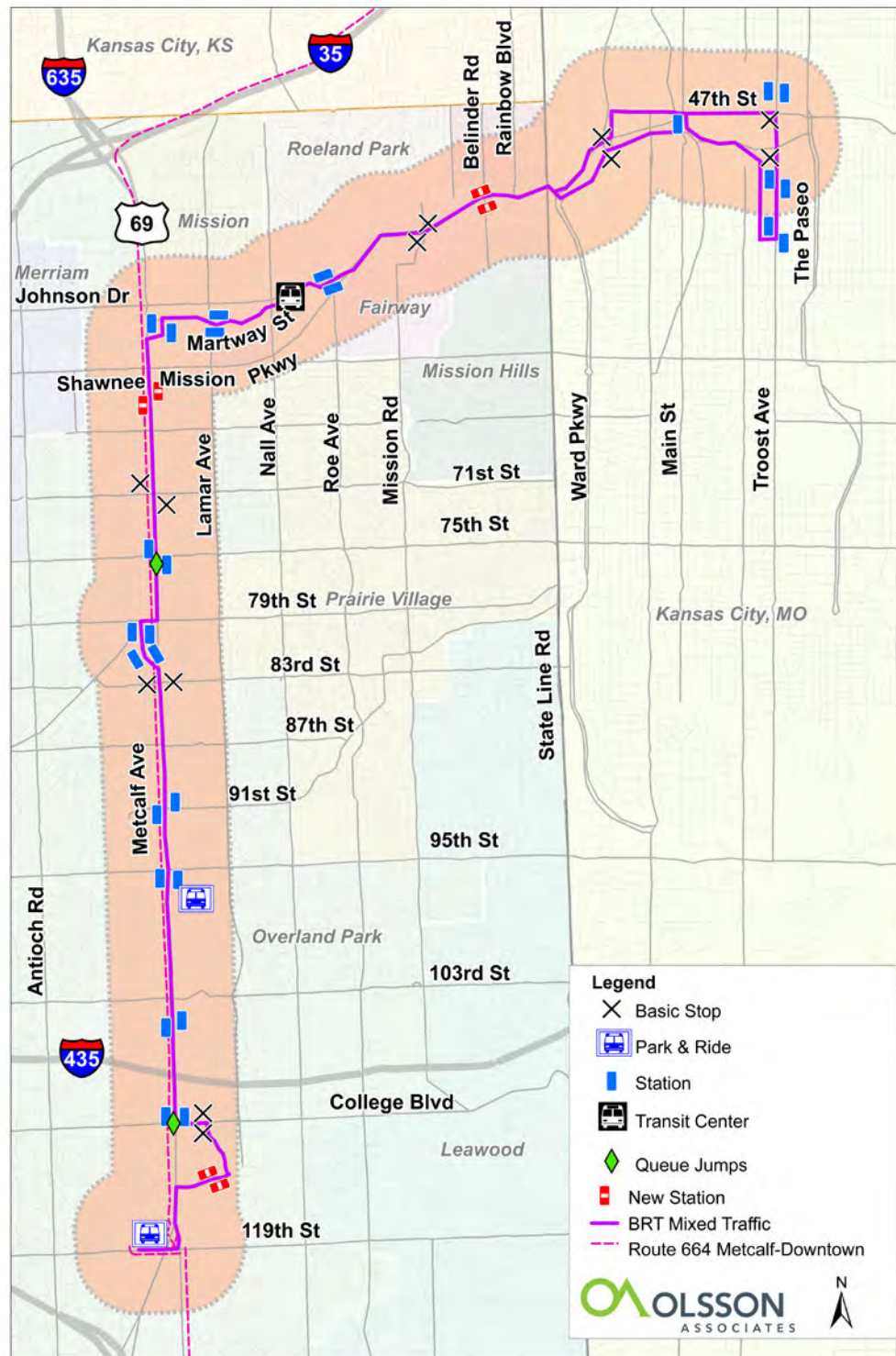
The BRT Mixed Traffic alternative was selected as the Locally Preferred Alternative. The Locally Preferred Alternative will be included in the Mid-America Regional Council's long-range transportation plan.

The LPA includes the following:

- The route for this BRT Mixed traffic service would extend between 119th Street and Metcalf Avenue in Overland Park to 47th Street and Troost Avenue in Kansas City, Missouri.
- Additional transit station/shelter pairs would be constructed in the corridor and would have next-bus arrival information.
- A Real-Time Vehicle Location System would send estimated arrival times to dynamic digital displays at downstream transit stations based on the transit vehicle's current location and travel speed.
- Distinctive Low Floor Vehicles will be used to provide service for the BRT Mixed Traffic alternative. They will include both vehicles in service and spare vehicles.
- Phase 1 of the service would operate at a 30-minute frequency during the day and a 60-minute frequency at other times. Future phases will increase midday frequency and add evening and weekend service.
- Service would be coordinated with the Main Street MAX and the Troost MAX to facilitate regional transit connections.

- BRT service would connect with other JCT transit routes at the new Mission Transit Center.
- Transit Signal Priority (TSP) technology would continue throughout the corridor.
- In the longer term, a fixed guideway will be reconsidered as higher development density occurs in the corridor.

Figure 10: Locally Preferred Alternative



Implementation Phases

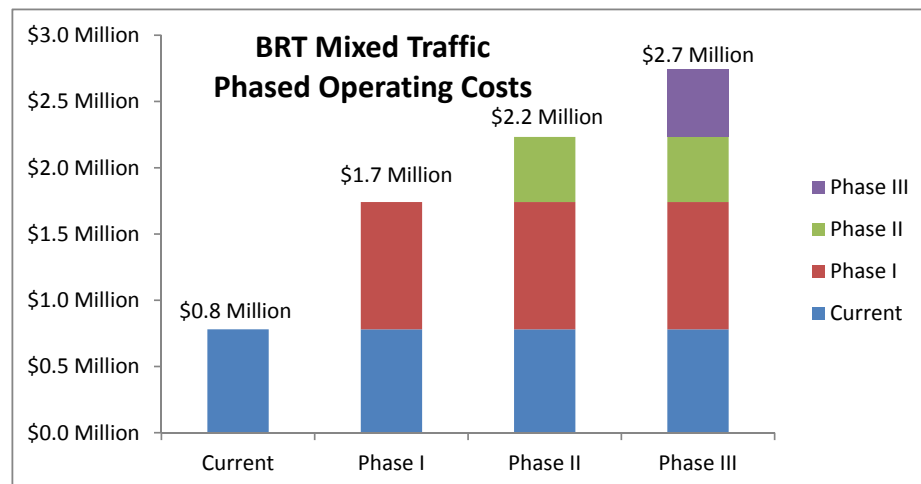
BRT service can be implemented through a phased approach stretching over several, or by immediately increasing service to operate at the designated levels. Service could be increased in three phases:

Phase 1 – Increase daily transit trips from the current 26 trips to 38 trips. Annual operating costs would increase by \$290,000 for fixed route service, and \$670,000 for corridor paratransit service.

Phase 2 – Increase midday frequency to 30 minutes, increasing daily trips to 54. Annual operating costs for this phase would increase by \$490,000.

Phase 3 – Add weekend service, and increase daily service trips to 62. Annual operating costs for this phase would increase by \$510,000.

Figure 11: BRT Mixed Traffic Phased Operating Costs



Funding Options

Rather than entering into Small Start project development, multiple funding sources can be explored to fund the capital and the operating elements of the BRT Mixed Traffic Alternative. Earmark allocation through the FTA Section 5309 Capital Investment Grant Program is the most viable funding source for new vehicle purchases and station construction. A combination of funding from CMAQ, T-Works, and other sources could fund the remainder of station construction costs.

Funding for operating costs will need to come from primarily local funding sources. Johnson County or the cities in the corridor will need to explore ways to increase funding for transit operations to operate the BRT Mixed Traffic Alternative. Local funding decisions will be critical for implementing this alternative.

Transit Supportive Actions

Transit supportive actions were also discussed. Creating walkable communities with a mix of land uses near transit stations is a strong long-term strategy that will not only support transit ridership, but also the economic development and environmental sustainability of the corridor. Implementing Vision Metcalf and the Mission Gateway Plans will help create a stronger transit environment that will complement the BRT Mixed Traffic transit service identified as the Locally Preferred Alternative. It will also set the ground work for considering a transit guideway in the future.