

Executive Summary

Introduction

The *Metcalf Avenue and Shawnee Mission Parkway Transit Planning Study* analyzes and presents options to evolve transit service along the Metcalf Avenue and Shawnee Mission Parkway corridors in the context as presented in *Vision Metcalf*, the *West Gateway Vision Plan*, and the *East Gateway Redevelopment Plan*. The purpose of this study is to provide a more detailed assessment of potential strategies that would improve transit services within these two corridors. This study was a collaborative effort by Johnson County Transit (JCT), the City of Mission, Kansas, and the City of Overland Park, Kansas. The study was completed with the assistance of the Kansas Department of Transportation (KDOT) and the Mid-America Regional Council (MARC).

Significant changes are anticipated for the land use and density of the Metcalf Avenue and Shawnee Mission Parkway corridors. *Vision Metcalf*, the *West Gateway Vision Plan*, and the *East Gateway Redevelopment Plan* seek to revitalize the corridor and show a conversion to a more dense development character. The higher density development will provide an opportunity for transit to serve a larger portion of mobility needs in these corridors. In addition, transit service along Metcalf Avenue and Shawnee Mission Parkway is seen as becoming the spine of an enhanced transit network for Johnson County.

The study begins with a review of different transit options including improved local and express bus service, Bus Rapid Transit (BRT), Light Rail Transit (LRT), street car, development of new transit centers, and improvement of existing park-and-ride lots. Based upon this initial review, the BRT option was examined in greater detail. The study has been conducted in a manner that is consistent with Federal Transit Administration (FTA) study procedures.

Purpose of the Project

The purpose of the study is to identify a transit strategy that will increase transit capacity and ridership by providing safe and effective transit service options that are competitive with automobile travel for residents, workers, and visitors traveling within the corridor in a way that improves access, supports the environment, and promotes economic investment in the community.

Current Transit Needs

The following transit needs exist within the two corridors:

Expanded Transit Service – Existing span of service is limited to peak hour operation with some mid-day service and as such does not meet all of the needs of County residents and employers. Opportunities to increase the times of operation for transit operation within the study area should be explored.

Expanded Job Access Opportunities – The ability of those living outside of the study area to access jobs by transit within the study area is often limited and requires long travel times when service is provided. In addition, lack of evening or weekend service

also limits employment transit travel. As such, employers in the corridor do not fully benefit from transit service.

Faster Travel Time – Travel times are much greater for transit travel as compared to automobile travel resulting in a disincentive for transit use, particularly with potential choice transit riders.

Improved Transit Amenities – Transit amenities, such as shelters, benches, info kiosks, etc., are limited with the exception of the 6000 Lamar Transit Center and the part of the study area that encompasses the urban core. Amenities are vital to providing a base level of transit service to attract choice transit riders and to provide a comfortable environment for all passengers waiting to board transit vehicles.

Better Connectivity to the Regional Transit System – While coordination and connections between the three transit providers, Johnson County Transit (JCT), Unified Government Transit, and the Kansas City Area Transportation Authority (KCATA) exist, the ability to travel throughout the region can be difficult due to indirect routing, lack of transfer opportunity, limits to service frequency and service span, and because of limitations to coordination. Improvements to the connectivity and frequency of service are essential to supporting the anticipated densities and growth along the spine of the transit network.

Improve Air Quality – Vehicle exhaust emissions must be reduced in order to meet air quality standards.

Transit Concepts

A range of potential transit options were considered for application in the Metcalfe Avenue and Shawnee Mission Parkway corridors:

- Baseline (no-build);
- Enhanced bus;
- Express bus;
- Bus Rapid Transit (BRT) in mixed traffic;
- Bus Rapid Transit (BRT) with exclusive guideway elements;
- Streetcar; and
- Light Rail Transit (LRT).

Screening Criteria

Each of the seven transit alternatives was rated according to the following eight previously established goals:

- Improve transit effectiveness;
- Improve transit service quality;
- Support planned land-use patterns;
- Improve travel connectivity;
- Improve access to major employers and destinations;
- Support economic development;
- Contribute to improving the environment; and

- Provide cost-effective transit solutions.

Based on the evaluation, a BRT (mixed traffic) route was determined to be the most appropriate mode to advance for the near-term in the Metcalfe Avenue and Shawnee Mission Parkway corridors. Of the higher capacity modes, such as LRT, streetcar, and BRT (exclusive lane), the plan envisions moving toward an exclusive lane BRT option in the long-term.

Near-term Phase

The near-term phase describes transit improvements that can begin to be implemented within a two year time frame and then evolve over the following years as demand increases.

In this phase, the level of transit service in peak periods will increase over current levels and off-peak transit service will be introduced. The service concept includes retaining the current *Route C - Metcalfe - Downtown* and replacing *Route H - Metcalfe - Plaza* with peak hour and all-day service configured to operate in a BRT (mixed traffic) mode connecting the Plaza to Rosana Square with slightly higher frequencies between the Plaza and downtown Overland Park. Figure ES.1 displays the conceptual alignment.

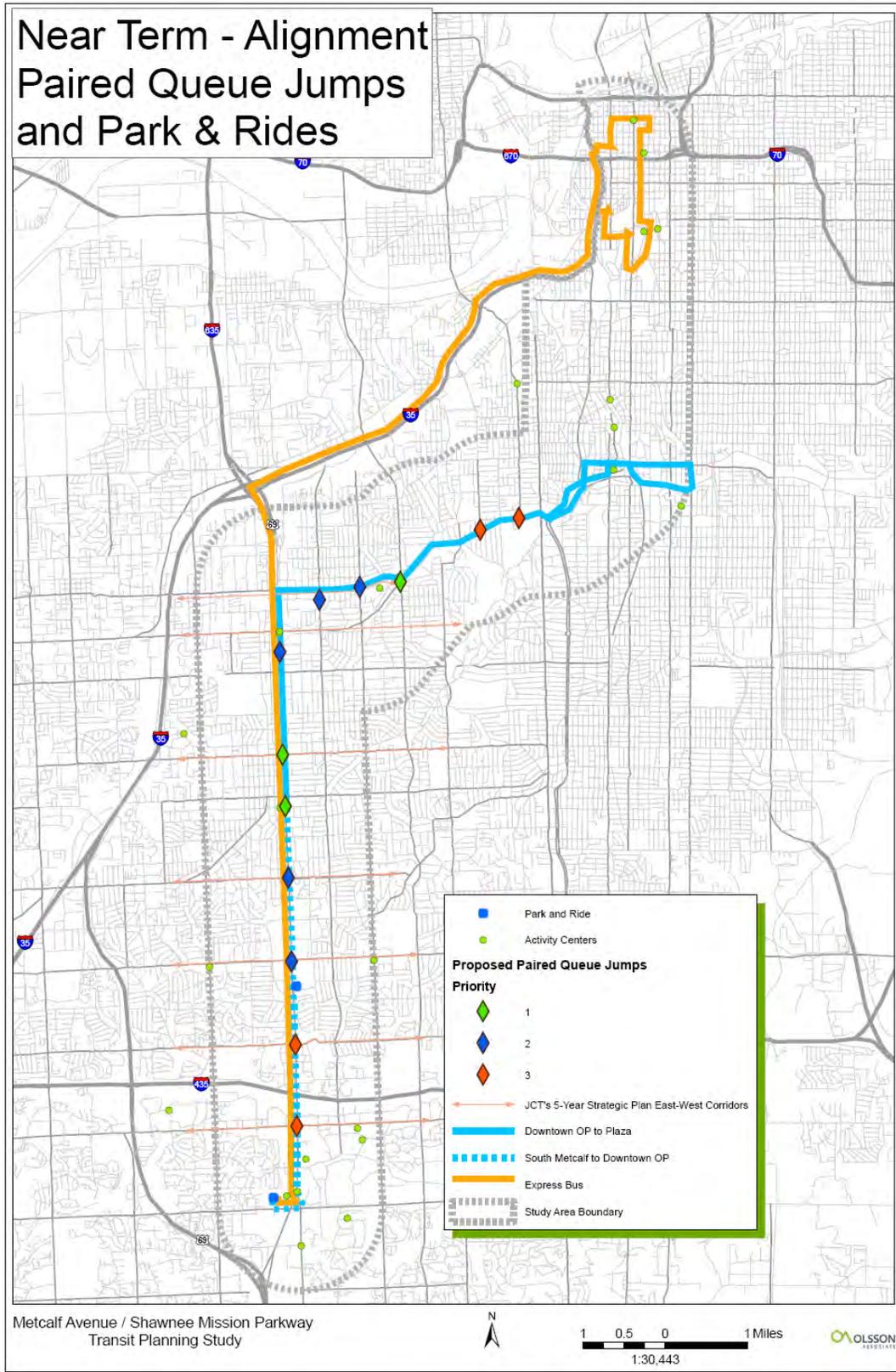
Downtown Overland Park was chosen as a major transit point for the near-term phase because the current land use features a high degree of walkability, affordable housing, and mixed housing. These same aspects are emphasized and enhanced in *Vision Metcalfe* which also specifically mentions a BRT stop along Metcalfe Avenue, two blocks from Downtown Overland Park.

Roundtrip express buses from downtown Kansas City, Missouri to south Metcalfe Avenue will increase service span by adding one southbound run and one northbound run in each direction during the peak periods and will have a service span of 6:00 a.m. to 9:00 a.m., and 3:00 p.m. to 6:00 p.m., with 30 minute frequency.

Features of the near-term service include:

- Enhanced stations complete with shelters, benches, and iconic markers at the major transit points (see example in Figure ES.2).
- Automatic vehicle location (AVL) systems on vehicles will be linked with displays at the enhanced stations to give waiting passengers real time vehicle location information and arrival time estimates.
- Transit Signal Priority (TSP) technology through the route corridor to increase service reliability.
- Enhanced park & ride lots which will feature monument signs, shelters, and schedules and include real-time information kiosks at Rosana Square, Metcalfe South Shopping Center and in Mission.

Figure ES.1 Near-term Transit Concept



Features of the near-term service (cont.):

- Additional way finding signs will direct riders to enhanced park & ride lots.
- Use of low floor distinctive vehicles and consideration of clean vehicles (e.g. low-sulfur diesel fuel, diesel-electric hybrids, compressed natural gas, and possibly fuel cells in the future). An example is shown in Figure ES.3.
- Phased construction of 24 queue jumps at 12 key intersections to increase schedule reliability throughout the corridor.
- Unique branding, including specialized logos and distinctive vehicles, that create a unique identity by establishing a brand and a theme that patrons recognize and associate with the positive attributes of a BRT system.

Near-term Phase Costing

Operating Costs

Operating costs are determined by annual platform miles, hours of each service, and include direct and indirect labor costs, fuel, tires, and overhead costs. Total estimated annual operating cost for the near-term phase is \$2,025,000. This estimated operating cost reflects BRT weekday, Saturday, and Sunday/holiday service and express bus weekday-only service.

Capital Costs

The near-term phase will add vehicles, operating hours, and passenger amenities to the current system. The added service frequency requires ten BRT vehicles and four additional standard buses for the express service. Express bus service will use vehicles similar to the 40' low-floor vehicles currently utilized in the Johnson County system. The cost estimate assumes use of highly distinctive transit vehicles. Total vehicle requirements and other associated costs are estimated at \$20,975,265.

Long-term Phase

The long-term phase will bring significant infrastructure investment to implement a higher capacity BRT (exclusive lane) mode. An example of a fixed-guideway service is shown in Figure ES.4. The service plan will still function on a Metcalfe Avenue and Shawnee Mission Parkway axis and connect the 119th Street area to the Plaza, with express service continuing to be provided from Rosana Square to downtown Kansas City, Missouri. The roundtrip express bus service will continue to provide a “one seat ride” from downtown KCMO to Rosana Square during peak periods at 30 minute frequencies and will utilize the length of Metcalfe Avenue in the corridor and I-35. Figure ES.5 displays the conceptual alignment.

Figure ES.2 – Typical BRT Station



Source: Olsson Associates

Figure ES.3 – Typical BRT Vehicle



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Figure ES.4 – Exclusive Lane BRT



Source: *Characteristics of Bus Rapid Transit, FTA*

Features of the long-term service include:

- A transit spine between Rosana Square and the Plaza along Metcalf Avenue, Martway Street, and Shawnee Mission Parkway. This feature will ensure highly reliable and frequent transit connections to outlying bus routes.
- Service frequency would increase from the near-term BRT phase, providing 10 minute peak headways and 15 minute off-peak headways.
- Transit stations fully developed as envisioned in the *East Gateway Redevelopment Plan* at Martway Street and Roeland Drive.

Long-term Service Phase Costing

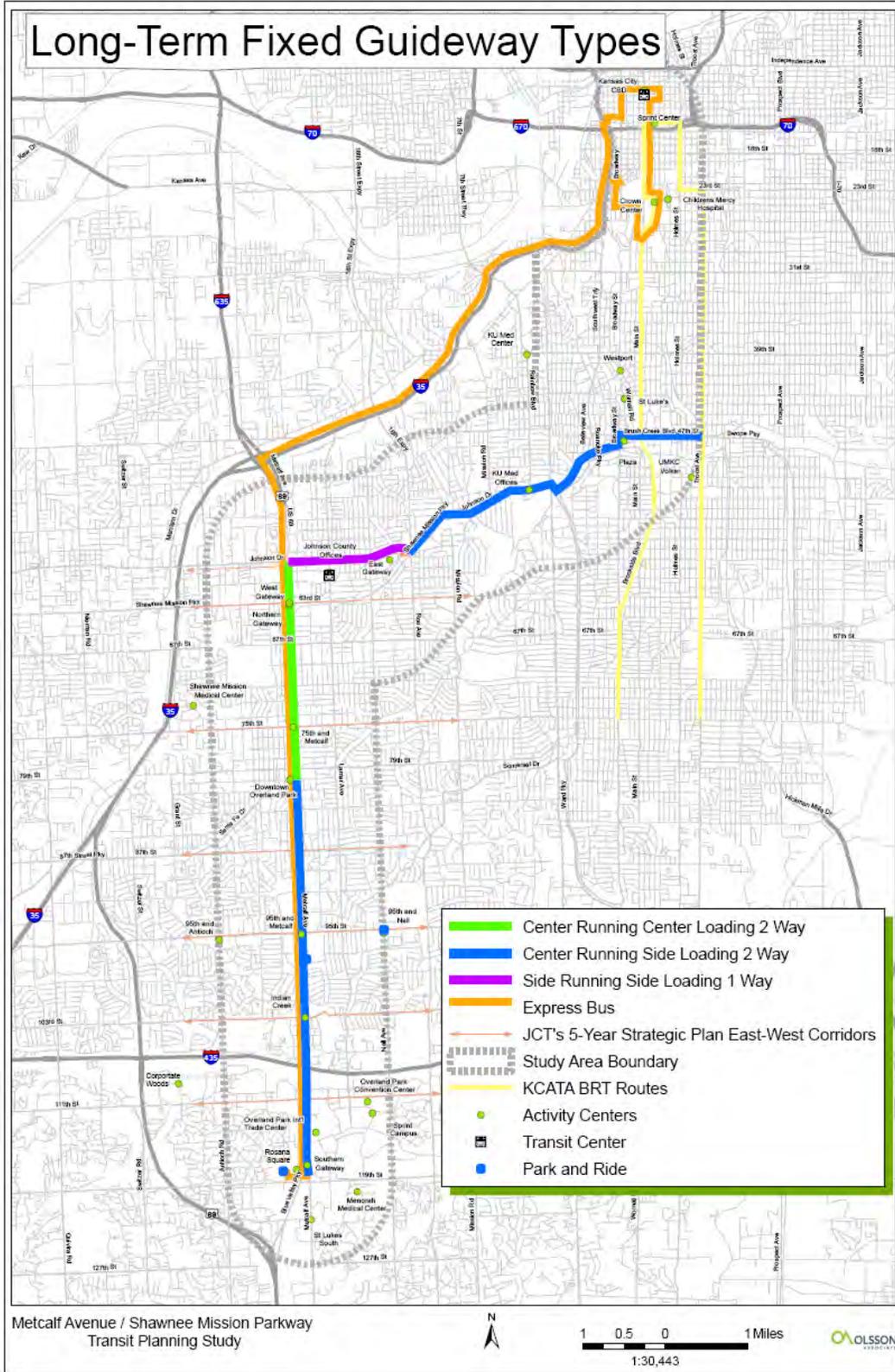
Operating Costs

The long-term phase establishes a BRT frequency of 10 minutes along the entire corridor length. Express Bus and BRT (Fixed Guideway) operating costs are determined by annual platform miles and hours of each service. All costs include direct and indirect labor costs, fuel, tires, and overhead costs. The long-term service annual operating cost is estimated at \$2.9 million for BRT (Fixed Guideway). Express bus would operate concurrently.

Capital Costs

The long-term phase will require additional vehicles. Estimates for the long-term phase rolling stock costs include 4, 40' standard low-floor coaches for the express bus service, 15 low floor, distinctive vehicles if the fixed guideway service is BRT, along with pre-delivery inspections and TSP equipment installation on each vehicle. This is five additional low floor, distinctive vehicles to those procured in the near-term phase. The total estimated rolling stock cost is \$18.3 million and is a \$5.5 million incremental increase over the near-term rolling stock costs.

Figure ES.5 Long-term Transit Concept



Transit Alternative Summary

The transit alternatives presented in this section have been developed with the screening process used in Section 6 of the study, and reflect the study’s identified goals and objectives with discussion and feedback from the Study Management team. Table ES.1 displays the comparative operations and capital costs, with estimated ridership of the near-term and long-term phases.

Table ES.1 Near and Long-term Comparison

Comparative Costs		
	Near-term BRT (Mixed Traffic)	Long-term BRT (Fixed Guideway)
Estimated Annual Ridership	342,000	1,315,350
Annual Operating Cost	\$2,025,000	\$2,924,075
Capital Costs		
Rolling Stock*	\$12,802,500	\$18,321,250
Infrastructure	\$8,172,765	\$219,800,000
Capital Total:	\$20,975,265	\$238,121,250
*Calculations are based on estimates for highly distinctive vehicles.		

Capital Funding Sources

A variety of potential sources are available to fund the near-term and long-term phases. Each funding source has distinct qualifications, requirements, and application procedures. While not all-inclusive, the following list of programs and mechanisms are typically used to fund transit capital or operation costs.

American Recovery and Reinvestment Act (ARRA)

The ARRA provides funding through the Federal Transit Administration for transit capital projects. Two new discretionary programs were created – an energy program with \$100 million in funding and a multi-modal program with \$1.5 billion in funding. One or both of these programs could be utilized to provide funding that could be used for capital expenditures related to the development of BRT service in the corridor. This funding requires no local funding match.

Federal Transit Administration Section 5307 Urban Area Formula Funding

This program provides funding to urban areas for transit capital and for transportation related planning. Planning, engineering design, capital investments such as bus replacement, bus overhaul, construction or maintenance of passenger facilities, and capital investments in new and existing fixed guideway systems, including rolling stock, vehicle overhaul, or rebuilding, track, signals, and communications, are all eligible for urban area formula funding.

The formula for urban areas of 200,000 or more is based on a combination of bus revenue vehicle miles, bus passenger miles, fixed guideway revenue vehicle miles, and fixed guideway route miles, as well as population and density. Funds are apportioned and flow directly to a locally selected recipient. In the Kansas City metropolitan area the Kansas City Area Transportation Authority is the designated recipient. Johnson County receives a sub-allocation of these funds which currently equals approximately 11% of the region's total annual formula allocation. The actual amount totals approximately \$1.3 million annually. The federal share will pay for up to 80% of the net project.

Johnson County's sub-allocation of Urban Area Formula Funding could be used for capital expenditures related to the development of BRT in the Metcalfe Avenue and Shawnee Mission Parkway corridor. This would include vehicle acquisition, station development, traffic signal priority and other technology infrastructure, and Park & Ride facilities. However, these funds are currently used for operating/capital expenses for JCT Services. Use of these funds will constitute a re-allocation of existing funding, and not a new funding stream.

Federal Transit Administration Section 5309 Capital Investment Grant Program

Bus and Bus Facilities

The Bus and Bus Related Equipment and Facilities program provides capital assistance for new and replacement buses, related equipment, and facilities. Eligible capital projects include the purchasing of buses for fleet and service expansion, bus maintenance and administrative facilities, transfer facilities, bus malls, transportation centers, intermodal terminals, Park & Ride stations, acquisition of replacement vehicles, bus rebuilds, bus preventive maintenance, passenger amenities such as passenger shelters and bus stop signs, accessory and miscellaneous equipment such as mobile radio units, supervisory vehicles, fare boxes, computers, and shop and garage equipment.

These funds are generally earmarked by congress and could be used for capital expenditures related to the development of BRT in the Metcalfe Avenue and Shawnee Mission Parkway corridor. This would include vehicle acquisition, station development, traffic signal priority and other technology infrastructure, and Park & Ride facilities.

New Starts Project Category

New Starts is the federal government's primary financial resource for supporting locally planned major transit capital investments including commuter rail, light rail, heavy rail, BRT, streetcars, and ferries. New Starts projects must emerge from a regional, multi-modal transportation planning process. This process is based upon an alternatives analysis, preliminary engineering, and final design. The FTA evaluates the project and the local financial commitment according to the following:

Mobility improvements as measured by:

- Travel time benefits
- Served low-income households
- Employment near stations

Environmental benefits as measured by:

- Change in regional pollutant emissions
- Change in regional energy consumption
- EPA air quality designation

Cost effectiveness as measured by:

- Cost per hour of travel time saved
- Operating effectiveness as measured by the system operating cost per passenger mile

Transit supportive land use and future patterns as measured by:

- Existing land use
- Transit supportive plans
- Policies
- Performance
- Impacts of policies

Optional factors such as the projected economic impact of the project can also influence a project's rating.

New Starts funding could be used for capital expenditures related to the development of a fixed guideway system in the Metcalfe Avenue and Shawnee Mission Parkway corridor where total project capital costs would exceed \$250 million. The federal share for New Starts projects is typically less than 60% of total project costs.

Small Starts Category

Small Starts projects are low cost projects that qualify for a highly simplified project evaluation and rating process by the FTA. In order to qualify as a Small Start, the total project cost must be less than \$250 million, with no greater than \$75 million in requested Section 5309 Capital Investment Grant funding, and the additional operating and maintenance expenses are less than 5% of the agency's operating budget. In addition, a project must meet one of the following guideway criteria:

1. Be a fixed guideway for at least 50% of the project length in the peak period –and/or
2. Be a corridor-based bus project with the following minimum elements:
 - Substantial transit stations
 - Signal priority/pre-emption (for Bus/LRT)
 - Low floor/level boarding vehicles
 - Special branding of service
 - Frequent service - 10 minute peak/15 minute off peak
 - Service offered at least 14 hours per day

Small Starts funding could be used for capital expenditures related to the development of a fixed-guideway BRT system in the Metcalfe Avenue and Shawnee Mission Parkway corridor, as defined in the long-term phase of the project where project capital costs total would not exceed \$250 million. Total federal funding would be capped at \$75 million.

Very Small Starts Category

Very Small Starts projects are simple, low-risk projects that qualify for a highly simplified project evaluation and rating process by the FTA. In order to qualify for the streamlined Very Small Starts evaluation and rating process, a project must be a bus, rail, or ferry project and contain the following features:

- Transit stations
- Signal priority/pre-emption (for Bus/LRT)
- Low floor/level boarding vehicles
- Special branding of service
- Frequent service - 10 minute peak/15 minute off peak
- Service offered at least 14 hours per day
- Existing corridor ridership exceeding 3,000/day
- Less than \$50 million total cost
- Less than \$3 million per mile (excluding vehicles)

Very Small Starts funding could be used for capital expenditures related to the development of a mixed-traffic BRT system in the Metcalfe Avenue and Shawnee Mission Parkway corridor where total project capital costs would not exceed \$50 million. To be eligible, existing transit usage in the corridor must be greater than 3,000 rides per day. Currently, total ridership in the corridor is less than 200 per day. Ridership increases realized from the enhanced level of transit service defined in the near-term BRT phase, coupled with route alignments that would allow the capture of existing ridership in the urban core between the Country Club Plaza and downtown Kansas City, Missouri could result in the 3,000 rides per day threshold being met, thus making the project eligible for Very Small Starts funding for the near-term phase of development. The federal share for Very Small Starts projects is 80% of total project costs.

The Congestion Mitigation and Air Quality Improvement (CMAQ) Program

The primary purpose of the Congestion Mitigation and Air Quality Improvement Program (CMAQ) is to fund projects and programs in air quality nonattainment and maintenance areas for ozone, carbon monoxide (CO), and small particulate matter (PM-10) which reduce transportation related emissions.

CMAQ funds may be used to establish new or expanded transportation projects or programs that reduce emissions, including capital investments in transportation infrastructure, congestion relief efforts, diesel engine retrofits, or other capital projects. These funds can be used for capital expenditures related to the development of BRT service in the corridor, and they would be applicable as match to any Federal capital funding awarded to the project.

State of Kansas Comprehensive Transportation Program – Transit Funding

The Kansas Urban Public Transit component of the State Comprehensive Transportation Program (CTP) provides annual funding support for transit to Johnson County. FY2010 funding will total \$1,282,715. These funds can be used for capital expenditures related to the development of BRT service in the corridor and they would be applicable as match to any Federal capital funding awarded to the project. However, these funds are currently used for operating/capital expenses for JCT Services. Use of these funds will constitute a re-allocation of existing funding, and not a new funding stream.

Transportation Development Districts (TDD)

A Transportation Development District (TDD) or Transportation Utility District is a special taxing district whereby a petitioner of 100% of the landowners in an area request either the levy of special assessments or the imposition of a sales tax of up to 1% on goods and services sold within a given area. Upon creation of a TDD by a municipality, the revenue generated by TDD special assessments or sales tax under Kansas law may pay the costs of transportation infrastructure improvements in and around the new development.

The City of Mission created a Transportation Utility District. Retailers within the district will collect an additional 1-cent sales tax for 20 years to assist in the payments for transportation improvements associated with the Gateway Project. These funds could assist in paying for specific transit projects within the designated Transportation Development District.

TDD's could be established along the corridor to generate funding for the various capital improvements associated with any and/or all phases of the BRT project. Funds generated from the TDD would be applicable as match to any Federal capital funding awarded to the project.

Community Improvement Districts (CID)

A Community Improvement District (CID) enables financing of certain projects through special assessments or a CID sales tax. Eligible projects include the acquisition, construction, refurbishing and equipping of transportation facilities, streetscaping, and landscaping. Projects can be funded with general or special obligation bonds, or on a pay-as-you-go basis

CID districts can be created in one of two ways. A city or county can create a CID without notice or a public hearing upon receiving a petition signed by all landowners in the proposed district, if financing only by assessments is requested and no general obligation bonds are to be issued.

A second petition method allows financing through special assessments and a CID sales tax, as well as general obligation bonds of the municipality. Such a petition would need to be signed by owners of more than 55% by area of land and owners collectively owning more than 55% by assessed value of the land within the proposed district.

Other

Other potential sources of Federal capital funding might include funding from various highway works administration funding programs, Housing and Urban Development programs, including Community Development Block Grants, and other Federal community investment programs. In addition, local funding from the County Assistance Road System (C.A.R.S.) program could be used.

Operating Funding Sources

The Congestion Mitigation and Air Quality Improvement (CMAQ) Program

As mentioned earlier regarding capital funding, the CMAQ program funds projects and programs that reduce transportation related emissions in air quality and nonattainment and maintenance areas. CMAQ funds may be used for new or expanded transportation projects and can be used towards the operating costs of a BRT or other high capacity mode for a maximum of three years.

Federal Transit Administration Section 5316 Job Access Reverse Commute (JARC)

JARC funding is designed to help address the unique transportation issues of low-income workers that are attracted to an increasing number of jobs located in suburban areas and away from the inner city, urban, or rural areas where low-income workers may live. These jobs often offer low-income workers non-traditional hours when transit service may be limited or non-existent. Sixty percent (60%) of JARC funding is appropriated to designated recipients in areas with populations over 200,000, and the designated recipient must select grantees competitively. In the Kansas City metropolitan area the Kansas City Area Transportation Authority is the designated recipient. Projects programmed with JARC funding must be included in a locally-developed coordinated public transit human services transportation plan. 10% of the funds may be used for planning, administration, and technical assistance.

State of Kansas Comprehensive Transportation Program -Transit Funding

The Kansas Urban Public Transit Component of the State Comprehensive Transportation Program (CTP) provides annual funding support for transit to Johnson County. These funds can be used for either capital expenditures or operational costs related to a BRT service. However, these funds are currently used for operating/capital expenses for JCT Services. Use of these funds will constitute a re-allocation of existing funding, and not a new funding stream.

Transportation Development Districts (TDD)

As mentioned earlier, a Transportation Development District is a special taxing district where 100% of the landowners request either a special assessment levy or a designated sales tax of up to 1% on goods and services sold within a specific area. The revenue generated by the special assessments or sales tax may pay the costs of transportation improvements within a given area.

TDD's similar to the one already established by the City of Mission for the Gateway Project could be established along the corridor to generate funding for the operational costs associated with any and/or all phases of the BRT project.

Farebox Revenue

Collected farebox revenue is often applied towards operational costs. The actual farebox revenue collected, when including transfers, discount riders, and bus pass sales, is typically 50% of the designated fare for local and BRT service. This percentage is lower than the farebox revenue collected for a commuter service such as the one Johnson County Transit currently primarily operates. Commuter passengers typically pay a premium for commuter service and have fewer transfers and discounted rates. A BRT system typically has higher amounts of transfers and discounted rates resulting in lower farebox revenue. Based on the forecasted ridership numbers presented in Section 7, approximately \$342,000 would be collected in the near-term phase at build-out and \$1,315,350 in the long-term phase. Table ES.2 displays each phase's forecasted annual ridership and estimated annual farebox revenue.

Table ES.2 Forecasted Daily Ridership and Estimated Farebox Revenue

Annual Farebox Revenue (at 50% of Fare)	
Near-term initial	\$259,000
Near-term build-out	\$342,000
Long-term	\$1,315,350

Next Steps

Vision Metcalf, the West Gateway Vision Plan, and the East Gateway Redevelopment Plan all call for increased transit investment along this corridor to support the increased densities called for in the future, and in many cases, cite BRT as a key factor in the development process. The *Metcalfe Avenue and Shawnee Mission Parkway Transit Planning Study* is the first step towards implementing what was previously only envisioned. Implementing increases in transit level of service through additional frequencies in BRT service will increase transit demand and set the stage for future BRT fixed guideway expansion. These transit improvements will turn Metcalf Avenue and Shawnee Mission Parkway into a major transit thoroughfare for the region

The *Metcalfe Avenue and Shawnee Mission Parkway Transit Planning Study* analyzed alternatives and determined the feasibility of implementing corridor length BRT and BRT extended service for the near-term phase. The next step is to create a project development plan that will determine the specific alignments, exact stop location, detail specific costs, specify operating characteristics, and identify funding requirements and mechanisms for the near-term phase implementation. The project development plan determines the specific service span, schedule characteristics, and vehicle assignments.

The project development plan is followed by a submittal to the FTA requesting funding approval. Design and construction is the succeeding step where any necessary right-of-

way is purchased, stations are designed and built, queue jumps are constructed, and enhancements to existing park-and-ride lots are designed and constructed. Vehicles are also procured during this step. The conclusion of these activities will be to provide improved transit service in the Metcalf Avenue and Shawnee Mission Parkway corridors.