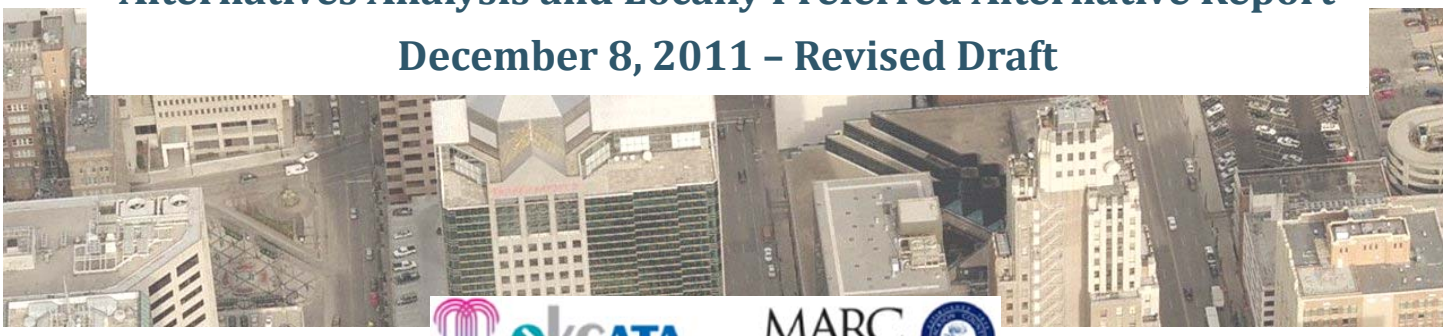
Regional Alternatives Analysis: Downtown Corridor

Alternatives Analysis and Locally Preferred Alternative Report

December 8, 2011 – Revised Draft



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1. Background

1.1 Introduction and Purpose of the Study

This Alternatives Analysis (AA) and Locally Preferred Alternatives (LPA) Report presents the documentation of the development of alternatives, evaluation of alternatives and selection of the preferred alternative by the City of Kansas City and its local agency partners for the *Regional Alternatives Analysis: Downtown Corridor* study in the Kansas City metropolitan area.

This downtown corridor AA is one of a series of efforts that have been undertaken to examine rail service in the downtown corridor. For several years, a variety of studies by a group of local agencies has examined a variety of transit options that would serve the city's primary commercial core. The purpose of this study was to develop, evaluate and select a transit alternative in Kansas City's downtown corridor. The reasons for examining enhanced transit alternatives include:

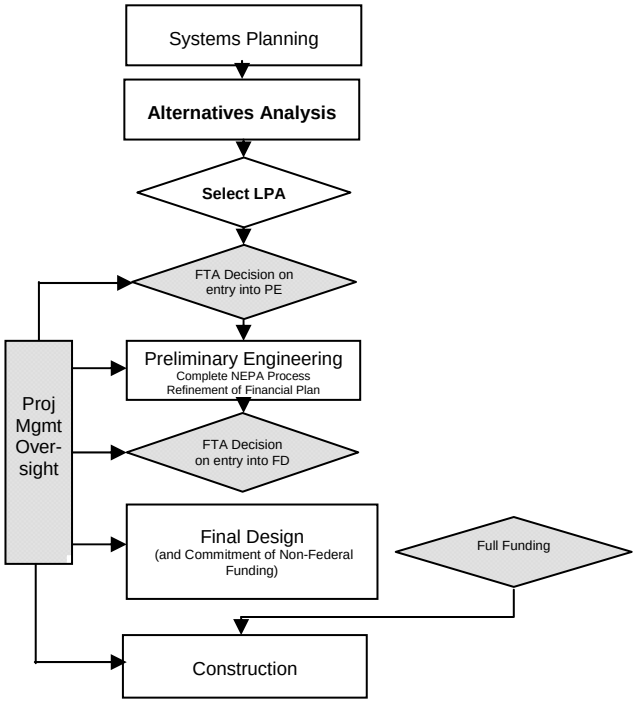
- To increase mobility between River Market, downtown, Crossroads and Crown Center
- Tie neighborhoods together; serve the residential populations
- Serve as a distributor for transit passengers
- Potentially serve as a first step in the development of a more extensive light rail system in the corridor

The current study was led by a partnership of local and regional agencies, including:

- City of Kansas City, Missouri,
- Kansas City Area Transportation Authority (KCATA)
- Mid-America Regional Council (MARC), and
- Jackson County, Missouri.

The partner agencies have undertaken this Alternatives Analysis in cooperation with the Federal Transit Administration (FTA). The study was designed to comply with the FTA's planning and project development process. The major steps of the FTA process are shown in Figure 1-1: FTA's Federal Transit Planning and Project Development Process, as shown to the right. Within the larger Project Development Process, the two key steps that have been addressed in this study are the Alternatives Analysis process and selection of the Locally Preferred Alternative (LPA).

Figure 1-1: FTA's Federal Transit Planning and Project Development Process



The study team has consulted with FTA during the AA study. The study team will continue to work with FTA to move the project forward. There is much work yet to be done, including local planning compliance,

compliance with NEPA, and other federal, state and local requirements. The partnership team will continue to work with FTA to complete the Project Development Process, including addressing the requirements of the National Environmental Policy Act (NEPA) and all local planning and regulatory requirements.

1.2 Background

Kansas City has examined a variety of planning and transportation options to support the revitalization of the downtown. Like many US cities, downtown Kansas City has experienced dis-investment and urban flight. It has experienced loss of both residents and businesses in the city's primary core area. This downtown corridor alternatives analysis study began in earnest in early 2011. The process has included extensive outreach to the public and stakeholders and has received substantial input from the public, stakeholders (e.g., residents, business owners, etc.) and local, regional, state and federal agencies.

The Kansas City area has an extensive existing transit system provided by the Kansas City Area Transportation Authority (ATA). KCATA is a bi-state agency serving the States of Missouri and Kansas with the responsibility for planning, construction, owning and operating passenger transportation systems and facilities within the seven-county Kansas City metropolitan area. The ATA district includes the counties of Cass, Clay, Jackson, and Platte in Missouri; and Johnson, Leavenworth, and Wyandotte in Kansas. The ATA operates The Metro bus service, the Metro Area Express http://www.kcata.org/maps_schedules/max/ (MAX) Bus Rapid Transit service, MetroFlex demand-response routes, Share-A-Fare paratransit service for the elderly and persons with disabilities, and AdVANtage vanpool service.

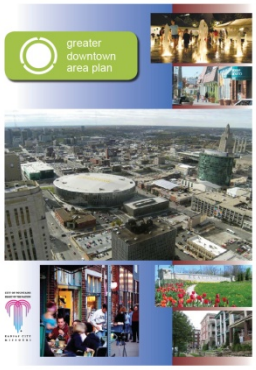
Over more than a decade, there have been a number of transit planning efforts that have examined transit alternatives in Kansas City. All of them have had a major focus on serving the downtown area. Some of the key previous studies include:

- **Kansas City Downtown Streetcar Update & TIGER Grant Application, 2009** (and associated supporting reports). Building on the previous studies, an application for TIGER grant funding was prepared by KCATA. The grant request was developed and submitted to FTA for $6 million to fund continued development of a Streetcar Project in the downtown area. The application was not funded.
- **North/South Corridor Alternatives Analysis, 2008.** (and associated technical reports) This Alternatives Analysis studied light rail in Kansas City's central North/South Corridor. It concluded that the portion of the alignment between the River Market and the Country Club Plaza has the greatest chance of qualifying for federal funding because this segment has the activity centers and the population and employment density required to support an investment in rail transit.
- **Light Rail Study, 2007-2009**. In November 2006, the voters of Kansas City, Missouri approved a citizen-initiated ballot initiative to fund a 27-mile light rail transit project from the airport, through downtown to the zoo. The KCATA and the City of Kansas City collaborated on an AA for Phase 1 of the project, which raised a number of concerns about the proposed project. The evaluation concluded that the light rail initiative had major deficiencies, and in November 2007 the Kansas City Council voted to repeal the referendum because of concerns regarding the feasibility and costs.
- **Streetcar Feasibility Study, 2004.** This study was the first to propose the idea of reintroducing Streetcars to downtown Kansas City as a means to connect the City's downtown landscape of

businesses and entertainment districts; linking the River Market, The Central Business District (CBD) and the Union Station / Crown Center area. The intent of this study was to review electric streetcar options for the downtown area and develop a primary concept plan with order-of-magnitude cost estimates for an initial starter line.

The work plan for the downtown corridor AA was designed so that the partner agencies could keep options open to pursue various funding opportunities, including existing and potential Federal funding options for the selected project.

There is strong public policy support for developing a multimodal transportation investment in downtown Kansas City. It will be critical for economic growth and the development of a sustainable future. There are a large number of adopted regional and local policies that provide support for an improved transit circulation in the downtown corridor. Key adopted plan and policy initiatives include:



Greater Downtown Area Plan (City of Kansas City, MO) presents a vision for the greater Kansas City downtown area designed to improve quality of life in the region's core, protect precious natural capital, and strengthen economic vitality to competitively position downtown as the region's cultural, economic, and activity center. The plan explicitly reinforces and embraces dense, mixed-use development in the Central Business Corridor – maintaining downtown as the densest area of the region, a regional office/employment center, the center of government, the most important cultural destination, the center of entertainment/convention/tourism activity, and a significant retail destination. The plan recommends a transit corridor with rail down Main Street or Grand Boulevard. It also recommends some type of trolley circulator in the downtown area. The plan also calls for increased connectivity between neighborhoods and activity centers, focused on mixed-use activity centers to serve as nodes for the transit system. Transit-Oriented Development is encouraged.

Smart Moves (MARC) presents the Kansas City region's vision for expanded and enhanced regional transit service. Kansas City Area Transportation Authority (ATA) or KCATA is a bi-state agency with the responsibility for planning, constructing and operating passenger transportation systems and facilities within the seven-county Kansas City metropolitan area. The ATA operates The Metro bus service, the Metro Area Express http://www.kcata.org/maps_schedules/max/ (MAX) Bus Rapid Transit service, MetroFlex demand-response routes, Share-A-Fare paratransit service for the elderly and persons with disabilities, and AdVANtage vanpool service. The existing local and regional transit services will need to be supported by effective local transit circulator services, especially in the downtown corridor. The Smart Moves plan explicitly recognizes that transit service in key corridors needs to evolve to more intensive operational modes, such as bus rapid transit (BRT) and rail transit, as development intensifies over time.

KCATA Comprehensive Service Analysis (KCATA) designed to develop short-term transit improvements to existing Metro services. Work to date has determined that service in downtown Kansas City is overly complex, and that the development of a downtown – Crown Center "spine" would provide the foundation for simpler and more efficient service with downtown and in the downtown corridor.

Transportation Outlook 2040 (MARC) is the Kansas City Region's long-range transportation plan guiding how the Kansas City region will manage, operate and invest $18 billion in its multimodal transportation system over the next 30 years. It is designed to help the region grow more efficiently, maintain a competitive economy and preserve the health of the environment, while enabling everyone to access opportunity. The plan lists "Place Making" as one of its nine system goals driving policy, with such objectives as walkability, density/mixed uses, transportation options, and infill/redevelopment.

Climate Protection Plan (City of Kansas City, MO) lays out goals for the City of Kansas City to reduce its greenhouse gas emissions while simultaneously improving the economy and quality of life for the City's businesses and citizens. Several of the plan's recommendations are in harmony with the goals of the downtown corridor alternatives analysis, including the following:

- expand and further develop alternative transportation programs,
- develop a plan to implement light rail as part of a healthy overall public transit system,
- promote and incentivize development patterns that support alternative modes of transportation and avoid sprawl,
- reduce emissions by reducing net vehicle-miles traveled,
- enact a "complete streets" policy, and
- create a seamless regional transit system.

Rail-based transit has also been envisioned in transportation plans, land-use plans and previous studies for the downtown corridor. Downtown voters have consistently supported rail transit; for example, although the November 2008 light-rail ballot failed citywide with only 45 percent of voters in support, 64 percent of the voters of Ward 1 (most of the downtown area) voted in support. In addition, an Alternatives Analysis is being undertaken concurrently to evaluate potential commuter rail service between the eastern suburbs and downtown Kansas City. Such service would likely intersect with, and be complementary to, a downtown circulator.

1.3 Corridor Study Area

The Corridor Study Area encompasses the Central Business District of Kansas City Missouri. The Corridor extends from the River Market area on the north, through the Central Business District and the Crossroads areas to Crown Center on the South. Figure 1-2 on the next page illustrates the study area, and the photograph on the following page shows the general the area of downtown Kansas City that is included in the study area. More detailed information on the Study Area is in included in Chapter 3, the Description of Alternatives.

**Figure 1-2: Regional Alternatives Analysis:
Downtown Corridor Study Area**

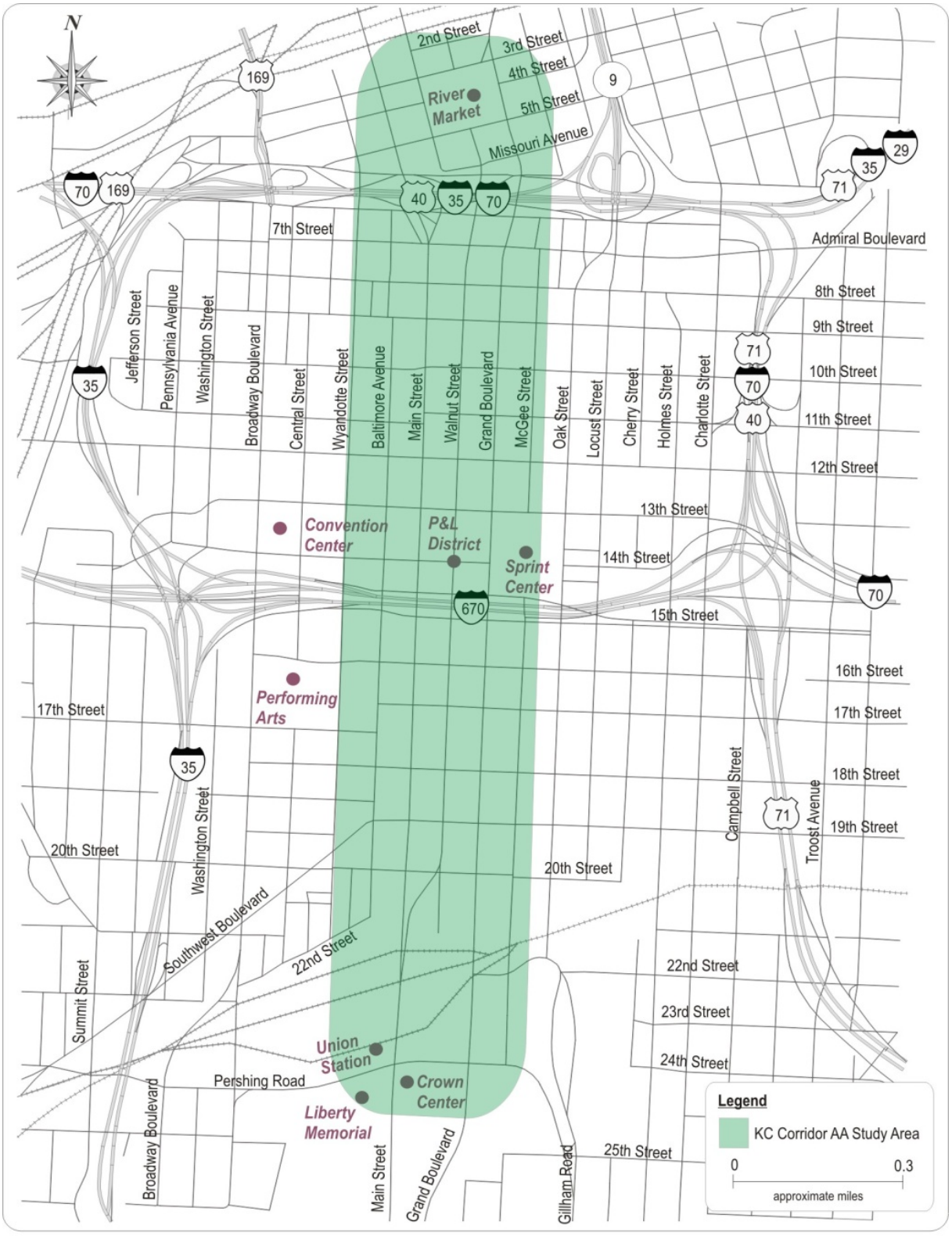


Figure 1-3: Regional Alternatives Analysis: Downtown Corridor Study Area

1.4 Study Organization

As noted in the introduction section, this Downtown Corridor Alternatives Analysis study is a cooperative effort between several partner agencies, including:

- City of Kansas City, Missouri,
- Kansas City Area Transportation Authority (KCATA)
- Mid-America Regional Council (MARC), and
- Jackson County, Missouri

This partnership has undertaken the Alternatives Analysis to examine enhanced transit solutions in Kansas City's downtown Corridor.

Early in the AA study, the leadership team was formed to manage the study. The leadership team is made up of a senior staff member from each of the partner agencies. The leadership team served as the

project Executive Committee and provided day-to-day direction to the project staff and consultants. The leadership team formulated recommendations to the partner agencies.

The Kansas City Parking and Transportation Committee made the initial Locally Preferred Alternative recommendation. After hearing from Stakeholders and the public, the Parking and Transportation Committee made their recommendation to the Kansas City City Council. After hearing from the public and stakeholders, the City Council adopted the locally preferred alternative. The Board of Directors for KCATA and MARC endorsed the LPA in December 2011. The Regional Transportation Plan is expected to be updated to reflect the LPA decision in January 2012.

2. Purpose and Need

2.1 Introduction

A critical part of every Alternatives Analysis process is the development of the Purpose and Need Statement. Fundamental to the Purpose and Need Statement is a thoughtful process of defining what problem(s) the study is attempting to resolve. Also critical to the development of the Purpose and Need Statement is the articulation of the Goals and Objectives of the study. The Purpose and Need Statement is used to define a series of promising alternatives, and further to guide the development of evaluation criteria for evaluating the alternatives. The development of the Purpose and Need Statement has drawn strongly from previous studies in the area. The purpose of this chapter is to document these critical steps in the *Regional Alternatives Analysis: Downtown Corridor Study*.

Figure 2-1: FTA Alternatives Analysis Process

Early in the study, the project partners developed draft Goals and Objectives, and a draft Purpose and Need Statement. The draft was presented to the public at an open house and after revisions based on the public input, adopted by the partnership team for the study.

2.2 Corridor Problems

The *Regional Alternatives Analysis: Downtown Corridor Study* was initiated to address a number of transportation and land use issues, challenges, problems and opportunities in the downtown area. These issues, challenges, probems and opportunities are described below and provide the foundation for the Goals and Objectives, and Purpose and Need Statements, which are presented in detail following this section.

2.2.1 Land Use and Transportation Plan and Policy Context

Regional and local plans and policies support improved transit circulation in the downtown corridor. Key plan and policy initiatives include:

- **Smart Moves – MARC.** This Regional plan assumes that transit service in key corridors will evolve to more intensive operation modes, such as bus rapid transit (BRT) and rail transit, as land uses intensify over time.
- **2011 Comprehensive Service Analysis (CSA).** KCATA is in the process of conducting a transit service planning effort. The current version emphasizes the need for a downtown circulation plan, distinguishes between service to downtown and service within downtown, sets service design guidelines, and otherwise configures the transit system for optimal function with available resources.
- **Greater Downtown Area Plan (GDAP) – Kansas City, MO.** This plan explicitly reinforces and embraces dense, mixed-use development in the Central Business Corridor – maintaining downtown as the densest area of the region, a regional office/employment center, the center of government, the most important cultural destination, the center of entertainment, convention, tourism activity,

and a significant retail destination. The plan recommended a transit corridor with rail down Main Street or Grand Boulevard. It also recommended some type of trolley circulator in the downtown area. The plan also calls for increased connectivity between neighborhoods and activity centers, focused on mixed-use activity centers to serve as nodes for the transit system. Transit-Oriented Development is encouraged. Finally, the plan listed walkability as the first of its five overarching goals.

- **Transportation Outlook 2040 – MARC.** This regional long-range transportation plan has a policy agenda that is centered on the idea of activity centers and corridors - strategically concentrating growth and development. The plan lists "Place Making" as one of its nine system goals driving policy, with such objectives as walkability, density/mixed uses, transportation options, and infill/redevelopment.
- **Fixed Guideway Transit Alternatives Analysis** – A separate Alternatives Analysis is being undertaken concurrently to evaluate potential commuter rail service between the eastern suburbs and downtown Kansas City. Such service is expected to intersect with, and be complementary to, a downtown circulator.

2.2.2 Transportation

In downtown Kansas City, there are limited linkages between activity centers. The need is to improve transportation options for local circulation. Transportation and transit issues include:

- **Transit Circulator.** There is poor connectivity between downtown activity nodes (River Market, downtown, Crossroads, and Crown Center). Currently, these major destinations are geographically isolated. The MAX BRT System brings people into downtown, but provides limited downtown circulation and is not easily understood by visitors and non-regular transit users in the downtown area. The existing transit system does not adequately support downtown activities (such as "First Fridays", Sprint Center events, and other events throughout the downtown) with more robust non-automobile options.
- **Complete Transit System.** There is a need to further the goals of transit system integration; complement the existing bus and MAX systems; provide "last mile" connectivity; provide distribution for future commuter rail; provide circulation for visitor and convention attendees; and reduce the need for short auto trips in the downtown area.
- **Improve the Pedestrian Environment and Accessibility**. Increased walkability and pedestrian activity is a key goal in the downtown area. Additional transportation options need be developed that would encourage more walking throughout the study area.
- **Parking.** There is a need to better utilize existing parking by connecting available parking with activity centers and areas with a shortage of parking. Better local transit circulation could connect older buildings (without off-street parking) with available parking in surrounding areas.
- **Future Congestion.** Auto-based congestion will increase with the planned residential and employment growth. However, auto capacity improvements involving new right-of-way are impractical due to physical constraints and would be counter-productive to the downtown goals.
- **Access to Parks and Recreation Facilities.** Park resources are concentrated at the ends of the downtown corridor. The Riverfront Heritage trail is currently difficult to access because it is somewhat isolated and disconnected from the more active parts of the downtown area. A new riverfront redevelopment plan is underway that seeks to expand activity in this area, and as new

residential projects re-fill the downtown core, residents would obtain access to these parks via the circulator.

2.2.3 Land Use and Economic Development

Employment and housing have declined in downtown Kansas City for many years. This trend has been exacerbated recently by significant incentives being offered by the State of Kansas to businesses, incentivizing many business to move out of downtown Kansas City, Missouri. Meanwhile, the region's policy initiatives are focused on supporting reinvestment, revitalization and a high-quality pedestrian environment in the downtown corridor study area. Land use and economic issues include:

- **Downtown Activity Centers.** Downtown Kansas City is the home of numerous regional activity centers. As the core of the region, it is the logical and established cultural and civic center. Recent developments (Sprint Center, Power and Light District, Performing Arts Center, etc.) have reinforced downtown's regional prominence and initiated a resurgence in vitality. Ongoing, visionary investments are needed to sustain this resurgence.
- **Development and Redevelopment.** The *Greater Downtown Area Plan* and other downtown planning initiatives encourage better utilization of underutilized parcels and surface parking lots, support re-filling empty storefronts and vacant office space, and encourage Transit-Oriented Development.
- **Housing.** GDAP's goal is to double the downtown population, which will require building more housing, including replacing housing that has been lost.
- **Catalyst for Redevelopment.** Public infrastructure investments are needed as a catalyst for development and redevelopment of vacant and underutilized parcels. Although transit investments such as the MAX BRT system have improved downtown transportation options, non-fixed-guideway transit is not known to serve as a major catalyst for redevelopment.
- **Keeping Businesses Downtown.** Downtown Kansas City needs to retain, expand and attract businesses. The market advantages of downtown need to be improved in order to minimize or reduce existing business departures, as well as attract new businesses.
- **Serving Transit-Dependent Populations.** As housing increases in downtown, transit-dependent populations (including the elderly and those with disabilities) will locate close to accessible transportation if it is available. Provision of an accessible downtown transit system with level-boarding service would attract elderly and transit-dependent populations to the central area.

2.3 Goals and Objectives

The goals identified for the study are consistent with the Kansas City region's vision for the future, and form the basis for the Purpose and Need Statement for the Alternatives Analysis study. Each goal has a related list of objectives. The objectives provide guidance for attaining each goal, represent successive levels of achievement in movement toward the goal, and reflect the expected results achieved during the planning horizon for the project. The goals and objectives are the foundation for the project's Purpose and Need Statement and Evaluation Criteria.

2.3.1 Goal 1: CONNECT – Enhance Linkages in Downtown Kansas City and Improve Local Circulation

Objectives:

- Provide more focused and easily-accessed transit options within and between downtown and Crown Center.
- Connect key activity centers and population centers.
- Develop a transit spine around which existing transit services can be more effectively organized.
- Expand transit choices and improve local circulation to attract new riders.
- Serve as an initial "building block" in the region's desired rail transit system.
- Enhance mobility throughout the corridor; integrate with other elements of the existing transportation system (e.g., transit, automobile, pedestrian, bicycle).
- Facilitate car-free travel by residents, employees, and visitors, including convention attendees.
- Provide effective connections to planned/future commuter rail service.
- Support future system expansion to other neighborhoods.
- Develop an initial system with a capital cost and annual operating cost that are financially sustainable.
- Encourage support (conceptual, political, and financial) for transportation solutions from property owners near the route, including institutions, businesses, and developers.
- Facilitate the development of complete streets and a better pedestrian environment.
- Recognize the expressed intent of voters in the downtown area to build a rail system that serves the downtown corridor.

2.3.2 Goal 2: DEVELOP – Support Local and Regional Economic Development Goals

Objectives:

- Support existing employment centers in downtown, Crossroads, and the Crown Center/Union Station areas.
- Support existing residential development centers in the River Market, Crossroads and the Crown Center/Union Station areas.
- Spur new development throughout the corridor.
- Encourage higher-density, mixed-use land use patterns consistent with local and regional plans and to better support transit.
- Convert surface parking to transit-oriented mixed-use development.
- Reduce the amount of parking that will be associated with new development.

- Minimize impacts of future congestion due to new development and redevelopment in the downtown area.
- Refill empty office buildings.

2.3.3 Goal 3: THRIVE – Strengthen Downtown Districts and Urban Centers

Objectives:

- Enhance quality of life and access to corridor destinations for residents, employees and visitors to the downtown area.
- Support the strength and character of existing neighborhoods; provide access to cultural facilities, retail, parks, and entertainment venues.
- Enhance access to, and the vitality of existing activity centers.
- Support convention, cultural, and special event activities.
- Support the development of new activity centers in the corridor.
- Increase the safety and security of the transportation system for transit users, vehicles, bicyclists and pedestrians.

2.3.4 Goal 4: SUSTAIN – Create an Environment that will be Sustainable Over Time

Objectives:

- Preserve the historic character of the downtown area by supporting the re-use of vacant and under-utilized historic buildings and promote appropriately scaled infill development.
- Provide more environmentally friendly transportation options.
- Reduce the amount of space devoted to parking.
- Reinforce a pattern of development that creates fewer greenhouse gas emissions through higher residential densities and lower per capita vehicle miles traveled.

2.4 Purpose and Need

2.4.1 Statement of Purpose

For much of the last 20-plus years, Kansas City's core, although it remained the most important economic engine of the region, has declined as more business and residents have moved to newly developing areas surrounding the core, or elsewhere in the region. A major emphasis of many regional efforts is to revitalize and grow the core, and improved transit within the Downtown corridor must be an essential part of these efforts. The purpose of the project is to provide an attractive transit option that will more conveniently connect people and places within the Downtown Corridor, and support regional and city efforts to develop downtown Kansas City and the Downtown Corridor as a more attractive and successful urban center.

2.4.2 Statement of Need

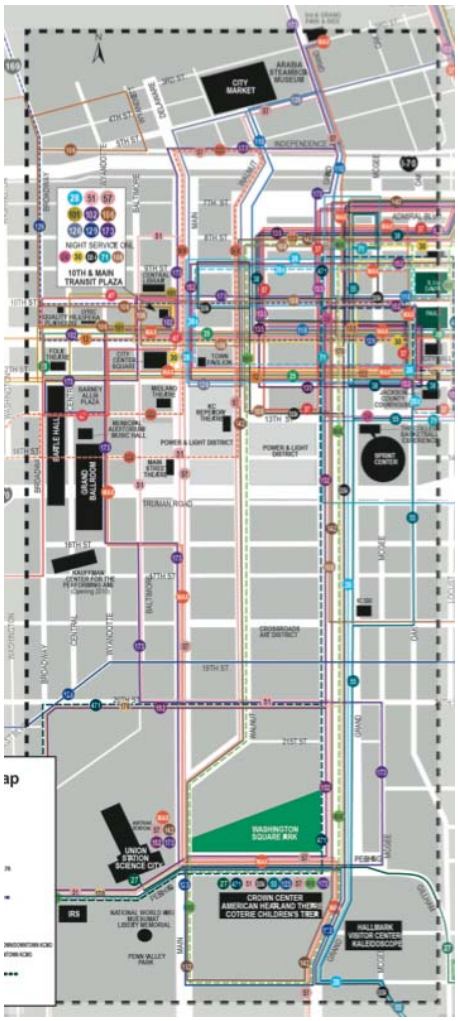
The need for this project is best expressed through four themes related to mobility and connectivity, economic development and growth, community and livability, and sustainability. This project is needed to help the downtown corridor **connect**, **develop**, **thrive**, and **sustain**.

CONNECT: Enhance Linkages in Downtown Kansas City and Improve Local Circulation

In downtown Kansas City, there is a need for enhanced linkages between activity centers to improve transportation options for local circulation. Transportation and transit issues include:

- **Improve Circulation within the Downtown Corridor.** The downtown corridor includes a number of activity centers–River Market, downtown, Crossroads, and Crown Center–that are geographically isolated. The existing transit system is configured to connect core areas with the larger region; the downtown portions of these radial routes do not function well as local circulators. In particular, the Main Street MAX BRT line serves the corridor, but is designed primarily to connect the Main Street corridor south of Crown Center with Crown Center and downtown, rather than provide circulation within the corridor. A major function of downtown corridor circulator service would be to serve trips within the corridor, including by visitors and attendees at special events such as First Fridays, Sprint Center events, and conventions.
- **Connect Downtown Activity Centers.** Downtown Kansas City is the home of numerous regional activity centers. As the core of the region, it is the logical and established cultural and civic center. Recent developments (Sprint Center, Power and Light District, Performing Arts Center, etc.) have reinforced downtown's regional prominence and have initiated a resurgence in the study area's vitality. Ongoing, complementary transit investments that serve the particular mobility needs of this urban community are needed to sustain this resurgence.
- **Enhance and Integrate Multimodal Transportation Options.** There is a need to further the goals of transit system integration, complement the existing bus and MAX systems, provide "last mile" connectivity for regional transit trips, provide distribution for future commuter rail, provide circulation for visitor and convention attendees, and, reduce the need for short auto trips in the downtown area.

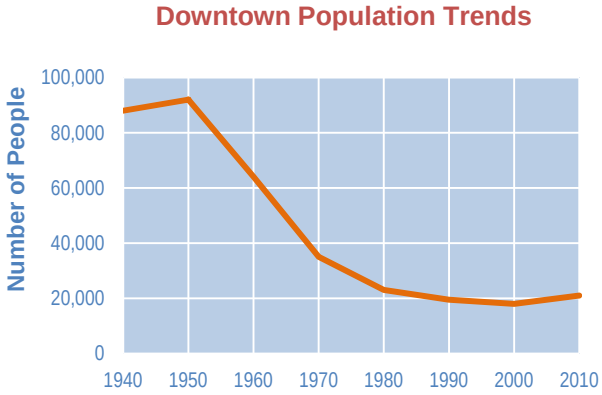
Figure 2-2: Complexity of Existing Downtown Transit Service



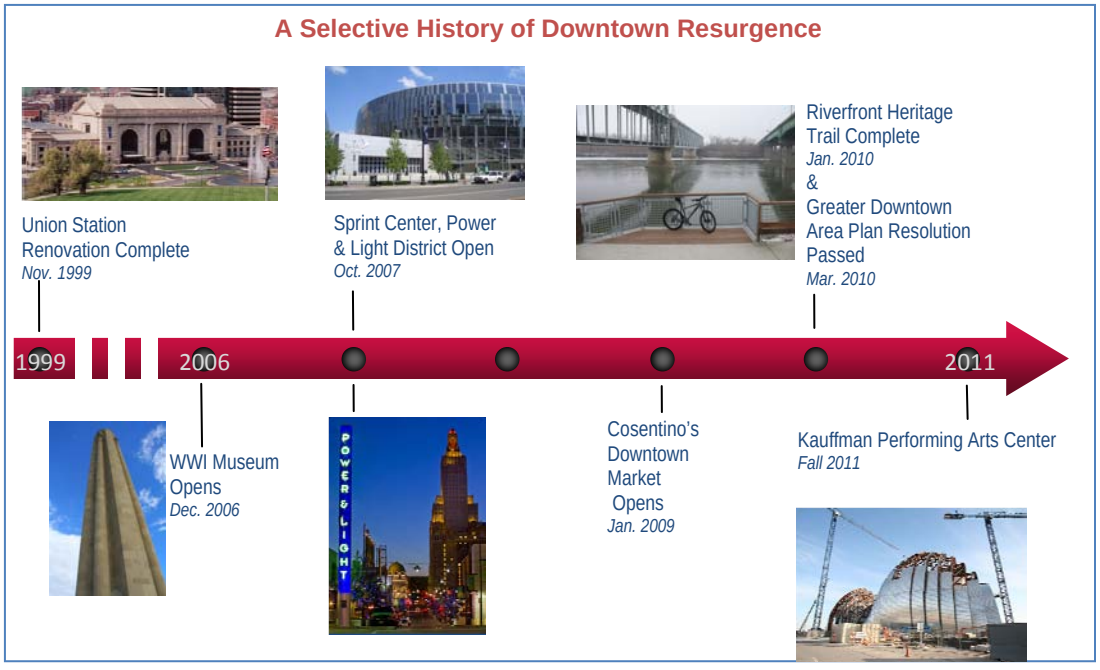
- **Improve Effectiveness and Efficiency of Existing Transit Services.** Service in downtown is overly complex (see Figure 2-2), and downtown corridor service could provide the spine for an overall restructuring of downtown and corridor services. An effective and easily understood downtown circulator route could improve the usability of the larger transit system.

- **Improve the Pedestrian Environment and Accessibility.** Increased walkability and pedestrian activity is a key goal in the downtown area. Even relatively short trips along this corridor are now often taken by automobile. Additional transportation options need to be developed that would encourage more walking throughout the study area.
- **Access to Parks and Recreation Facilities.** Park resources are generally concentrated at the ends of the downtown corridor. The Riverfront Heritage trail is currently difficult to access because it is somewhat isolated and disconnected from the more active parts of the downtown area. A new riverfront redevelopment plan is underway that seeks to expand activity in this area, and as new residential projects re-fill the downtown core, residents will need access to these parks.

DEVELOP: Support Local and Regional Economic Development Goals



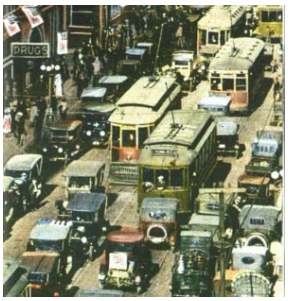
Employment and housing has steadily declined in downtown Kansas City for decades, from a high of over 90,000 residents in the 1950s to under 20,000 in 2000. Still, the downtown corridor remains home to the greatest concentration of transportation, employment, medical, educational, visitor and cultural facilities in the Kansas City metro area, and the corridor's economic health and vitality are important to the entire metro area. The past decade has seen major investments begin to transform (and restore) the downtown area into an attractive and vibrant destination (see graphic below). These significant investments need to be coupled with the return of residents and services to the downtown area. In recent years, housing stock and population in the downtown corridor have increased (2010 population was 22,576) even while the City as a whole has experienced decreases.



However, the ability for these positive trends to continue is hampered by excessive dependence on automobile travel with resulting issues of parking supply and policies (described more fully below). Much of the redevelopment to date could be described as "urban, but automobile-dependent." Continuation of redevelopment with high automobile mode usage will be counterproductive. In addition, recent significant incentives offered by the State of Kansas have caused some key businesses to move out of the downtown and across the state line, undermining some of the progress that has been made. Meanwhile, the region's policy initiatives are focused on supporting reinvestment, revitalization and a high-quality pedestrian environment in the study area. An integrated transit system in the urban core will improve mobility, economic development and community livability from both the local and regional perspectives, serving the people who live, work, and visit here, and reinforcing the positive trends now beginning to reverse previous decline.

Land use and economic issues in the corridor include:

- **Encourage Development and Redevelopment.** The *Greater Downtown Area Plan* and other downtown planning initiatives encourage better utilization of underutilized parcels and surface parking lots, support re-filling empty storefronts and vacant office space, and encourage Transit-Oriented Development.
- **Provide Catalyst for Redevelopment.** Public infrastructure investments are needed as a catalyst for development and redevelopment of vacant and underutilized parcels. Although transit investments such as the MAX BRT system have improved downtown transportation options, fixed-guideway transit has been shown to also serve as a catalyst for redevelopment, which traditional bus transit generally cannot accomplish.
- **Increase Number of Downtown Residents.** The *Greater Downtown Area Plan*'s goal is to double the downtown population, which will require building more housing as well as replacing housing that has been lost.
- **Support Downtown's Historical Urban Fabric and Form.** Downtown Kansas City was built around a vibrant streetcar system. From the late 1890s to the mid 1940s, with peak annual ridership of 136 million in 1922, streetcars were the predominant mode of transportation, and literally shaped the downtown's urban form. Hence, much of the downtown area was laid out with streetcar-based transportation in mind, and is "under-parked" for access by automobile, and transportation options should support and respect this pattern of urbanism.



Walnut Street in the late 1910s

- **Support Transit-Oriented Development/ Minimize the Need for Parking.** Parking policies in downtown Kansas City do not currently support the residential/employment density envisioned by future plans. Currently, new development must be accompanied by parking ratios that reflect an automobile-dominated transportation system. Transit planning in the downtown area needs to be better integrated with parking policy to result in more efficient use of land and recognition of walking and transit as primary transportation modes downtown. As the Study Area develops and redevelops, improved downtown corridor transit service can significantly reduce the need for additional parking and attendant automobile traffic and traffic congestion increases.

THRIVE: Strengthen Downtown Districts and Urban Centers

- **Strengthen Downtown Districts and Urban Centers.** The downtown corridor comprises a "string" of distinct districts or centers. Each has a unique character; each is only partially realized since significant redevelopment opportunities remain in each as well:
  - The Crown Center/Union Station area contains a mixture of major regional institutions and attractions, including Union Station, the World War I Museum, Penn Valley Park, the existing Crown Center and major additions to it now under development including the Sea Life Aquarium and Legoland Discovery Center, as well as a small amount of housing.
  - The Crossroads District is a very urban, but lower-scale mixed use neighborhood, with a lively mixture of art galleries and arts-related businesses, housing, restaurants and small employers.
  - The Sprint Center/Power & Light District is a major attractor, with large and small civic and cultural facilities and community gathering places, as well as restaurants, retail and entertainment businesses.
  - The downtown core is, as noted above, the historic center of office employment for the region for both the private and public sectors.
  - The River Market district is both an urban residential neighborhood and the venue for the region's largest public market, with additional attractions and smaller businesses in the mix as well.
- **Support Existing Businesses.** The development of a stronger downtown corridor will increase business activity, which will increase business for existing enterprises, encourage existing businesses to stay, and attract new business.
- **Provide Additional Services for Residents.** At present, because there are now relatively few residents in the corridor, there are also relatively few services aimed at residents. The development of a stronger downtown corridor that attracts more residents will also attract new services for existing and added residents.
- **Support Visitor and Tourism Activities.** Most of the region's convention and tourism assets are in the Study Area. Kansas City's existing public transit system is designed around employment, and additional mobility options are needed to connect convention facilities, entertainment venues and hotels, which otherwise require short auto/taxi trips.

Bartle Hall Convention Center

- **Avoid Future Congestion.** Auto-based congestion will increase with the planned residential and employment growth, if it is developed with parking ratios typical for "urban, but automobile-dependent" development. However, auto-based capacity improvements involving new right-of-way are impractical due to physical constraints and would be counter-productive to the downtown goals.
- **Serve Transit-Dependent Populations.** As housing increases in downtown, transit-dependent populations (including the elderly and those with disabilities) will locate close to accessible transportation if it is available. Provision of an accessible downtown transit system with level-boarding service would attract elderly and transit-dependent populations to the central area.

SUSTAIN: Create an Environment that will be Sustainable Over Time.

Downtown planning points to a need to create an environment that will promote long-term sustainable development, with development patterns that are less automobile-oriented and support environmental goals. Achieving a more transit-oriented pattern of development as redevelopment occurs will significantly reduce per capita vehicle miles traveled, the most significant contributor to greenhouse gas emissions.

2.5 Evaluation Criteria

The evaluation process for this AA study included two levels of screening of alternatives. Tier 1 examined a variety of north-south alignments in downtown Kansas City to determine which alignments could best serve the transit needs, but was mode-neutral. The Tier 2 screening examined mode (bus and rail) and alignment (on Main Street and Grand Boulevard) alternatives (the most promising alignments resulting from the Tier 1 screening).

Both the Tier 1 and the Tier 2 evaluation criteria were developed from the Purpose and Need Statement and the supporting Goals and Objectives. These were all organized around four themes and project goals that included:

- **Connect**: Enhance linkages in downtown Kansas City and improve local circulation
- **Develop**: Support local and regional economic development goals
- **Thrive**: Strengthen downtown districts and urban centers
- **Sustain**: Create an environment that will be sustainable over the long term

The Purpose and Need Statement includes a series of objectives related to each project goal. These objectives guided the development of a series of evaluation criteria that were used in both the Tier 1 and Tier 2 evaluation processes. The criteria further defined each objective and support evaluation of the alignments and alternatives against the stated goals in a transparent and understandable manner. These evaluation criteria, grouped by study goal, are listed in Table 2-1, on the following page.

Table 2–1: Kansas City Downtown Corridor Evaluation Criteria
for Tier 1 and Tier 2 Evaluation of Alternatives

CONNECT: Enhance Linkages in Downtown Kansas City and Improve Local Circulation		
Objective	**Evaluation Criteria**	**Presentation**
• Improve circulation within the downtown Corridor • Improve transportation options	• Ability to provide "last mile connectivity" • Connections with existing transit system • Potential connections to future services (regional rail)	Tier 1 • Discussion of connections with other existing transit services • Discussion of intermodal connections • Discussion of potential connections with future services such as regional rail
• Improve connections between existing downtown activity centers	• Number of activity centers served • Quality of transit connections between activity centers and alignment	Tier 1 • Number of activity centers within ¼ mile of proposed alignment and stations Tier 2 • Number of activity centers within ¼ mile of proposed alignment and stations • Walking times to/from major activity centers
• Improve pedestrian and bicycle environment	• Quality of pedestrian and bicycle connections • Potential for improvements to pedestrian and bicycle infrastructure	Tier 1 • Current primary road configuration • Discussion of quality of bicycle and pedestrian connections • Qualitative assessment of potential for future improvements Tier 2 • Quality of bicycle and pedestrian environment and facilities
DEVELOP: Support Local and Regional Economic Development Goals		
Objective	**Evaluation Criteria**	**Presentation**
• Support development and redevelopment • Provide catalyst for new development and redevelopment	• Comparisons of existing economic conditions and current growth trends • Capacity for future growth • Economic development potential	Tier 1 • Existing conditions and current growth trends: • Square feet of vacant land within ¼ mile of alignment • Current value of developed and vacant land within ¼ mile of alignment • Improvement potential of vacant parcels within ¼ mile, including large parcels Tier 2 • Existing conditions and current growth trends: • Employee, population, and housing growth • Projection of medium term development capacity of alternative • Comparison of maximum projected increases in market value in next 15 years • Qualitative assessment of downtown real estate market and economic development potential
• Increase number of downtown residents	• Vacant land suitable for residential redevelopment	Tier 2 • Qualitative assessment of downtown real estate market and economic development potential
• Support larger "catalyst" development projects	• Significant concentrations of vacant and re-developable parcels	Tier 1 • Number and acres of large parcels (>1 acre) within ¼ mile of alignment Tier 2 • Qualitative assessment of downtown real estate market and economic development potential

THRIVE: Strengthen Downtown Districts and Urban Centers		
Objective	**Evaluation Criteria**	**Presentation**
• Support existing residential and employment centers	• Connections with residential and employment centers	Tier 1 • Population and employment within ¼ mile of alignment Tier 2 • Population, employment, and households within ¼ mile of stations
• Support visitor and special event activities	• Proximity to visitor and special event venues	Tier 1 • Major hotels, hotels room, special event venues, and attendance within ¼ mile of alignment Tier 2 • Major hotels, hotels room, special event venues, and attendance within ¼ mile of stations
• Improve service to transit dependent populations	• Number of low income and zero-vehicle households, and the minority, elderly, and disabled population with access to high capacity transit	Tier 1 • Number of low-income and zero-vehicle households within ¼ mile of alignment • Minority, elderly, and disabled population within ¼ mile of alignment Tier 2 • (This criterion was not carried forward as Tier 1 indicated few differences)
• Incorporate public and stakeholder input	• Strong support/opposition from affected populations	Tier 1 • Inventory and summary of public comment about individual alignments Tier 2 Same as Tier 1
SUSTAIN: Create an Environment that Will be Sustainable Over the Long Term		
Objective	**Evaluation Criteria**	**Presentation**
• Develop cost effective transit solutions • Improve effectiveness and efficiency of existing transit service • Optimize return on public investment	• Potential to improve effectiveness and efficiency of existing transit service • Ridership • Operating costs • Capital Costs • User benefits • Cost-effectiveness	Tier 1 • Ability to provide strong transit spine Tier 2 • Ridership • Operating costs • Capital costs • User benefits • Cost effectiveness: - Cost per new corridor transit rider - Cost per hour of user benefits
• Provide reliable transit service	• Ability to provide dependable service without gaps	Tier 1 • Number of partial and full day street closures Tier 2 • Same as Tier 1
• Convert surface parking to higher value uses	• Surface and structured parking available	Tier 2 • Acres of surface and structured parking within ¼ mile of alignment • Qualitative assessment of redevelopment potential
• Impact on utilities and their potential need for modification or relocation	• Location, size, and number of utility lines • Negative impacts on communication lines	• Utility impact score • Alignment ranking from major communication companies
• Provide sustainable funding for corridor improvements and operations	• Potential to attract diverse set of private and public sector funding	Tier 2 • Description of funding strategies
• Minimize/mitigate impacts on natural and historic resources • Improve air quality	• Impacts on natural resources • Impacts on air quality • Impacts on historic resources	Tier 2 • Assessment of traffic impacts (positive and negative) on corridor vehicular travel • Inventory and assessment of impacts on natural resources within ¼ mile of each alignment • Inventory and assessment of impact on historic resources within ¼ mile of each alignment

3. Alternatives Considered

3.1 Introduction

As described in Chapter 1, this downtown corridor AA is one of a series of efforts undertaken to examine improved transit service in the downtown corridor. Most recently, in 2008 and 2009, KCATA conducted the North-South Alternatives Analysis that examined the development of a regional light rail system that would have included service through the downtown corridor. That study never selected an LPA because a proposed sales tax initiative that would have funded the system failed, which made the selection of an LPA moot. However, that study did develop a short-list of five downtown corridor alignments, all of which were on existing roadways or short sections of new rights-of-way, and could be used by streetcar, enhanced bus, or regular bus service.

Typically, Alternatives Analyses such as this consist of the development of a Tier 1 "long-list" of alternatives that are screened to a short-list of Tier 2 alternatives that are then evaluated in detail. However, in the case of the alignments identified in the North-South AA, all could be used equally well by any modes, as could other parallel streets that were raised as potential alignments in the initial phases of this study. As a result, to take advantage of the earlier work and to expedite the process, the approach used in this study was to use the Tier 1 screening to shortlist alignments, and then to develop Tier 2 alternatives that consisted of different combinations of modes and the shortlisted alignments. Consistent with that approach, this chapter describes the Tier 1 alignments and the Tier 2 alternatives.

3.2 Tier 1 Alignments

Seven different alignments were identified and evaluated during Tier 1. They consisted of four "bi-directional" alignments in which service would operate in both directions on the same street, and three "couplet" alignments in which service would operate northbound along one street, and southbound along a parallel street. In the case of streetcar service, the couplet alternatives were viewed as a possible way to expand development-related benefits from one street to two. The seven alignments evaluated included (see also Figure 3-1 and Figure 3-2):

Bi-directional Alignments

- Grand Avenue
- Main Street
- Walnut Street
- Baltimore Avenue

Couplet Alignments

- Grand Avenue/Walnut Street
- Walnut Street/Main Street
- Main Street/Baltimore Avenue

Figure 3-1: Tier 1 Bi-Directional Alignments

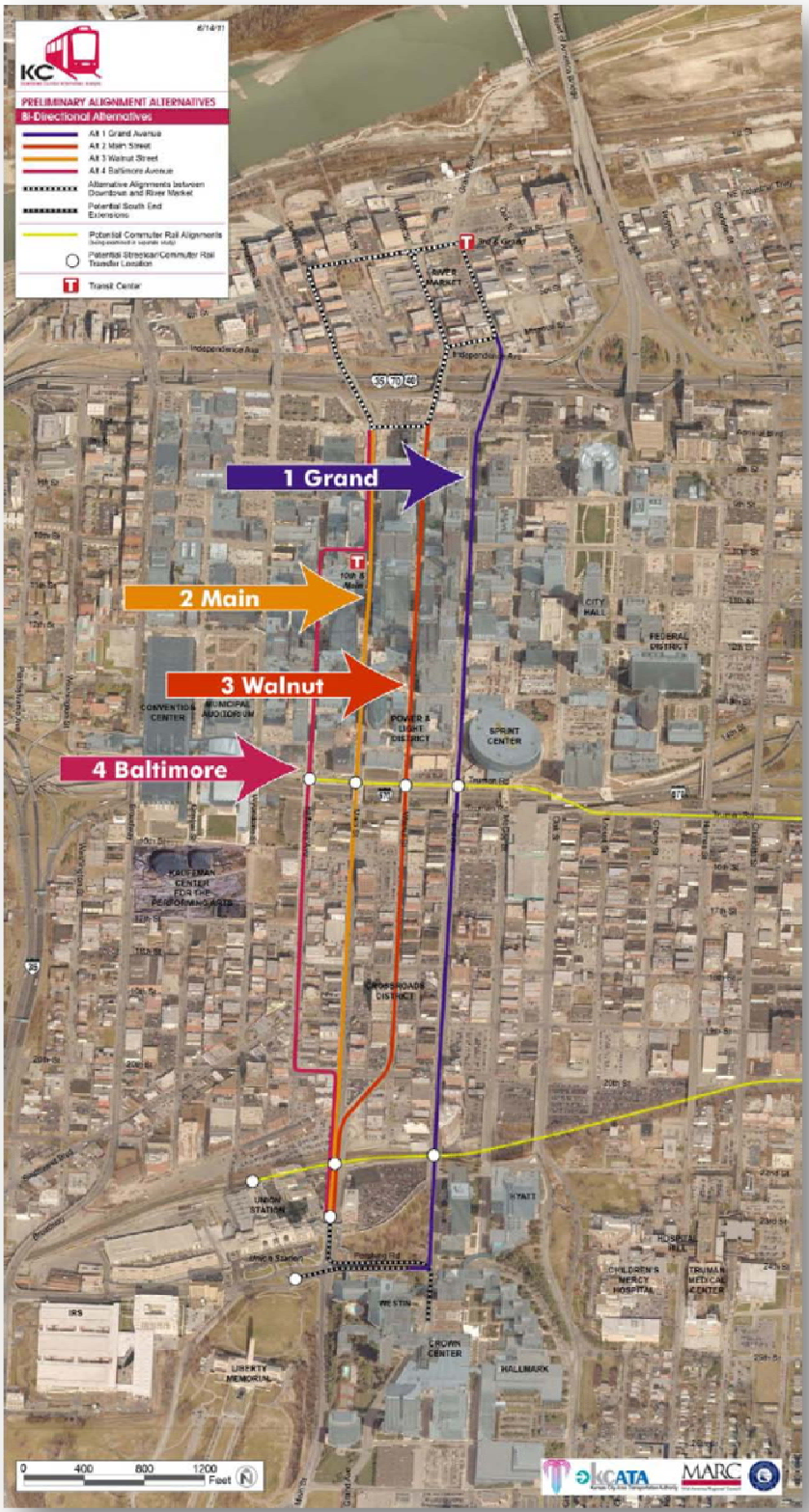
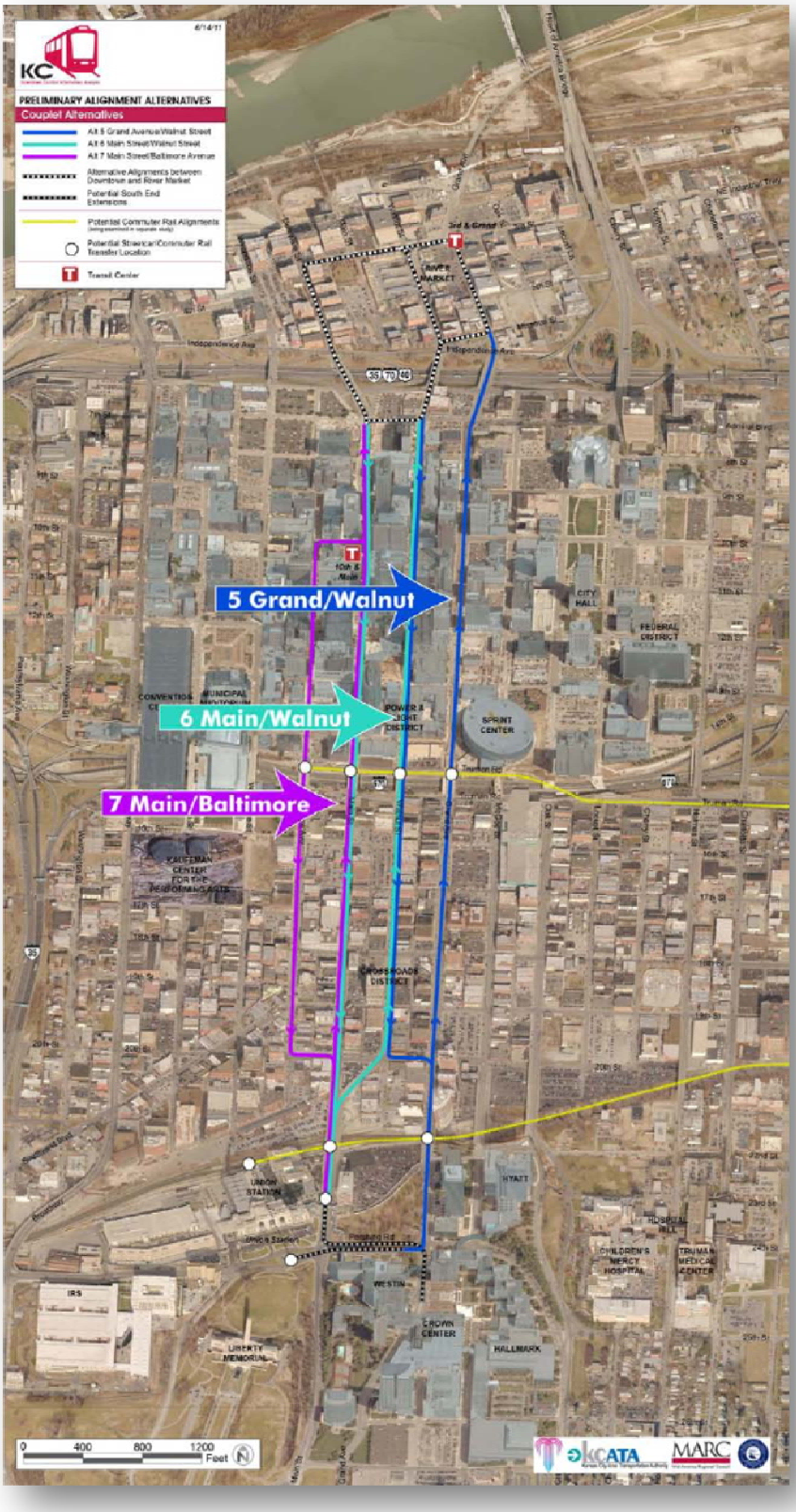


Figure 3-2: Tier 1 Couplet Alignments



All alignments would run from a northern terminus at 3rd Street near Grand Avenue in the River Market District[1] to a southern terminus at Union Station or Crown Center. All alignments would also serve the heart of downtown, Crossroads, and Crown Center.

Finally, along with each primary alignment were multiple alignment options at the north and south ends. At the north end, between Admiral Boulevard and 3rd and Grand, three different alignments were considered, which were Delaware Street, through River Market, and Grand Avenue. At the south end, service could terminate at either Union Station or Crown Center. Furthermore, at Crown Center, service could terminate on Pershing Road or Grand Avenue.

Alignment 1: Grand Avenue

Alignment 1 would operate between Union Station or Crown Center east on Pershing Road, and then between Crown Center and the Financial District via Grand Avenue. From the Financial District, service would most likely operate to 3rd and Grand directly via Grand Avenue or through River Market (the feasibility of which was investigated during the Tier 2 analysis).

This alignment would serve one of the corridor's two major streets, as well as the Sprint Center. Grand Avenue would bring service closest to the Federal District but farthest from the Convention Center and Kauffman Center.

Alignment 2: Main Street

Alignment 2 would begin service at either Crown Center or Union Station in the same manner as Alignment 1. It would then operate directly along Main Street to the Financial District. From the Financial District, it would operate to 3rd and Grand in a manner similar to Alignment 1, via one of three options:

- North on Delaware Street to east on 3rd Street
- East on Admiral Boulevard, north on Walnut Street through River Market, and east on 3rd Street
- East on Admiral Boulevard, north on Walnut Street, east on Missouri Street, and north on Grand Avenue

This alignment would operate on the second of the corridor's two main streets and through the center of the downtown core. It would split the distance between the Sprint Center and the Convention Center and Kauffman Center, and directly connect with KCATA's 10th and Main transit center. However, Main Street is farther to the west of the Federal District.

Alignment 3: Walnut Street

Alignment 3 would operate between Crown Center or Union Station and River Market primarily along Walnut Street. If service began at Crown Center, it would operate west on Pershing Road, north on Main Street, and north on Walnut Street to the Financial District. If service began at Union Station, it would

[1] Note, however, that if the Regional Rail AA, which is being conducted concurrently with this AA, recommends that regional commuter rail service operate to the River Market area, then the northern terminus would be extended north along Grand Avenue to the railroad tracks to provide connections between the two services.

start on Main Street along the side of Union Station near the entrance to The LINK and would operate north on Main Street to Walnut Street. From the Financial District, service would operate via one of three alignments:

- West on Admiral Boulevard, north on Delaware Street, and east on 3rd Street
- North on Walnut Street through River Market to east on 3rd Street
- North on Walnut Street, east on Missouri Street and north on Grand Avenue.

This alignment would "split the difference" between Grand Avenue and Main Street, which are the corridor's two primary streets.

Alignment 4: Baltimore Avenue

Alignment 4 would operate mostly along Baltimore Avenue, plus Main Street along its southern and northern ends. Service would begin at either Crown Center or Union Station in the same manner as Alignment 2. Then, from Union Station, it would operate north on Main Street, west on 20th Street, north on Baltimore Avenue, east on 10th Street past the 10th and Main transit center, and then north on Main Street. From the Financial District, it would operate to 3rd and Grand along the same potential alignments as Alignment 3 Main Street.

This Alignment would provide service along the west side of the corridor, closest to existing residential neighborhoods, the Convention Center, and the Kauffman Center. However, it would be farthest from the Federal District and the Sprint Center.

Alignment 5: Grand Avenue/Walnut Street

Alignment 5 would primarily operate northbound on Grand Avenue and southbound on Walnut Street (which would require that Walnut Street be converted to two-way traffic, or that its direction be reversed from northbound to southbound). Northbound service would operate in the same manner as Alignment 1 from either Union Station or Crown Center east on Pershing Road, north on Grand Boulevard to the Financial District, and then through River Market to 3rd and Grand.

Southbound service would operate from 3rd and Grand either south on Grand Avenue to west on Missouri Street to Walnut Street or west on 3rd Street to south though River Market to Walnut Street. It would then operate south on Walnut Street, east on 20th Street, south on Grand Avenue, and then along Grand Avenue and Pershing Road back to its southern terminal.

This couplet alignment would provide similar service as a combination of Alignments 1 and 2, and would focus service toward the eastern side of the corridor.

Alignment 6: Walnut Street/Main Street

Alignment 6 would primarily operate northbound on Walnut Street and southbound on Main Street. Northbound service would operate in the same manner as Alignment 2 and southbound service would operate in the same manner as Alignment 3.

This couplet alignment would provide similar service as a combination of Alignments 2 and 3, and would focus service toward the middle of the corridor.

Alignment 7: Main Street/Baltimore Avenue

Alignment 7 would primarily operate northbound on Main Street and southbound on Baltimore Avenue. Northbound service would operate in the same manner as Alignment 3 and southbound service would operate in the same manner as Alignment 4.

This couplet alignment would provide similar service as a combination of Alignments 3 and 4, and would focus service toward the western side of the corridor.

3.3 Tier 2 Alternatives

As described in detail in Section 4.1, the Tier 1 screening process recommended further study of the Grand Boulevard and Main Street Alignments. For these two alignments, modal alternatives were further developed and evaluated in the Tier 2 Screening. For the Tier 2 evaluation, the alternatives were developed as follows:

- The Build alternatives examined streetcar service along Grand Boulevard and Main Street. The examination of streetcar service was the impetus for the study, and financial limitations precluded the evaluation of more expensive options such as a more extensive light rail system. The two Build Alternatives–Grand Boulevard Streetcar and Main Street Streetcar–are shown in Figure 3-3.
- The No Build alternative, which is consistent with FTA procedures, consisted of existing transit services plus those improvements that are currently planned for future implementation. Changes that are planned and would be made in any event are those that are currently being planned as part of KCATA's Comprehensive Service Analysis (CSA).

The TSM alternatives, which are consistent with FTA procedures, were defined to consist of lower-cost bus alternatives (when compared to the Streetcar Build alternatives) that would still produce meaningful service improvements. The TSM alternatives would provide high-quality, or "Enhanced Bus" service along Grand Boulevard and Main Street. The two TSM Alternatives–Grand Boulevard Enhanced Bus (1B) and Main Street Enhanced Bus (2B)–are shown in

- Figure 3-4.

Key elements of the alternatives are summarized in Table 3–1 and described in the following sections. To the greatest extent possible, the Streetcar and Enhanced Bus alternatives were designed to provide as similar service as possible, while also taking advantage of the unique characteristics of each.

Figure 3-3: Tier 2 Streetcar Alignments and Station Locations

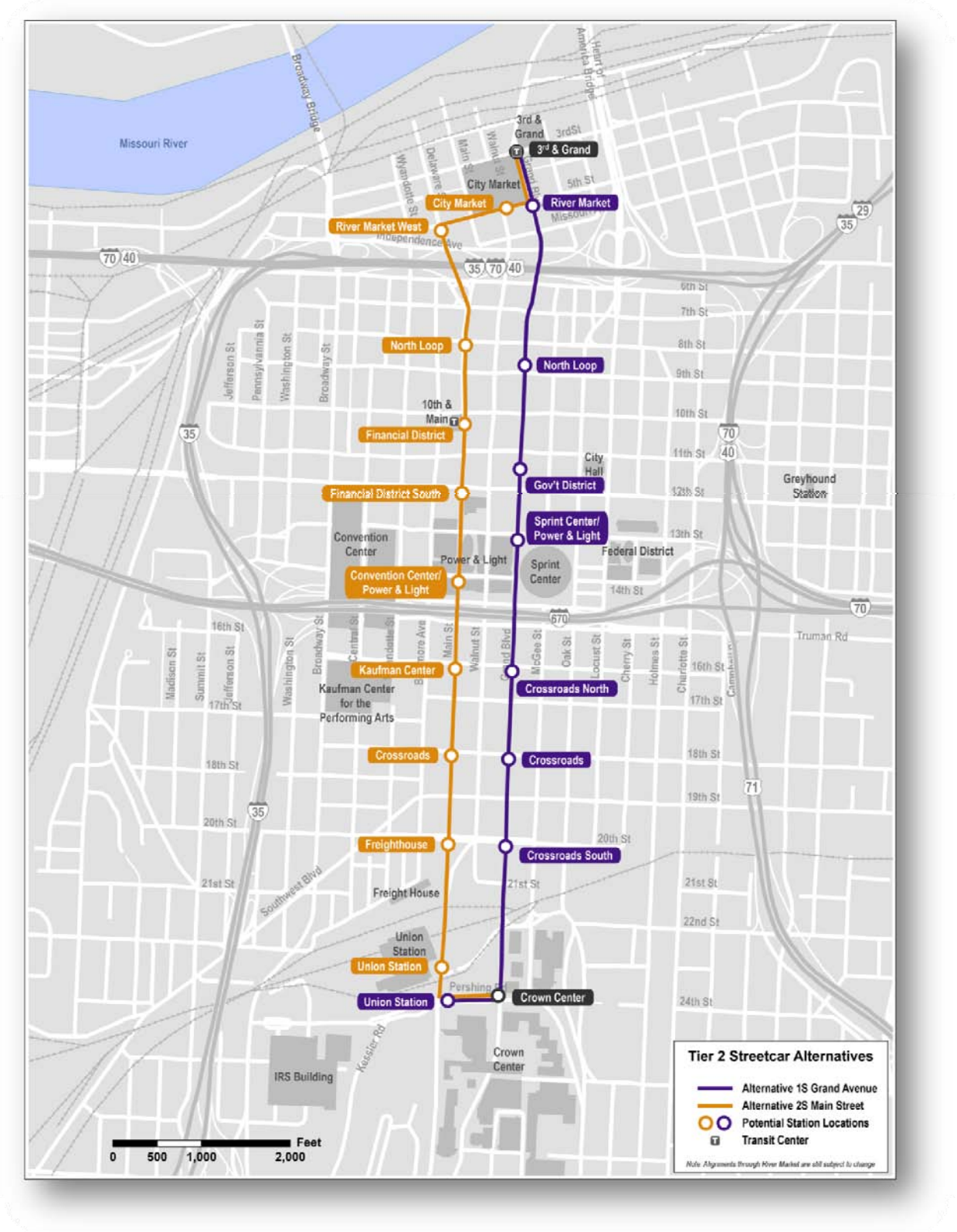


Figure 3-4: Tier 2 Enhanced Bus Alignments and Stop Locations

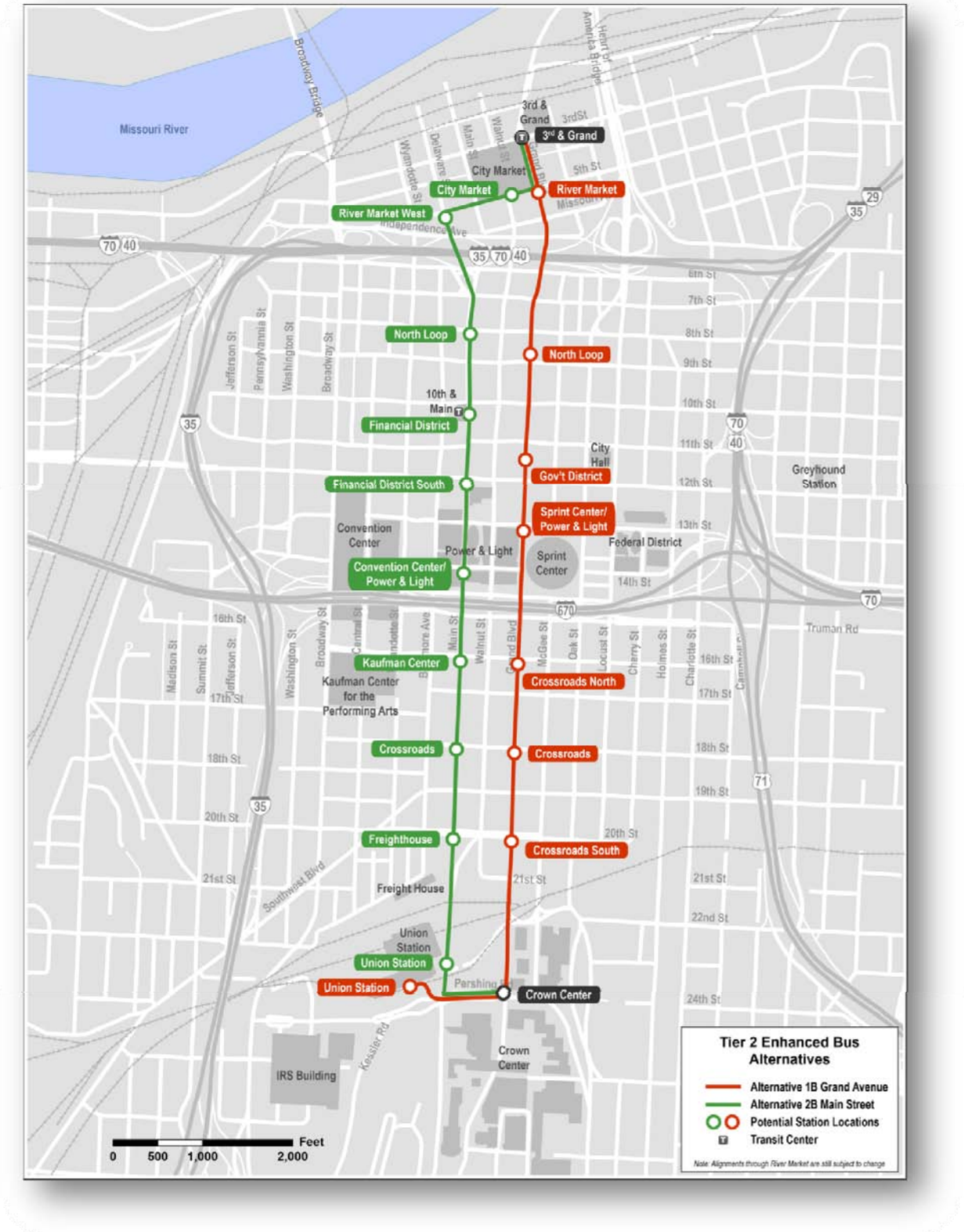


Table 3–1: Major Features of Tier 2 Alternatives

	No-Build	Build: Streetcar	TSM: Enhanced Bus
Vehicle Technology	Existing mix of MAX and local bus service	Modern streetcar	MAX-style buses
Stations	Existing MAX stations and local bus stops	Similar to enhanced bus but with longer shelter and platform lengths, and on-vehicle ticketing	MAX-like stations and amenities plus off-vehicle ticketing
Operations	Continuation of existing bus routes with CSA improvements	Operation on existing streets, primarily in mixed traffic	Operation on existing streets, primarily in mixed traffic
Station Locations	Existing locations only	Approximately every two blocks	Approximately every two blocks
Transit Priority	Peak period bus lanes in some areas along Main Street MAX	♦ Bulb outs at some side station locations ♦ Limited sections of streetcar only operation ♦ Traffic signal priority at some intersections ♦ Separate streetcar signal phases at some intersections	♦ Queue jump lanes at signalized intersections ♦ Limited areas with bus only lanes ♦ Traffic signal priority at some intersections
Roadway and Traffic Changes	Existing traffic configurations maintained (which includes peak period bus lanes in some areas)	♦ For the Main Street alternative, Main Street converted to 2 lanes in each direction ♦ On both Main and Grand, left turns prohibited at some intersections	For the Main Street alternative, Main Street converted to 2 lanes in each direction with center left-turn lane south of the Loop

Source: Nelson\Nygaard, October 2011.

3.4 Overview of Modern Streetcar Service

Modern streetcar service, as the name implies, would consist of rail service provided with modern streetcars (see Figure 3-5). This service would be similar to light rail service but with the following differences:

- Service would be provided with single-vehicle trains
- Service would largely operate in mixed traffic
- Stations would be spaced more closely (due to the circulator nature of the service)
- Stations would be smaller in scale (largely due to the shorter train length)

However, even with these differences, the basic infrastructure (such as rails, overhead wires, stations, etc) would be the similar as for light rail. As a result, in the future, light rail service from outer locations could also operate along the streetcar tracks.

Figure 3-5: Portland and Seattle Modern Streetcar Service

Source: www.flickr.com/photos/sp8254/2681192785; www.milwaukeeconnector.com/vehicles.html

Modern Streetcar Vehicles

Modern streetcars are single-unit low-floor vehicles with articulated sections that allow them to navigate tight turns (see Figure 3-6). They typically carry approximately 30 seated passengers and 100 standing passengers; this configuration is common because most trips are short and standing is often convenient. They also have interior room for on-board fare vending and bicycles.

Modern streetcars are typically powered by overhead catenary, although some can travel for short distances using battery power. (New technologies are now under development that would allow for underground power supply, but there are none in production or operation yet.) The vehicles are designed for in-street mixed-traffic operation and can also operate in exclusive environments.

Figure 3-6: Modern Streetcar Vehicle (Kinkisharyo AmeriTram and United Streetcar)

Source: Kinkisharyo; Wikipedia

Streetcar Stations

Streetcar stations are generally of a similar scale as bus stops, with similar length platforms (because the platforms do not need to extend the full length of the vehicles) and facilities. As illustrated in Figure 3-7, Portland's streetcar stops are relatively basic, and Tacoma's are more elaborate. For this study , it is assumed that facilities for both streetcar and enhanced bus services would be similar to KCATA's MAX station facilities (as illustrated below in the Enhanced Bus section).

Figure 3-7: Portland Bulb-Out Station and Tacoma Side Platform Station

Sources: Light Rail Now; Transportation Choices Blog (http://www.lightrailnow.org/news/n_000007.htm)

The layout and design of a individual stations would be dependent on a number of factors including:

- The location of the stop in the roadway (curbside or median)
- The location of the stop with respect to an intersection (near or far-side)
- The dimensions and configuration of the streetcar vehicle, including presence of doors and ADA boarding locations
- The availability of space (including sidewalk) behind the street curbs and within the right of way
- Station facilities
- The presence or absence of on-street parking at the site of the stop
- Americans with Disabilities Act (ADA) Standards for Accessible Design
- State/local codes and regulations

Minimum platform lengths will need to match the low-floor boarding area from the first door to the last door. The length can vary among streetcar manufacturers, but most stations require 60 to 70 feet of length. Curbside stations require about eight feet of width and bi-directional median stations require about 10 feet of width. For curbside stations, that width can be provided through curb bulb-outs or through use of the sidewalk. Platform heights are typically 14 inches.

Streetcar Operations

Streetcar service would operate in mixed-traffic in nearly all areas. Exceptions would be at the two terminals along Pershing Road and the terminal stub at 3rd and Grand in River Market. As described in more detail in the description of individual alternatives, depending upon the alternative and street segment, streetcar service would be either curb or center running.

Station Locations

Stations would be located approximately every two blocks, at the approximate locations presented below in the description of the individual alternatives.

Transit Priority

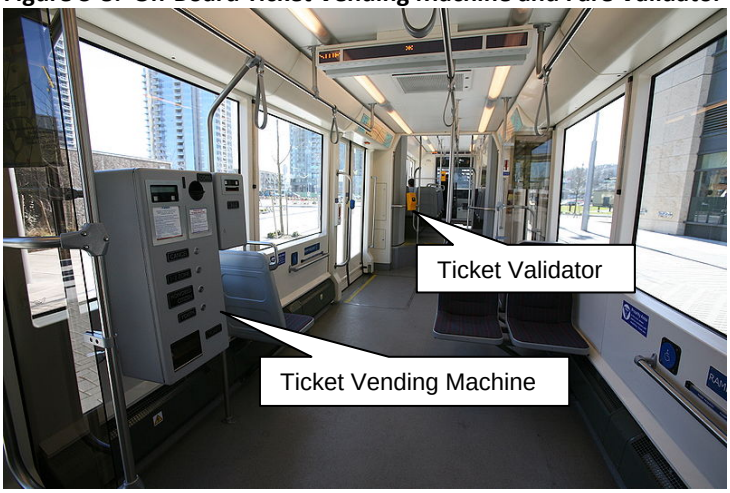
Three different types of transit priority would be used:

- Exclusive rights-of-ways at the terminal locations (on Pershing Road and 3rd and Grand).
- Transit signal priority at key intersections. Signal priority could be used to hold lights green for approaching streetcars and shorten red times for streetcars stopped at intersections. Signal priority locations that could be used have not yet been defined. These would be defined as the design is advanced.
- Separate signal phases at intersections where streetcars would need to operate across general traffic lanes.

Fare Collection

Streetcar fare collection could be via ticket purchases from ticket machines on the Streetcar Vehicles or at the stations; or a free fare system could be used. Typical onboard ticket vending machines and validators are shown on Figure 3-8).

Figure 3-8: On-Board Ticket Vending Machine and Fare Validator



Source: Wikipedia (http://en.wikipedia.org/wiki/Automated_Fare_Collection_System)

3.5 Overview of Enhanced Bus Service

Enhanced Bus service would consist of high-quality bus service that would provide similar service as Streetcar service. Its physical attributes would be very similar to existing Main Street and Troost MAX service, but it would serve short trips within the downtown corridor. In summary:

- Service would be provided with Diesel-Electric Hybrid BRT buses.
- Stations would be similar to Main Street and Troost MAX stations.
- Stations would be spaced approximately every two blocks.

Enhanced Bus Vehicles

Enhanced Bus service could use a similar vehicle as KCATA's new Troost BRT service, which are 42-foot hybrid diesel-electric BRT vehicles (see Figure 3-9).

Figure 3-9: KCATA MAX Hybrid BRT Vehicle

Source: KCATA; Gillig

Stations

Enhanced Bus stations would be similar to KCATA's MAX station facilities (see Figure 3-10). These stations have attractive shelters, seating, pillars that make the station easy to locate and identify, and real-time passenger information.

Figure 3-10: Main Street and Troost MAX Stations

Source: KCATA

Enhanced Bus Operations

With limited exceptions (as described in the description of the individual alternatives) Enhanced Bus service would operate in mixed-traffic.

Station Locations

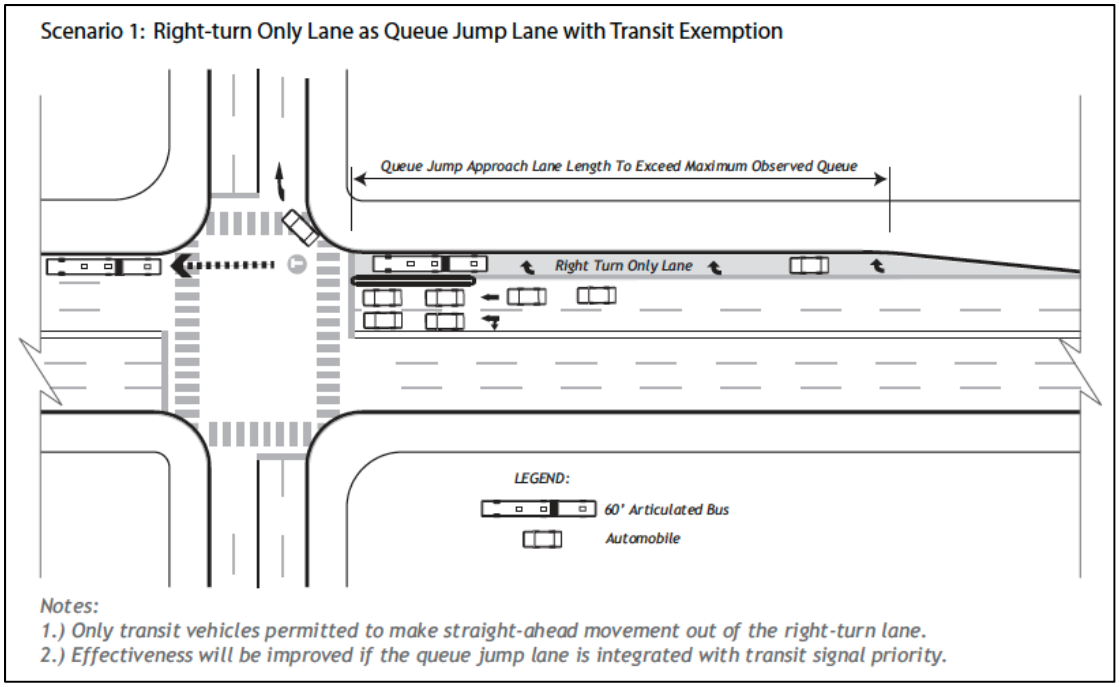
Stations would be located approximately every two blocks, at the approximate locations described below in the description of the individual alternatives.

Transit Priority

Two different types of transit priority could be used for the downtown corridor transit options:

- Queue jump lanes at signalized intersections to reduce signal-related delays would include special lanes that allow buses to bypass congested intersections. As illustrated in Figure 3-11, they can allow buses to use curbside lanes, including right turn lanes, to bypass congestion in general traffic lanes. Queue jump lanes can also be used in conjunction with transit signal priority through which buses are given a green light slightly before the general traffic lanes.
- Transit signal priority at key intersections (similar intersections as with streetcar service). Signal priority would hold lights green for approaching vehicles and shorten red times for vehicles stopped at intersections.

Figure 3-11: Queue Jump Lane Example



Source: Valley Transit Authority BRT Service Design Guidelines

Fare Collection

Since buses do not have the same amount of interior room as streetcars, and to avoid boarding delays, passengers would purchase tickets from ticket vending machines located at the stations rather than as they board the bus (see Figure 3-12).

Figure 3-12: Typical Off-Vehicle Vending Machines: Everett, WA and the Bronx, NY

Source: Community Transit (Flyertalk.co)

3.6 Description of Tier 2 Alternatives

3.6.1 No Build Alternative

KCATA currently operates 12 north-south routes between Crown Center and the Financial District with the highest quality and most frequent service provided by Main Street MAX. Main Street MAX mostly operates on Main Street but also deviates off Main Street to provide service directly to the Convention Center and east-west service through the Financial and Government Districts. Other north-south services are concentrated on Main Street, Walnut Street, and Grand Boulevard. Johnson County Transit also operates bus service on various streets in the study area.

Johnson County Transit (The Jo) provides eleven commuter routes from various origins to Downtown Kansas City, Missouri, as shown in Figure 3-13. Once they reach the downtown area, those routes travel along four different alignments. All Johnson County Transit routes approach from the south on I-35. Three of the four alignments use Main Street as a major north-south spine through the downtown area.

Figure 3-13: Johnson County Transit Routes in downtown Kansas City

As can be seen in Figure 3-14 and Table 3–2, KCATA's current downtown services are complex; KCATA is working to better rationalize the service. KCATA is currently completing a Comprehensive Service Analysis of all of its Kansas City, Missouri routes, and that study is expected to produce improvements to most KCMO bus services. In some cases, these improvements may result in the consolidation of some services between Crown Center and the Financial District, including Route 57 South Oak, which is the local service counterpart to Main Street MAX, with Main Street MAX in order to provide more frequent midday and evening Main Street MAX service. The specific changes that are being considered as part of the Comprehensive Service Analysis are still being determined and will not be finalized until early 2012.

Figure 3-14: Map of Existing KCATA Downtown Corridor Bus Service

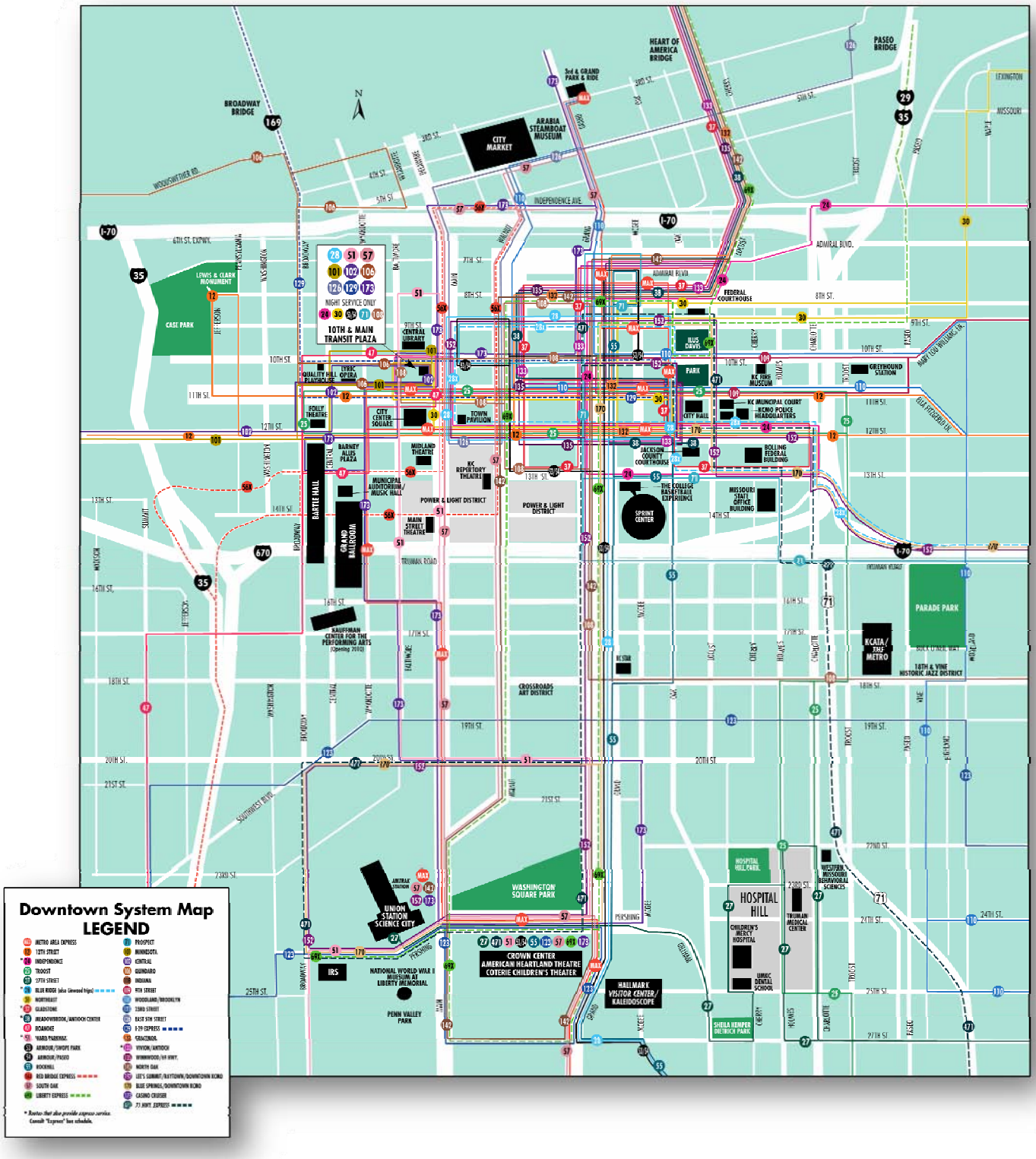


Table 3–2: Existing KCATA Bus Routes Serving Crown Center and Downtown Kansas City

Route Name/Number	Routing into Downtown	Destination in Downtown KCMO	Frequency	
			Peak	Base
Main Street MAX	Main	3rd/Grand Park and Ride	10	15
Route 57 South Oak	Walnut/Main	3rd/Grand Park and Ride	30	60
Route 53 Armour-Swope Park	Grand	Admiral/McGee	15-30	30-60
Route 54 Armour-Paseo	Grand	Admiral/McGee	15-30	30-60
Route 28 Blue Ridge	Grand	8th/Main	20*	40
Route 51 Broadway	Grand/Main	10th/Main	20-30	45
Route 55 Rockhill	Grand/Oak	Admiral/McGee	3 trips**	
Route 69X Liberty Express	Grand AM/Walnut PM	8th/Walnut	2 trips**	
Route 142 North Oak	Walnut inbound Grand outbound	Grand/Admiral	20	60
Route 152 Lee's Summit Raytown	Grand	10th/Main	4 trips**	
Route 170 Blue Springs Express	Grand	Grand/10th	4 trips*	
Route 471 71 Highway Express	Grand	Pershing/Grand	5 trips*	

*Notes: *Southbound only; ** Peak direction and peak hour only*

3.6.2 Grand Boulevard Streetcar Alternative

As illustrated in Figure 3-3, and for the purpose of the Tier 2 analysis, the Grand Boulevard Streetcar Alternative transit service would operate from Crown Center to River Market along Pershing Road and Grand Boulevard. In combination with the streetcar elements described above, key features of this alternative would include:

Alignment/Operations: From south to north, two-way streetcar service would operate within a single stub end track along Pershing Road. Between Pershing Road and I-70, streetcar service would operate in the center lanes of Grand Avenue. Between I-70 and 3rd and Grand, streetcar service would operate within the single lane of travel in each direction.

Stations: Stations would be spaced approximately every two blocks as show in Table 3–3.

Table 3–3: Grand Boulevard Streetcar Alternative Potential Station Locations

Station	Location
Union Station	Pershing at Grand
Crown Center	Grand at Pershing
Crossroads South	Grand at 20th
Crossroads	Grand at 18th
Crossroads North	Grand at 16th
Sprint Center/Power & Light	Grand at 13th
Government District	Grand at 11th
North Loop	Grand at 9th
River Market	Grand at 5th
3rd & Grand	Grand at 3rd

Service Levels: For the Tier 2 analysis, it was assumed that the Grand Boulevard streetcar service would operate seven days a week, with service from 6:00 am to 12:00 midnight Monday through Thursday, from 6:00 am to 2:00 am on Fridays and Saturdays, and from 8:00 am to 9:00 pm on Sundays (see Table 3–4). Service would operate every 10 minutes except on weekdays after 9:00 pm and on Sundays, when it would operate every 20 minutes.

Table 3–4: Grand Boulevard Streetcar Alternative Span of Service and Frequencies

Day / Service Hours	Service Frequency (minutes)
Monday - Thursday	
6 am - 9 pm	10
9 pm - 12 pm	20
Friday and Saturday	
6 am - 2 am	10
Sundays	
8 am - 9 pm	20

Transit Priority: Two types of transit priority could be used to speed up the service. These could include:

- Transit signal priority at key intersections (locations have not yet been determined).
- Exclusive streetcar-only phases at intersections where streetcar service at the terminals where streetcars would enter and exit from general purpose travel lanes.

Transit Integration: With streetcar service on Grand Boulevard, changes would be made to KCATA's downtown services to operate east-west service past or close to streetcar stations. In addition, to the extent possible, north-south routes would also be reconfigured to provide connections with streetcar service. However, KCATA's 10th and Main Transit Plaza would remain the primary downtown transit center, and thus connections with all routes would not be possible.

3.6.3 Main Street Streetcar Alternative

As illustrated in Figure 3-3, and for the purpose of the Tier 2 analysis, the Main Street Streetcar Alternative transit service would operate from Crown Center to River Market via Pershing Road, Main Street, 5th Street, and Grand Boulevard.

Alignment/Operations: With only limited exceptions, Main Street streetcar service would operate in mixed-traffic. Those exceptions would be short streetcar-only segments at the southern terminal along Pershing Road and in and out of the 3rd and Grand terminal in River Market. Along Main Street between Pershing Road and Truman Road, service could operate in the center lanes with center platforms in order to preserve parking–during off-peak periods or possibly all day–in the curb lanes. North of Truman Road, where parking is generally prohibited, service could operate in the curb lanes with stations located on the sidewalks. On 5th Street and Grand Boulevard in River Market, service could operate within the single travel lane with stations located on bulb-outs from the sidewalk.

Station Locations: As with Grand Boulevard streetcar service, stations would be spaced approximately every two blocks at the locations listed in Table 3–5.

Table 3–5: Main Street Streetcar Alternative Potential Station Locations

Station	Location
Crown Center	Pershing at Grand
Union Station	Main beneath The Link
Freighthouse	Main at 20th
Crossroads	Main at 18th
Kauffman Center	Main at 16th
Convention Center/Power & Light	Main at Truman
Financial District South	Main at 12th
Financial District	Main at 10th
North Loop	Main at 8th
River Market West	5th Street at Main
City Market	5th at Walnut
3rd and Grand	Grand at 3rd

Service Levels: For the Tier 2 analysis, it was assumed that the Main Street streetcar service would operate seven days a week, with service from 6:00 am to 12:00 midnight Monday through Thursday, from 6:00 am to 2:00 am on Fridays and Saturdays, and from 8:00 am to 9:00 pm on Sundays. However, whereas Grand Boulevard would operate every 10 or 20 minutes, Main Street streetcar service would operate every 11 or 22 minutes (see Table 3–6). This is because the Main Street alignment would be slightly longer, and in order to keep the peak streetcar vehicle requirements at three, it would be necessary to operate at slightly longer headways.[2]

Service would operate every 11 minutes except on weekdays after 9:00 pm and on Sundays, when it would operate every 22 minutes.

Table 3–6: Main Street Streetcar Alternative Span of Service and Frequencies

	Service Frequency (minutes)
Monday - Thursday	
6 AM - 9 PM	11
9 PM - 12 PM	22
Friday and Saturday	
6 AM - 2 AM	11
Sundays	
8 AM - 9 PM	22

Traffic and Parking Changes: Two types of changes would likely be made with streetcar service:

- South of 14th Street, where service would operate in the median lanes south of 14th Street, left turns would be prohibited at intersections with center stations.

[2] Note, however, that the operating plans that were developed as part of this study were designed to be conservative, and as part of the design of the project, it may be possible to determine additional transit priority measures that would speed service sufficiently to operate service at 10 and 20 minute headways.

- Between 14th Street and 9th Street, where service would operate in the curb lane, on-street parking would be eliminated.

Transit Priority: Three different types of transit priority would be used to speed streetcar service. These would include:

- The dedicated streetcar segments at the terminals (as described above).
- Transit signal priority at key intersections.
- Separate signal phases at intersections where streetcars would need to operate across general traffic lanes.

Transit Integration: With streetcar service on Main Street, it was assumed for analysis purposes that Main Street MAX would be relocated from Main Street to Grand Boulevard. This assumption would provide premium service on both of the corridor's primary arterials. In addition, changes would be made to operate east-west service past or close to streetcar stations. Changes would also be made to north-south routes to provide connections with streetcar service. Many of these connections would be provided at KCATA's 10th and Main Transit Plaza, which would be directly served by Main Street streetcar service.

3.6.4 Grand Boulevard Enhanced Bus Service Alternative

As was illustrated in Figure 3-4, the Grand Boulevard Enhanced Bus service was assumed to operate from Crown Center to River Market via Pershing Road and Grand Boulevard.

Alignment/Operations: Grand Boulevard enhanced bus service would operate along the same alignment as Grand Boulevard streetcar service. One exception would be that enhanced bus service would start at the front door of Union Station rather than Pershing Road at Main Street. This would be because there would be no additional cost for the more direct service, as this outer loop would be the most efficient bus turnaround.

In terms of operations, and from south to north, service would operate in mixed-traffic south of the Loop, but with queue jump lanes at most signalized intersections to avoid delays. Within the Loop, service would operate in curbside exclusive bus lanes during peak periods, and in mixed-traffic during off-peak periods. North of the Loop, service would operate in mixed-traffic with queue jump lanes at key intersections.

Station Locations: Stations would be at the same locations as with Grand Boulevard (as described above) except that the southern terminal would be located directly in front of Union Station instead of on Pershing Street at Main Street.

Service Levels: Grand Boulevard enhanced bus service would operate every 10 to 20 minutes, seven days a week, in the same manner as Grand Boulevard streetcar service.

Transit Priority: Three types of transit priority would be used to speed service. These would include:

- Queue jump lanes at signalized intersections north and south of the Loop.
- Peak period exclusive bus lanes within the Loop.

- Transit signal priority at key intersections.

Roadway and Parking Changes: Enhanced bus service would operate in the right hand general traffic lanes, but with queue jump lanes at signalized intersections. Some on-street parking would be eliminated to develop the queue jump lanes.

Transit Integration: As with streetcar service on Grand Boulevard, changes would be made to KCATA's downtown services to operate east-west service past or close to enhanced bus stations. In addition, to the extent possible, north-south routes would also be reconfigured to provide connections with the service. However, KCATA's 10th and Main Transit Plaza would remain the primary downtown transit center, and thus direct connections with all routes would not be possible.

3.6.5 Main Street Enhanced Bus Service Alternative

As was illustrated in

Figure 3-4, for purposes of the Tier 2 evaluation the Grand Boulevard Enhanced Bus service was assumed to operate from Union Station to River Market primarily along Main Street.

Alignment/Operations: South of the downtown loop, service would operate in mixed-traffic, but with queue jump lanes at most signalized intersections to avoid delays. Within the Loop, service would operate in curbside exclusive bus lanes during peak periods and in mixed-traffic during off-peak periods. North of the Loop, service would operate in mixed-traffic with queue jump lanes at key intersections.

Stations: Station would be located at the same locations as with Main Street streetcar service (as described above).

Service Levels: Main Street enhanced bus service would operate every 10 to 20 minutes, seven days a week, in the same manner as Grand Boulevard streetcar or enhanced bus service. Note that this would be slightly more frequent than the 11- and 22-minute headways that would be associated with streetcar service on Main Street.

Transit Priority: As with enhanced bus service on Grand Boulevard, three types of transit priority would be used to speed service. These would include:

- Queue jump lanes at signalized intersections north and south of the Loop.
- Peak period exclusive bus lanes within the Loop.
- Transit signal priority at key intersections.

Roadway and Parking Changes: With enhanced bus service on Main Street, between Walnut Street and the Loop, the traffic configuration could be revised to two lanes in each direction with a middle left turn lane. The curb lanes could be used for parking and queue jump lanes on an all-day basis or only during off-peak periods. In areas where on-street parking is permitted, the development of queue jump lanes would eliminate some parking. Within the Loop, in most areas, the right-hand lanes would be used as dedicated bus lanes during peak periods, and for general traffic and/or parking during off-peak periods.

Transit Integration: The same local transit service changes would be made with enhanced bus service on Main Street as with streetcar service. As described above, the most significant change would be to shift Main Street MAX to Grand Boulevard.

4. Evaluation of the Alternatives

4.1 Evaluation Process Approach and Overview

4.1.1 Evaluation Methods

Consistent with FTA guidance, this *Kansas City Downtown Corridor Study* has followed a multi-step process to evaluate all reasonable service development options. In summary, this process consisted of:

- Identifying the range of potentially promising alignments (Tier 1 Alignments)
- Screening the Tier 1 alignments into a short-list of alignments and adding modal alternatives (Tier 2 Alternatives) for more detailed evaluation
- Conducting a detailed evaluation of the Tier 2 Alternatives
- Selecting a LPA based on the results of the detailed evaluation

In Kansas City, all of the downtown corridor transit mode alternatives could operate within the existing roadways; therefore, any potential roadway alignment could be used by modern streetcar or any form of enhanced bus service. As a result, in order to expedite the screening process, the study used a process in which the Tier 1 screening focused on selecting a short-list of alignment alternatives.[3] Once the preferred alignments were selected, the Tier 2 screening evaluated the different service alternatives – Build (streetcar), TSM (enhanced bus) and No Build – that would potentially operate along those alignments.

In both the Tier 1 and the Tier 2 screening and evaluation processes, the study alternatives were evaluated against the evaluation criteria that were developed based on the Goals and Objectives and the Purpose and Need Statement as defined in Chapter 2, and were organized around four themes and project goals, as follows:

- **Connect:** Enhance linkages in downtown Kansas City and improve local circulation
- **Develop:** Support local and regional economic development goals
- **Thrive:** Strengthen downtown districts and urban centers
- **Sustain:** Create an environment that will be sustainable over the long term

The Purpose and Need Statement lists a series of objectives under each project goal (see Chapter 2). These objectives, in turn, guided the development of the evaluation criteria that would be used in both the Tier 1 and Tier 2 evaluations. The evaluation criteria were developed to further define each objective and support evaluation of the alignments against the stated goals in a transparent and understandable manner. The evaluation criteria, grouped by study goal, are listed in Table 2–1**: Kansas City Downtown Corridor Evaluation Criteria for Tier 1 and Tier 2 Evaluation of Alternatives**

[3] Note that this process was recently accepted by FTA for the Providence Core Connector Study, which is examining the development of streetcar service in Providence, RI, and is very similar to this study.

4.1.2 Tier 1 Screening

As noted above, the downtown corridor transit service alternatives were developed to operate within existing roadways, and all potential alignments could be used by streetcar or any form of enhanced bus service. Therefore, the Tier 1 screening focused on identifying a list of promising alignments and then evaluating and narrowing the list to a short-list of alignments, rather than on combinations of alignments and modes.

As noted in Chapter 2 and presented in Table 2**–1,** the screening criteria included a wide variety of qualitative and quantitative measures that were examined at varying levels of detail. Each alignment was measured against the individual criterion in terms of in terms of relative ratings of "Best", "Good", and "Fair." The ratings reflected relative, rather than absolute, scores; consequently, alignment ratings can only be interpreted relative to the other alternatives. Additionally, because the alternatives are physically located close to each other, the differences between alternatives were often subtle. Consequently, in some cases, more than one alternative received a "Best" rating and in other cases, none of the alternatives received a "Best" rating. Likewise, when there were no discernable differences between alternatives, each alternative received the same rating.

4.1.3 Tier 2 Evaluation

Once the seven alignments were narrowed to two, the Tier 2 alternatives were developed. These alternatives included "Build", Transportation System Management (TSM), and "No-Build" alternatives. For this study, the Build alternatives consisted of streetcar service along each alignment; the TSM alternatives consisted of enhanced bus service along each alignment; and the No-Build alternative consisted of current services and currently programmed improvements.

Chapter 3 provides more a more detailed description of the Tier 2 Alternatives. The Tier 2 evaluation required that the Build and TSM alternatives be more fully developed in terms of:

- **Station Locations:** More specific station locations were determined using existing transit ridership and land-use data, together with typical stop spacing practices.
- **Operating Plans and Costs:** Conceptual operating scenarios were developed for how the downtown corridor service would operate on each of the candidate corridors by mode. Conceptual operating plans also supported other aspects of the evaluation process such as system operating costs, ridership and potential system benefits.
- **Conceptual Engineering:** The study team assessed how the downtown corridor could be developed in each of the candidate corridors and modes. The engineering and design assumptions were developed in sufficient detail to support accurate capital cost estimates, right-of-way requirements, and operating procedures and facility design. The engineering estimates were produced at a conceptual level in order to identify fatal flaw and order-of-magnitude impacts or benefits. Cost estimates were developed employing industry standard unit cost measurements.
- **Capital Costs:** The study team built on the conceptual engineering design analysis to create an estimate of the capital costs associated with development of each of the selected alternatives. Capital cost estimates were developed using quantities and technology definitions in accordance with the FTA standardized cost categories.
- **Ridership, Transit System User Benefits and Cost Effectiveness:** Using the station locations and conceptual operating plans, the study team developed ridership forecasts for each candidate

corridor and operating mode. These ridership estimates were also used to determine transit system user benefits and cost-effectiveness measures.

- **Transportation Impacts:** The study team assessed how the potential alternatives would affect downtown traffic and transportation infrastructure, such as traffic circulation, parking, and bicycle and pedestrian systems.
- **Utility Coordination:** The study team assessed the unknowns and risks associated with subsurface utilities by looking for conflicts with existing utilities.
- **NEPA Compliance:** The team conducted evaluations to identify any significant potential impacts on the environment and historic resources
- **Funding Potential:** The study team identified potential funding strategies, and evaluated whether certain alternatives may be more easily fundable than others.

Consistent with the Tier 1 screening, the Tier 2 evaluation criteria reflected project goals and objectives, and included a combination of qualitative and quantitative evaluation criteria. In many cases, the Tier 2 evaluation criteria were the same or similar to the Tier 1 evaluation criteria, but in many cases, additional criteria were used (for example, ridership, operating and capital costs, cost-effectiveness, and impacts on natural and historic resources and the environment). In nearly all cases, the Tier 2 evaluation considered the criteria in more detailed than the Tier 1 screening. The Tier 2 evaluation criteria are also summarized in Table 2–1.

4.2 Tier 1 Screening Results[4]

The Tier 1 alignments were evaluated against 13 evaluation criteria, as shown in Table 2**–1**. Conducting the evaluation process required defining a number of assumptions. Among the most critical of these was determining the influence (or capture) area associated with each alignment. For the analysis, locations were considered to be directly served by the alternative if they were within a five-minute walk, or one-quarter mile from the transit alternative.

For the bi-directional alternatives, setting a ¼-mile walking buffer is straightforward and covered all areas within ¼ mile of the alignment. For the couplet alternatives, however, the influence area was defined as the area within a ¼ mile from both legs of the couplet. This assumption means that the walking distance to and from the couplets would be smaller than for the bi-directional alternatives. The reasoning behind this assumption is that both legs of the couplet must be within ¼ mile of the activity center to be considered within walking distance.

The one exception to the above ¼-mile assumption was for development impacts. In this case, the ¼-mile buffer was defined more broadly. Couplets operate on two parallel streets; instead of requiring both legs of the alignment to be within a ¼ buffer, based on the consensus of the Partnership team, the influence area was defined as within ¼ of mile of each leg. As a result, the influence area for development impacts is larger. This reflects assumptions that development potential is not absolutely

[4] The Results of the Tier 1 Screening are detailed in the *Tier 1 Screening Results Technical Memorandum*, prepared by Nelson Nygaard in August 2011.

tied to walking distance, and being close to the alignment, even if it operates only in one direction, is sufficient to encourage development.

Note that for the Tier 1 screening, no buffer was used at the northern end of the alignments (the area around City Market) because the routings through that area had not yet been determined, and any of the "mainline" alignments could use multiple routes through the City Market area. On the southern end, the buffer was based on the end point of the alignment without any assumption regarding a potential spur along Pershing Road.

Overall, the seven alignments had different strengths and weaknesses, but each option offered potential as a viable downtown corridor. The most significant differences were in terms of improving transportation linkages, supporting existing activity centers and strengthening development potential; in these areas, Grand Boulevard and Main Street performed the best as shown in the summary analysis on Table 4–1.

Major findings from the Tier 1 Screening process include:

- Overall, bi-directional alignments scored higher than the couplets:
  - With service on two separate streets, couplets have less intuitive service design because riders would board and alight from the service in different locations. This service design also creates relatively confusing interfaces with bus services, especially with east-west connections operating on one-way streets. Consequently, the couplets are less effective at improving transportation options.
  - Walking distances to/from the couplet alternatives are shorter than those of some of the bi-directional options and thus these alignments were less accessible to/from Downtown Kansas City activity areas.
  - Because the couplet alignments affect two streets, they have increased impacts on utility systems.
  - Finally, results from initial stakeholder meetings and a public workshop suggested that the couplet alternatives are less attractive to stakeholders and members of the public.
- An important exception to the above would be the ability to support development and redevelopment. Because couplets operate on two streets, the alignments would influence a larger area in downtown Kansas City and thus have a greater potential to support development. Only the Main Street bi-directional alternative rated as strongly in terms of development and redevelopment potential.
- There would be little difference among the alignments in terms of increasing the number of residents in downtown Kansas City, thus none received a Best rating. This finding reflects the fact that downtown Kansas City is currently heavily oriented toward employment, with jobs outnumbering residents 10 to 1. Downtown corridor service could help support residential development; this criterion was evaluated more closely in the Tier 2 evaluation.
- Initial screening of the alternatives included the ability of the service to improve transit service to transit-dependent populations (i.e., low income or zero vehicle household, individuals with a disability, individuals aged 65+ or minority individuals). The analysis found that because the number of people living in the downtown corridor is small, the number of transit dependent individuals is

likewise small. There was no difference among the alternatives, thus this screening criterion was not carried forward.

Additional detail on these findings is presented in the following sections.

4.2.1 Alignment 1: Grand Boulevard

Grand Boulevard was one of the two alternatives that received a greater number of "Best" ratings. Two of the "Best" ratings were associated with providing connections to downtown activity centers and access to employment and residential areas. While several of the alignments would offer access to many of downtown Kansas City's primary activity centers (Sprint Center, Power and Light District, Crown Center, Union Station, Convention Center), Grand Boulevard is the only alternative that would be directly accessible to/from the Government District, a major employment center. As a result, the Grand Boulevard alignment directly serves the greatest number of jobs. Grand Boulevard would also have fewer and less significant utility impacts. Finally, there are several surface parking lots along Grand Boulevard; thus, Grand Boulevard rated well in terms of offering potential to reduce the amount of surface parking.

4.2.2 Alignment 2: Main Street

Main Street received five Best ratings, primarily due to Main Street's strategic location in the center of downtown Kansas City, which makes it accessible to visitor and special event activities as well as most of downtown Kansas City's major activity centers. Main Street also rated well in terms of improving circulation in downtown, because it is located adjacent to the 10th and Main Transit Plaza, currently Kansas City's largest and most comfortable transfer location. In addition, Main Street also offers potential in terms of development and redevelopment impacts, and the alignment is a higher value corridor: thus new development also has potential to achieve high values. Finally, Main Street is the alignment most preferred by members of the public and stakeholders. Public comment largely echoes other findings associated with Main Street being in the heart of downtown Kansas City and equidistant from most major activities.

4.2.3 Alignment 3: Walnut Street

Walnut Street generally performed well, but lacked a compelling reason to keep the alignment under consideration. Its strengths were that it is well positioned in downtown Kansas City in terms of access to existing employment, activity centers, and visitor attractions. However, Walnut Street is not a primary commercial corridor and consequently, tends to provide "back door" rather than "front door" access to some of downtown's major buildings and attractions. In addition, because Walnut Street is not a primary commercial corridor, the development of new transit services on Walnut Street could potentially dilute rather than strengthen the existing transit network. It also has less compelling potential development impacts with fewer vacant parcels and fewer larger sized parcels.

4.2.4 Alignment 4: Baltimore Avenue

Baltimore Avenue, like Walnut Street, performed well in the Tier 1 screening criteria process overall, but without exceptional performance in any of the criteria. Baltimore Avenue's strengths included a fairly strategic location in Kansas City with access to many of the downtown's activity centers, and visitor attractions. The corridor also offers a relatively better location with respect to existing residential development and, consequently the best potential to encourage future residential development.

However, a challenge associated with a Baltimore Avenue alignment is its distance from the Government District, the downtown's highest concentration of employment. Also, like Walnut Street, Baltimore Avenue is not a primary commercial corridor and tends to provide "back door" rather than "front door" access, and new transit services could potentially dilute rather than strengthen the existing transit network.

4.2.5 Alignment 5: Grand Boulevard and Walnut Street Couplet

The Grand Avenue/Walnut Street couplet alignment produced mixed results in the Tier 1 screening. Both streets are well positioned, such that the couplet provides access to downtown employment and population, although less than the bi-directional option on Grand Boulevard. The Grand/Walnut couplet also ranked high in terms of potential to support development and reduce the amount of surface parking downtown. The high ranking largely reflects the couplet design, which encompasses a larger area that could be positively influenced for development through improved transportation infrastructure.

Most of the challenges associated with the Grand Boulevard and Walnut Street couplet alignment reflect challenges inherent to a couplet design. Operating service on two streets is a less intuitive service design (i.e. boarding on street and alighting on another). The impact of the service design would affect not only future corridor service, but also existing and future bus service. As a result, transit benefits would be relatively more diluted when compared with the other alignments. Couplets also have increased impacts on the utility system because they require construction and operations on two streets rather than one.

4.2.6 Alignment 6: Main Street and Walnut Street Couplet

A Main and Walnut Street couplet rated well in terms of access to/from downtown's major activity centers as well as several of the visitor and special event activities. Like the other couplets, the Main/Walnut alignment also offered stronger potential to support development and redevelopment because it would influence a larger area. The couplet also would have few issues with service reliability associated with street closures.

Consistent with other couplet designs, the Main/Walnut couplet creates a less intuitive service design; however, the Main/Walnut couplet would serve the 10th and Main Transit Plaza and thus would partially help strengthen the existing downtown transit resources (although to a lesser extent than the bi-directional alignment on Main Street). Lastly, couplets have increased impacts on the utility system because they require construction and operations on two streets rather than one.

4.2.7 Alignment 7: Main Street and Baltimore Avenue Couplet

The Main Street and Baltimore Avenue couplet alignment received a best rating for its ability to support development and redevelopment. This best rating reflected a larger influence area that includes a fairly large number of vacant parcels along the couplet corridors. The location of the couplet along Main Street and Baltimore Avenue also means that the alignment would be within walking distance of a large number of activity centers and visitor attractions.

Some of the challenges associated with the Main/Baltimore couplet are associated with the less intuitive service design and the relative impact on the downtown transit network. As a result, as compared with other alternatives, especially the bi-directional ones, the Main/Baltimore couplet is less supportive of

efficient and effective transportation options in downtown. Also, as mentioned, couplet alignments had more utility impacts as compared with bi-directional options due to operations on two streets.

Table 4–1: Tier 1 Screening Summary Matrix

Alternative	C1. Downtown Circulation	C2. Activity Center Connections	C3. Bicycle & Pedestrian Connections	D1. Development & Re-development	D2. Downtown Residents	D3. New Catalyst Projects	T1. Residential & Employment Support	T2. Visitor & Special Events	T3. Public & Stakeholder Input	S1A. Transit Efficiency & Effectiveness	S1B. Reliable Service	S2. Surface Parking Reduction	S3. Utility Impacts	Best	Good	Fair
1 Grand	Good	Best	Good	Fair	Good	Fair	Best	Fair	Good	Good	Fair	Best	Best	4	5	4
2 Main	Best	Best	Good	Best	Good	Good	Good	Best	Best	Good	Good	Fair	Good	5	8	1
3 Walnut	Fair	Good	Good	Good	Good	Fair	Good	Good	Good	Fair	Fair	Good	Fair	0	8	5
4 Baltimore	Good	Good	Fair	Good	Good	Good	Good	Good	Good	Fair	Good	Good	Good	0	11	2
5 Grand/ Walnut	Fair	Fair	Good	Best	Good	Good	Good	Fair	Fair	Fair	Fair	Best	Fair	2	4	7
6 Main/ Walnut	Fair	Fair	Good	Best	Good	Good	Fair	Good	Fair	Fair	Fair	Good	Fair	1	5	7
7 Main/ Baltimore	Fair	Fair	Fair	Best	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair	1	6	6

Conclusions: Alternative 2 (Main Street) is the highest rated alignment after considering all objectives. It received the greatest number of "Best" ratings and a high number of "Good" ratings. This is mainly a result of Main Street's connections with downtown activity centers, special event venues, and transportation options, as well as its potential for development/redevelopment. Alternative 1 (Grand Boulevard) is second due to one fewer "Best" rating and a few more "Fair" ratings. Grand Boulevard has good connections to employment centers and other activity centers, and has the best pedestrian and bicycle environment, but it doesn't support visitor and special event activies as well as other alternatives. The reliability of transit service along Grand Boulevard also rates lower than other options. In general, the bi-directional alignments rate higher than the couplet ones, primariliy due to the smaller service area that reduces the number of transit and activity center connections. Service would also be less intuitive with the couplet alignments, and interactions with the local bus service would have to be carefully considered.

Notes: Walking distance analyses for the couplet alignments considers the area that can be reached by both the northbound and southbound trips, while development impact analyses for the couplets considers the area that can be reached by either the northbound or southbound trips.

4.3 Tier 2 Evaluation Results[5]

Building on the Tier 1 Screening of Alignments, the Tier 2 evaluation examined five alternatives which included a No Build Alternative and two modal technology alternatives (Enhanced Bus and Modern Streetcar) operating on the two Alignments that were forwarded from Tier 1 for further screening (Grand Boulevard and Main Street). The Tier 2 Alternatives are described in more detail in section 3.3 and include the following:

No Build

- Base Case/No-Build

Build/Streetcar

- Grand Boulevard Streetcar Alternative
- Main Street Streetcar Alternative

TSM/Enhanced Bus

- Grand Boulevard Enhanced Bus Alternative
- Main Street Enhanced Bus Alternative

The five alternatives were evaluated against the criteria described in **Table 2–1** with results presented below in terms of the project's major themes: Connect, Develop, Thrive and Sustain.

4.3.1 CONNECT: Enhance Linkages in Downtown Kansas City and Improve Local Circulation

Enhancing transportation connections and improving local circulation is a key objective of the downtown corridor study. In the Tier 2 evaluation, the "Connect" goal was evaluated according to each alternative's ability to:

- Provide quality connections between existing downtown activity centers and connections to other transit resources
- Support pedestrian and bicycle travel

These criteria revealed no differences between modes, but a slight preference for operations on Main Street. While both alignments achieved nearly equal access to the activity centers, Main Street also provided connections to the 10th and Main Transit Plaza.

4.3.1.1 Connections Between Existing Downtown Activity Centers

Improving connections between existing downtown activity centers was evaluated according to the number of activity centers within a ¼-mile distance of the planned stations and the walking distance between the stations and the activity centers.

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[5] The results of the Tier 2 Screening Analysis are documented in more detail in the *Tier 2 Screening Analysis Technical Memorandum*, prepared by Nelson Nygaard in October 2011.

4.3.1.2 Number of Activity Centers Within a ¼-Mile Walking Distance

The downtown corridor is home to a large number of major activity centers, and ideally, a new downtown corridor transit system circulator would serve as many of these as possible. In terms of travel volumes, the most important activity centers include:

- River Market
- 3rd and Grand
- 10th and Main Transit Plaza
- Convention Center
- Kauffman Center for the Performing Arts
- Power and Light District
- Sprint Center
- Bolling Federal Building
- County Courthouse
- State Office Building
- City Hall
- Greyhound Station
- Freight House
- Union Station
- IRS Building
- Crown Center

Overall, both Grand Boulevard and Main Street would serve nearly all of these activity centers (see Table 4–2). Significant differences between the alignments would be:

- Grand Boulevard would directly serve the Sprint Center and would better serve the Government District.
- Main Street would directly serve KCATA's 10th and Main Transit Plaza, which is the most important transfer location in downtown, and would better serve the Convention Center and Kauffman Center for the Performing Arts.

Providing direct service to the 10th and Main Transit Plaza and better service to the Convention service is considered a reasonable trade-off for less convenient service to the Government District, and thus, for this criteria, the Main Street alignment was rated as preferable.

4.3.1.3 Walking Times to and from Activity Centers

As part of the Connect criteria, walking times were also considered. As with the number of activity centers served, walking time differences would be between alignments and not modes. Generally, activity centers on the western side of the study area would be better served by the Main Street alternatives and activity centers on the eastern side of the study area would be better served by the Grand Boulevard alternatives.

As with activity centers, the most significant difference between alternatives is that Main Street would directly serve the 10th and Main Transit Plaza and more special event and visitor activity at the Convention Center and the Kauffman Center for the Performing Arts, while Grand Boulevard would directly serve the Sprint Center and would offer better service to the Government District. (see Table 4–2). In both cases, each alignment directly serves six activity centers. Alternatives operating along Grand Boulevard are within a 10-minute walk from nine of the remaining 10 activity centers, while alternatives on Main Street are within a 10 minute walk of eight of the remaining 10 activity centers. As a result, when considering the walking times to and from the Activity Centers, there is no clear difference between the alternatives.

Table 4–2: Number of Activity Centers Served by Proposed Stations Associated with each Tier 2 Alternative

Station:	No Build	Enhanced Bus Grand	Streetcar Grand	Enhanced Bus Main	Streetcar Main
3rd and Grand	n/a	2	2	2	2
River Market City Market	n/a	2	2	2	2
River Market West	n/a			1	1
North Loop	n/a	1	1	1	1
Financial District	n/a			1	1
Financial District South Govt District	n/a	4	4	4	4
Convention Ctr/P&L Sprint Ctr/P&L	n/a	5	5	3	3
Kauffman Ctr Crossroads North	n/a	2	2	3	3
Crossroads	n/a	0	0	1	1
Freighthouse Crossroads South	n/a	1	1	1	1
Crown Center	n/a	2	2	2	2
Union Station	n/a	4	3	3	3
Number of Activity Centers Served*:	n/a	12	11	10	10

** Note: Columns do not sum to the total because station influence areas overlap.*

Table 4–3: Walking Times to/from Major Activity Centers (in minutes)
From Stops Associated with the Tier 2 Alternatives

Nearest stop to:	No Build	Enhanced Bus Grand	Streetcar Grand	Enhanced Bus Main	Streetcar Main
River Market	n/a	directly served	directly served	directly served	directly served
3rd& Grand	n/a	directly served	directly served	directly served	directly served
10th& Main Transit Center	n/a	4	4	directly served	directly served
Convention Center	n/a	6	6	3	3
Kauffman Center	n/a	8	8	5	5
Power and Light	n/a	directly served	directly served	directly served	directly served
Sprint Center	n/a	directly served	directly served	3	3
Bolling Federal Building	n/a	5	5	9	9
County Courthouse	n/a	4	4	8	8
State Office Building	n/a	6	6	11	11
City Hall	n/a	3	3	6	6
Greyhound Station	n/a	13	13	16	16
Freight House	n/a	6	6	3	3
Union Station	n/a	directly served	2	directly served	directly served
IRS Building	n/a	4	5	6	6
Crown Center	n/a	directly served	directly served	directly served	directly served

4.3.1.4 Improve Pedestrian and Bicycle Environment

Walking Environment

The walking environment was evaluated by using the five pedestrian level of service (LOS) measures developed as part of the Kansas City Walkability Plan. The LOS measures were subsequently evaluated according to five sub-segments, or districts, within each corridor: Union Station/Crown Center; Crossroads Arts District; Power & Light District; Financial District/North Loop and River Market. The results of this evaluation suggest that the walking environment to and from all alternatives would generally be good, and there is no significant difference between Grand Boulevard and Main Street alternatives:

- **Directness** - The directness of the pedestrian network in each district on each corridor was rated as good because each area has a grid network within one-quarter mile of the proposed corridors and transit stations.
- **Continuity** - Both corridors feature a complete sidewalk system along the proposed routes, with only a few minor sidewalk gaps in the system, which are nearly always off the corridors on side streets. For this reason, both corridors generally received good ratings, although some sub-segments received a lesser rating of fair. On both corridors, the Crossroads Arts District has more maintenance issues with cracked, broken, and overgrown sidewalks compared to other districts. The maintenance issues, as well as more numerous ADA issues in this district, led to a rating of fair. The one rating that differed in this category between the two corridors was within the Financial District/North Loop. This district rated Main Street as good, but rated Grand Avenue as fair due to more numerous ADA and maintenance issues.
- **Street Crossings** - Street crossings along each corridor were generally rated as fair. The widths and crossings distances along the two corridors are similar, although Main Street is slightly narrower through much of its length. Both corridors provide similar pedestrian features, including marked crosswalks, countdown pedestrian signals, and curb ramps. Street crossings were assessed as fair in most districts because while features are provided to help pedestrians cross the street, there is room for improvement in many locations. The district with the most complete street crossings is the Power & Light District. The Crossroads Arts District along the Grand Boulevard corridor received a rating of poor because there are two signalized intersections without pedestrian signals and more curb ramp issues. This compares with Main Street corridor, which was rated fair.
- **Visual Interest and Amenities** - Although the aesthetic appearance of the pedestrian facilities along the two corridors are generally rated as fair, the ratings within the various districts range from good in the Union Station/Crown Center, Power & Light, and River Market Districts, to fair in the Financial District/North Loop, to poor in the Crossroads Arts District. Both corridors provide similar levels of lighting, landscaping, and maintenance, and no rating distinction was judged between the two corridors in each district.
- **Security -** Security along the two corridors was generally judged to be good, based on available lighting, and generally unobstructed lines of sight. Further, on-street parking provides sufficient separation from traffic. Again, no distinction was observed for this category between the Main and Grand corridors for each of the districts.

Bicycling Environment

The bicycling environment was evaluated based on the overall roadway conditions for cyclists and the availability of bicycle parking. Bicycling conditions to and from all alternatives would also be similar:

- **Bicycling Conditions** - The current bicycling environments along the two corridors are very similar, both in terms of the traffic and roadway characteristics. No designated or exclusive bicycle facilities are currently available on either corridor or any of the cross-streets. Although the current configurations of the two corridors would likely only attract experienced, confident cyclists, the current environment is fair for bicycling. The multi-lane configurations in particular make it easier for motorists to pass cyclists, even those that are controlling a lane. Due to the similarities of conditions and characteristics on the two corridors, no distinction can be made between the bicycling environment and connections along the two corridors.
- **Bicycle Parking Facilities –** The supply and quality of existing bicycle parking is a considered a good indicator of the overall bicycle friendliness of the corridor. Unfortunately, bicycle parking facilities are generally sparse to non-existent along much of the two corridors, and neither corridor was clearly better than the other in any of the districts. As such, the overall rating for both corridors is poor, although the districts within the loop were marginally better at a rating of fair.

4.3.2 DEVELOP: Support Local and Regional Economic Development Goals

For the Develop category, the Tier 2 evaluation considered the ability of each alternative to support five major criteria:

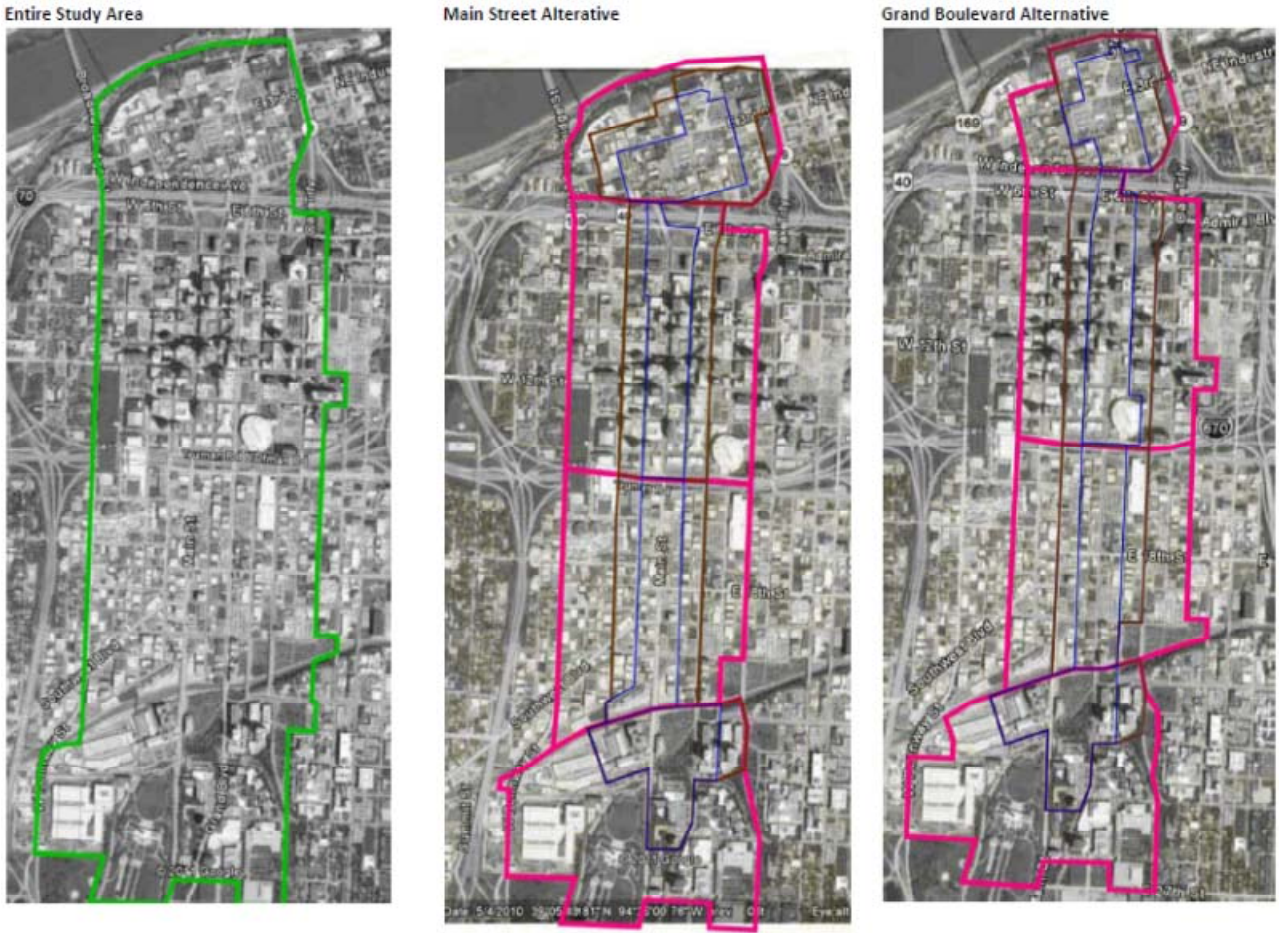
- Existing conditions and current growth trends
- Capacity for future growth
- Economic development potential
- Comparison of maximum projected increases in market value in next 15 years
- Qualitative assessment of downtown real estate market and economic development potential

A critical baseline factor assumed in the economic development evaluation is the notion that streetcar service offers significantly more potential to attract and stimulate development as compared with enhanced bus or a no build scenario. This assumption reflects national experience with other services, which demonstrate that enhanced bus (or bus rapid transit) have not generated the same kind of economic development that streetcar or fixed-guideway transit has achieved. This experience has persisted even when enhanced bus was developed with a dedicated bus lane and significant investment in technology. In the case of streetcar or fixed-guideway systems, the evidence from cities such as Portland (Oregon), Seattle and Tacoma (Washington) and Little Rock (Arkansas) show there is a clear documented increase in development and property values surrounding the service. As a result, the analysis of economic development potential focuses on the corridors, rather than modes, based on the assumption that the No Build and TSM (Enhanced Bus) alternatives would not generate substantial economic development impacts over the base case.

A factor that distinguishes the Tier 2 analysis from the work done in the Tier 1 screening is the distinction between conditions at varying distances from the alignment. Whereas the Tier 1 analysis assumed a ¼ buffer around the alignments, the Tier 2 economic development evaluation based its evaluation on three different zones: the area directly on the alignment and within one block of the corridor, the area within two blocks of the corridor and the area within three blocks. These areas are

shown on Figure 4-1. A streetcar is likely to have a larger impact on the parcels that are directly on the alignment than the parcels farther away. These influence area attempt to capture the varying levels of influence.

Figure 4-1: Economic Assessment Analysis Areas



Evaluation of these criteria shows a strong preference for streetcar over enhanced bus, and a preference for Main Street over Grand Boulevard. Main Street's stronger showing reflects higher recent growth rates and higher corridor values.

4.3.2.1 Existing Conditions and Current Growth Trends

Methods used to assess existing conditions and growth trends included examining the existing zoning; reviewing existing activity; and evaluating growth trends associated with population, employment and housing.

- **Existing Zoning** - Zoning for the two corridors is the same. Both alignments serve four main areas within the downtown: River Market, the downtown loop, Crossroads, and the Crown Center/Union Station area; each of these four areas is currently zoned for mixed use. In addition, the downtown loop and Crown Center area being zoned as "Downtown Core" and the River Market and Crossroads are being zoned as "Downtown Mixed-Use." The "Downtown Core" zoning definition is intended to

promote high-intensity office and employment growth, recognizing that the area is a hub for businesses, communications, retail, cultural, visitor accommodations, and entertainment uses while also accommodating residential development. "Downtown Mixed-Use" zoning is intended to accommodate a large variety of uses from office to institutional to residential, while promoting a mix of land uses.

- **Existing Activity and Growth Trends** – The Main Street alignment would serve more of the existing residential population and economic activity centers than the Grand Boulevard alignment would. As shown in Table 4–4, Main Street exceeds Grand Boulevard by 10% or more in many of the key past- and present-day variables (i.e. population and employment), whereas Grand Boulevard outperforms Main Street by 10% or more for only one of the key variables: non-residential commercial space growth over the past ten years.

Table 4–4: Comparisons of Existing Conditions and Current Growth Trends

	Study Area(1)	Main Street (1)	Grand Blvd. (1)	Preference to: (2)	
				Main	Grand
Existing Conditions: 2010					
Population (Census 2010)	***4,609***	**4,596**	**3,628**	**1**	**0**
Within 2 blocks		3,130	2,216		
Housing Units (Census 2010)	***3,880***	**3,867**	**3,061**	**1**	**0**
Within 2 blocks		2,663	1,804		
Employees (TAZ 2005)	***65,602***	**52,320**	**50,056**	**0**	**0**
Within 2 blocks		27,220	25,880		
Hotel Rooms		**3,474**	**2,469**	**1**	**0**
Within 2 blocks		2,469	1,460		
Venues - Annual Attendance	**5.7 million**	**5.7 million**	**3.3 million**	**1**	**0**
Number	14	14	11		
Retail Sales (within 1 block)		**$93 million**	**$97 million**	**0**	**0**
Eating and Drinking Only		29 million	29 million		
Market Value	**$1880 million**	**$1590 million**	**$1570 million**	**0**	**0**
Within 1 block		*490 million*	*390 million*		
Within 2 blocks		*890 million*	*770 million*		
Growth Trends: 2000 - 2010					
Population Growth (from Census)	**3,017**	**3,123**	**2,737**	**1**	**0**
Per year	*302*	*312*	*274*		
Housing Units (Census 2010)	**2,513**	**2,513**	**2,174**		
(Project List)	**3,200**	**3,200**	**2,369**	**1**	**0**
Per year	*251 to 320*	*251 to 320*	*217 to 237*		
Non Residential Growth (sf) (Project List)	**1,467,207**	**1,281,752**	**1,467,207**	**0**	**1**
Per year	*146,721*	*128,175*	*146,721*		
Growth Projections (TAZ 2005-2040)					
Employment	**32,369**	**30,784**	**31,380**	**0**	**0**
Per year	*925*	*880*	*897*		
Households	**6,263**	**5,935**	**4,851**	**1**	**0**
Per year	*179*	*170*	*139*		
Number of Times Line is Better by 10% or More based on the Variable (1)				**7**	**1**
Notes: (1) Study area as shown on Figure 4-1					
(2) Compares the variable being measured between the two lines. If one line exceeds the other by 10% or more it gets a 1; otherwise a 0. Sums all the Ones at bottom of page.					

With respect to growth trends, Main Street might be the better choice in the event that the presence of transit (whether BRT or streetcar) does not result in a shift in future growth patterns

within the downtown area in general.[6] This is because, over the past ten years, total added residential development in the Main Street alignment has exceeded development added in the Grand Boulevard influence area by 35%. This significantly outweighs the amount of added non-residential commercial development, which, while favoring Grand Boulevard by 15%, accounts for a much smaller incremental addition of square footage and value, less than half of the residential base total.

- Consequently, from the perspective of these criteria, although the zoning does not favor one alternative or another, existing conditions and growth trends suggest the Main Streetcar Alternative would support more development and redevelopment.

4.3.2.2 Projections of Medium Term Capacity for Growth

Both alignments were examined to understand the potential for future development and to see if potential development along either alignment would be greater than capacity limits in the near future. Two types of sites were considered: vacant or underutilized sites, which includes parcels with no building, a very small building on a large parcel; and/or vacant buildings.

Using very conservative calculations[7], both alignments offer very similar capacity for future development (see Table 4–5) – approximately triple current residential capacity and a more than 50 percent increase in non-residential capacity.[8] The most aggressive absorption scenario imaginable is a doubling of the annual rate of residential building along a given corridor relative to growth in the past ten years. Even under these conditions, there is enough available capacity to last at least thirteen years at the current, relatively modest, build-out densities. Long before this capacity constraint were to be reached, developers would build at an increased density that still meets the zoning regulations. This would significantly extend the build-out life of the given corridor. Additionally, the zoning for the areas along the alignments is for mixed use, so sites that would otherwise be assumed to be allocated for one use could be used for another use. Given these conditions, neither alignment seems to suggest any particular advantage from the build out capacity viewpoint.

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[6] Use of various economic incentives and development tools (such as public sites and tax increment financing, Historic and Low Income Tax Credits, tax abatement, etc.) have been major factors in influencing the level and location of downtown development over the past decade. The "highest" end projections assume that these tools would continue to be available.

[7] In calculating "medium term" build out capacity (i.e. next 15 to 30+/years) it is assumed that some percentage of parcels potentially available for development (e.g. vacant or underutilized lots) will not, in fact be available over that time period, due to any number of factors such as existing legal agreements, size, use, etc. In addition, when significant unused capacity exists (as it will in early years at least) and the market is soft, many parcels can be expected to build out at substantially less than their theoretical legally allowed zoning capacity, due to the lesser cost of stick construction and use of surface parking or simple decks in a low-land-value scenario (relative to incremental construction costs for the more dense construction). As parcels begin to build out, prices rise, more parcels come on the market, and build-out tends to occur at higher densities, extending the time period until true build-out is actually approached. In fact, in very few US downtowns is true build-out ever reached.

Table 4–5: Projection of Medium Term Development Capacity of Streetcar Alternatives

	Main Street		Grand Blvd.	
	Residential (Units)	*Non-Res (SF)*	*Residential (Units)*	*Non-Res (SF)*
Development Capacity- "Medium Term"	**8,474**	**6,561,368**	**8,451**	**6,297,955**
"Baseline" Capture Rates: (annual	320	128,175	240	146,721
Moderate:				
Average Annual Absorption	384	134,584	288	154,057
Years to Absorb:	**22**	**49**	**29**	**41**
High:				
Average Annual Absorption	640	166,628	480	190,737
Years to Absorb:	**13**	**39**	**18**	**33**

a. **Moderate** = residential development that is equal to 120% of average per year of last 10 years in the corridor; and employment that is 105% of that average.

b. **High** = residential development that is equal to 200% of average per year of last 10 years in the corridor; and employment that is 130% of that average. This number is quite aggressive and should assume the continuance of many of the existing economic development incentives and tools, at least in the first 5 + years until the trend proves itself.

4.3.2.3 Projection of Upside Economic Development Potential Over First 15 Years

The Tier 2 evaluation also considered the economic development potential associated with each alternative and alignment. The estimated potential shown (see Table 4–6) compares the maximum likely "add" to total market value (in 2010 uninflated dollars) of all non-governmental and non-institutional property within each of the two alignments over the 15 years after a streetcar is fully funded and commences construction. In this case, only the streetcar is considered because, as discussed, there is no statistical, or justifiable anecdotal evidence, that BRT significantly accelerates property development or property values in the corridors or locations with which it might be associated.

Table 4–6: Comparison of Maximum Projected Increases in Market Value in Next 15 Years for Streetcar Alternatives; not BRT

	Study Area	Main Street	Grand Ave
Existing Conditions: 2010			
Market Value	**$1880 million**	**$1590 million**	**$1570 million**
Economic Development Potential (Calculated)			
Maximum Upside Value Added Projection: (15 Years) (1)			
Value Added by Baseline Growth		$769 million	$690 million
Value Added by Streetcar Induced Growth and Premium at 3% on 1st 2 blocks		$593 million	$482 million
Total Value Added in 15 Years		**$1362 million**	**$1172 million**

Notes:

(1) Estimate of maximum potential upside results under extremely favorable assumptions: first , that annual baseline economic growth over next 15 years equals the average achieved in the past decade - so "baseline growth" applies past annual absorption rates to housing at $100,000/unit and non residential at $150/sf. added to the existing market base (net increase over existing land values). Second, maximum growth induced by streetcar (within the streetcar influence zone) is the "high" absorption scenario increment shown in Table 4-5 times the unit prices; plus a one time average 3% assumed increase in the market value of all property within 2 blocks of the streetcar line . (This value "bump up" would probably occur

The **streetcar maximum "value" added scenario** would include the sum of value added by continuation of existing "baseline growth" (the annual rate of development over the past ten years), plus the maximum assumed additional growth projected to be induced by streetcar in the given corridor, plus a one-time three percent increase in the value of all property in the given corridor. The increase in property value would be due to the addition of the transportation investment and proximity benefits of the streetcar, as seen in comparison cities, and would typically be realized over approximately three to seven years after the commencement of construction on the line. Applying the highest projected growth assumptions equally to each corridor, a streetcar could potentially add up to $110 million more in value and development in the Main Street corridor than in the Grand Boulevard corridor, as shown in Table 4–6. The amounts projected to be induced by streetcar range from a 70% addition over and above baseline development in Grand Boulevard corridor to a 77% addition over baseline growth in the Main Street Corridor.

4.3.2.4 Qualitative Factors

A series of interviews were conducted with downtown real-estate and economic-development stakeholders. These stakeholders are from public, quasi-public and private entities and are active in the downtown real-estate development market. The purpose of the interviews was to gain a better understanding of the primary market dynamics within the downtown area, and to discuss how enhanced transit might factor into the equation. While the stakeholders provided various insights, a few key points were made by most or all of the interviewees. These key points are briefly summarized below according to three main categories. It is important to note that the summary below is a compendium of opinions of those interviewed and may or may not be consistent with the overall findings of this report.

A. The performance and outlook for various market sectors within downtown:

1) Residential development has increased significantly in downtown over the past decade. Adaptive re-use of existing buildings has accounted for most of this development and nearly all projects have received some sort of subsidy, most notably through the use of historic preservation tax credits. Development has occurred primarily in the central and western corridors. While the for sale (condominium) market has largely disappeared, there remains some demand for rental residential units. Tight credit markets are making it difficult for new projects to meet this demand.

2) The downtown office market is very challenging. Vacancy rates are high and it will be several years before this supply is absorbed. Consequently, downtown rents are being driven low by the competition for a very limited pool of tenants. Additionally, competition with suburban markets, particularly those in Kansas where significant state incentives are being offered, is drawing office users away from downtown. Kansas City, MO has not been able to match the incentives offered in Kansas. With the possible exception of the occasional single-tenant, build-to-suit project, new office development in downtown is highly unlikely in the near term.

3) Retail and entertainment uses have significantly increased in the downtown area. The Power and Light District and Sprint Center are the major components of this trend. These projects and other smaller projects have changed the perception of downtown and made it more of a destination. Despite some success with these developments, an additional downtown population base is needed to add additional and more varied retail.

4) The downtown hotel market is also struggling with high room vacancy rates. This is in part due to national economic conditions limiting travel, but also due to a major decrease in conventions within downtown over the past decade. Additional hotel rooms would be needed to compete for more conventions, but the existing struggles and tight credit markets make this a difficult proposition.

5) The cost of providing parking (generally structured) negatively affects the feasibility of projects downtown.

B. The potential role of enhanced transit such as streetcar in the downtown market:

1) Streetcar service would make residential development more attractive, but would not significantly reduce the level of subsidy required for new projects.

2) Similarly, retail uses could benefit from the increased mobility offered by streetcar, but it does not seem that streetcar itself would significantly increase the level of retail development. More residents are needed downtown for more retail.

3) Streetcar service is not likely to have a significant effect on the office market.

4) Streetcar service could potentially benefit the visitor/entertainment/hotel market the most, but it is unclear if it would be enough to significantly improve the level of activity in these sectors.

C. The relative merit of the Main Street and Grand Avenue alignments:

1) In general, the interviewees believed that either alignment could work, that both were attractive options and that the overall differences between the two potential alignments were slight.

2) Nonetheless, there was a general perception that Main Street had more overall support and was the slightly better option.

3) More specific comments that were commonly mentioned:
   a) The Main Street alignment was seen as having significant development momentum already and therefore some believed the project would have a stronger positive impact along Grand Avenue.
   b) Grand Avenue could present the easier option from a constructability and cost perspective due to its greater width.
   c) The Grand Avenue line was seen as problematic due to:
      i. Opposition by the Cordish Group to the project going by their front door
      ii. Complications with the need to close Grand Avenue for various major events throughout the year.
      iii. The greater distance from the convention center and hotels along Wyandotte Street.
   d) Grand Avenue was seen as presenting more development sites within the Loop while Main presented more opportunities in other areas along the alignment.

4.3.3 THRIVE: Strengthen Downtown Districts and Urban Centers

This objective aims to support existing residential and employment centers as well as support visitor and special event activities using the following three criteria:

- Connections with existing residential and employment centers
- Support for visitor and special event activities
- Public and stakeholder support and/or opposition

In most categories, in terms of alignment, there was either little difference between Grand Boulevard or Main Street or Main Street performed better, and in terms of mode, streetcar would perform better than enhanced bus.

4.3.3.1 Support Existing Residential and Employment Centers

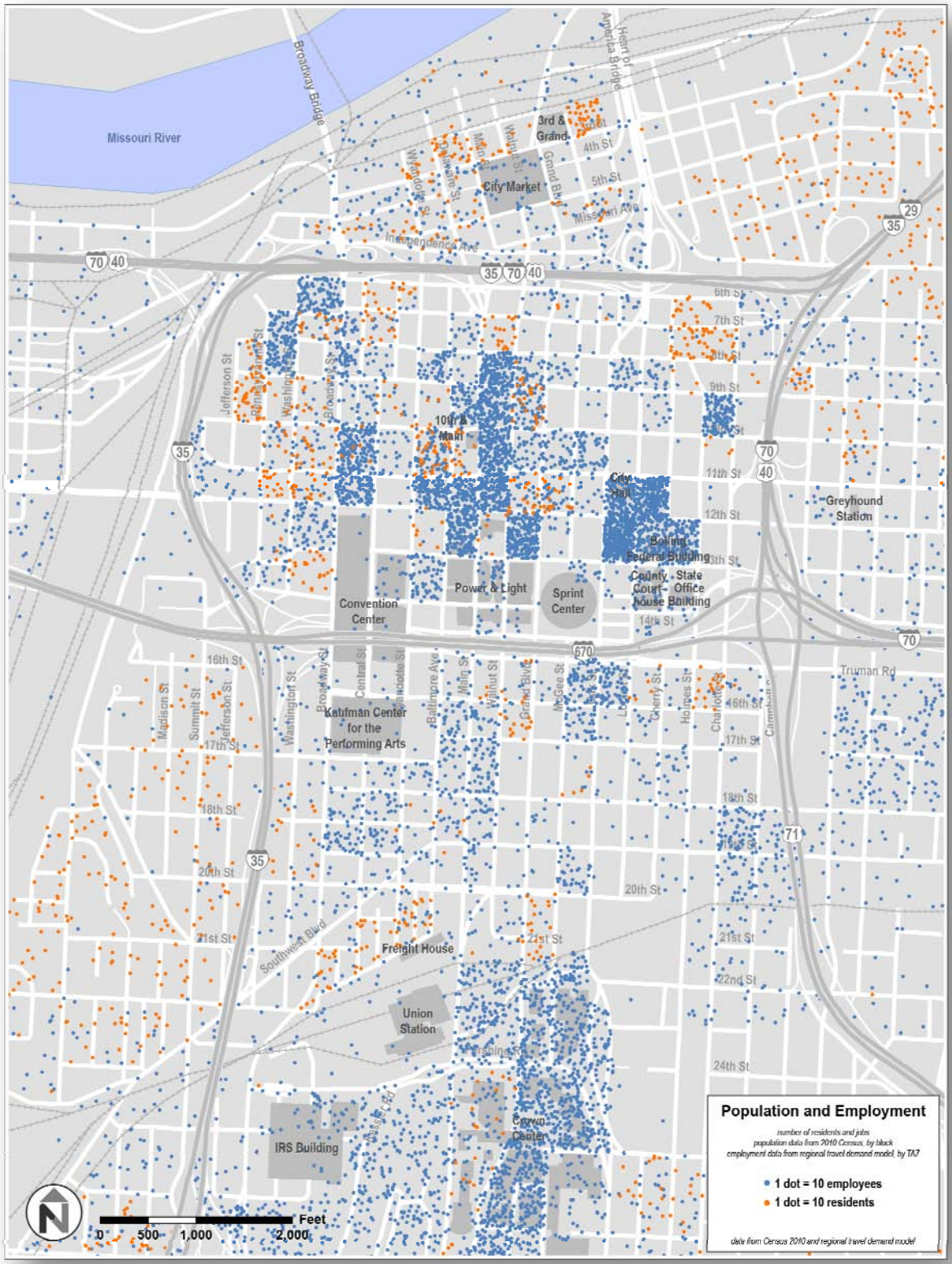
To understand each alternative's ability to support residential and employment centers, the alternatives were evaluated based on the number of people who live and work within ¼ mile of one or more of the proposed stations. The alternatives compare very similarly; however, there are some differences between the modes and alignments (see Table 4–7 and Figure 4-2). The difference between modes is an increase in the population served by the Enhanced Bus on Grand Boulevard Alternative. This increase is a function of how the bus would be routed through Union Station at the southern end of the alignment– by circulating through Union Station, the bus is accessible by the residential neighborhoods in the Freight House district.

The differences between Grand Boulevard and Main Street are consistent with previous analyses: Grand Boulevard serves more employment but less population and fewer households. This finding reflects the fact that Grand Boulevard is closer to the Government District and Main Street serves the population clusters on the western side of the study area. In summary, the alternative with the greatest potential is Grand Boulevard Enhanced Bus.

Table 4–7: Population and Employment Within ¼ mile of Tier 2 Alternative Stations

Population and Employment within ¼ Mile of Stations	No Build	Enhanced Bus Grand	Streetcar Grand	Enhanced Bus Main	Streetcar Main
Employees	n/a	50,853	50,853	47,150	47,150
Population	n/a	4,063	3,720	4,405	4,405
Households	n/a	2,907	2,677	3,211	3,211

Figure 4-2: Population and Employment Distribution in the Downtown Corridor Study Area



4.3.3.2 Support Visitor and Special Event Activities

Tourism and business visitor activity comprises an important part of the downtown corridor's economy, thus the ability of a new transit circulator to support travel to and from hotels and special event venues is an important evaluation criteria. The evaluation process considered the accessibility of each alternative to hotels, hotel rooms, and special event venues; attendance at those venues shows there is no difference between modes, but there is a difference between alignments (see Table 4–8). Most of the differences between alignments results from Main Street's proximity to the Convention Center and related hotels as well as the Kaufman Center for Performing Arts. Consequently, even though the Sprint Center is situated on Grand Boulevard, the Grand alignment is not within a ¼ mile of several hotels and special event venues, thus the two Main Street alternatives (bus and streetcar) outperform the No Build and Grand Boulevard alternatives.

Table 4–8: Activity Levels by Tier 2 Alternative

Activity Levels	No Build	Enhanced Bus Grand	Streetcar Grand	Enhanced Bus Main	Streetcar Main
Major Hotels	n/a	6	6	8	8
Hotel Rooms	n/a	2,469	2,469	3,474	3,474
Special Event Venues	n/a	4	4	6	6
Annual Attendance[1]	n/a	3.3 million	3.3 million	5.7 million	5.7 million

[1] *The annual attendance figures consider a wider range of venues than just those considered special event venues in order to get a better comparison between the alternatives.*

4.3.3.3 Public and Stakeholder Input

Prior to September 2011, two public open houses had been held to discuss the Corridor Alternatives Analysis. The first was held on June 21, 2011 and comments received as part of that meeting were incorporated into the Tier 1 screening process. The second, a public open house and "Streetcar Party", was held on August 31, 2011. The open house provided information about the AA process, Tier 1 screening process and ongoing work being conducted as part of the Tier 2 evaluation. The Streetcar Party offered members of the public a "sneak peak" of physical examples of the type of the streetcar and bus alternatives under consideration. Both a Kinkisharyo ameriTRAM and MAX bus were on display for members of the public to tour and view.

Comments received as part of the August open house and Streetcar Party form the basis of the Public and Stakeholder Input show the following major themes:

- There was overwhelming support for Streetcar over Enhanced Bus
- Most liked the simplicity of both the alignments
- Development stakeholders feel short-term market consisted of residents, downtown visitors and guests, and that Main Street would better serve those populations
- Main Street received more numerous and vocal support
- Grand Boulevard received significant opposition from some key stakeholders, largely with the respect to potential impacts due to Grand Boulevard street closures for special events.

As measured against the public and stakeholder input criteria, the Main Street Streetcar was preferred.

4.3.4 SUSTAIN: Create an Environment that will be Sustainable over the Long Term

This goal aims to create a transit corridor that will become a vibrant, active area. Accordingly, the study team evaluated each alternative based on the following objectives:

- Potential to improve the effectiveness and efficiency of existing transit service as measured by ridership, operating and capital costs, user benefits and cost effectiveness
- Transit reliability
- Impact on structure and surface parking
- Impacts on utility systems
- The potential to attract diverse set of private and public sector funding
- Impacts on natural and historic resources

There are several critical criteria evaluated under this goal, some of which favor Main Street Streetcar (ridership and transit reliability), some of which favor Grand Boulevard (utility impacts) and one that favors enhanced bus (capital costs). Considering all criteria together produces a preference for the Main Street streetcar.

4.3.4.1 Potential to Improve the Effectiveness and Efficiency of Existing Transit Service

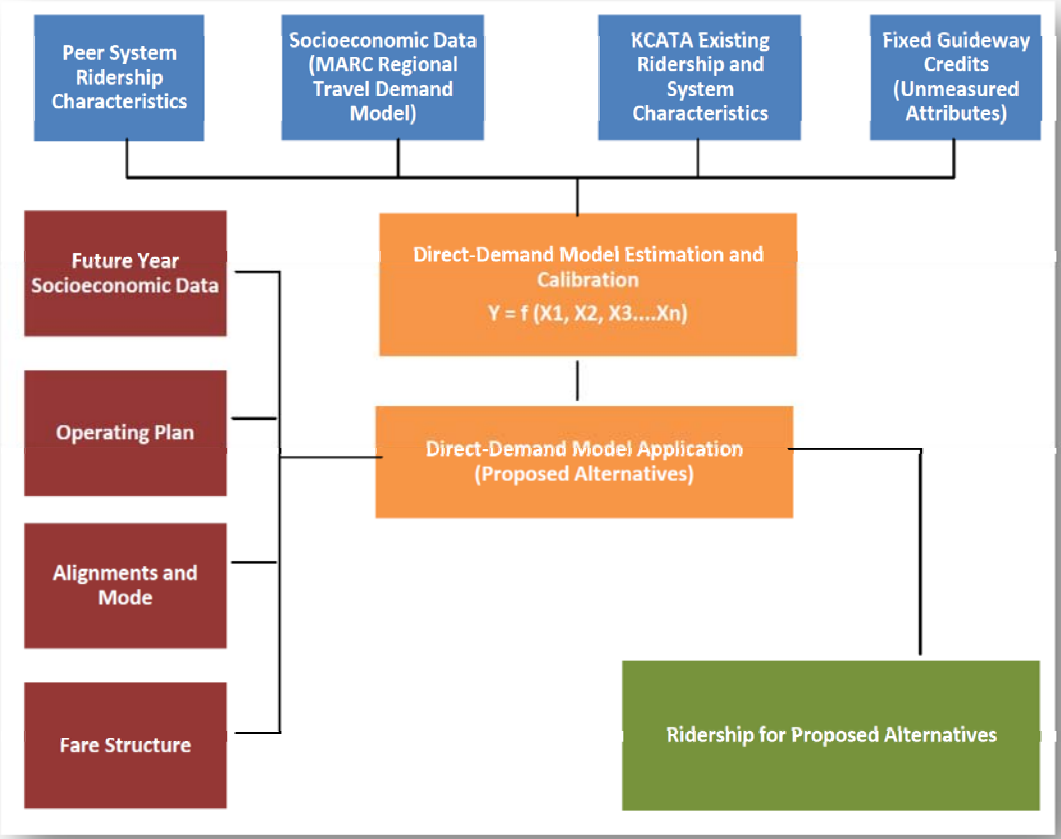
Ridership

Understanding the number of riders each of the alternatives would attract was an essential evaluation criteria. Ridership estimates were also used to understand user benefits and system cost-effectiveness.

Transit ridership for a given route depends on various factors including socio-economic characteristics, site conditions, transit supply variables, stop locations, etc. For this project, a sketch-level direct-demand model was developed that used multivariate regression analysis based on existing ridership data obtained from KCATA and socioeconomic data extracted from the Mid-America Regional Council (MARC) regional travel demand model. Peer system ridership characteristics and fixed guideway credits associated with unmeasured variables were also utilized to develop mode-specific coefficients. Figure 4-3 shows the overall model development and application process. The resulting model then predicted ridership as a function of population, employment, and hotel-motel rooms within a quarter mile of the project alignment.

Ridership projections for both 2015 (opening year) and 2035 (forecast year) indicate that ridership for the streetcar alternatives would be significantly higher than enhanced bus ridership, and that Main Street would generate higher ridership than Grand Boulevard (see Table 4–9). These findings are consistent across scenarios that were developed to reflect different assumptions about land use and economic activity. In the opening year (2015), the ridership forecasts show the streetcar would attract more than twice as many riders as the Enhanced Bus service; this trend continues to 2035. Among the two streetcar alternatives, the Main Street Streetcar is expected to carry 9% more riders in than opening year and 10% more in the forecast year as compared with the Grand Boulevard alternative.

Figure 4-3-Overview of the Direct Demand Modeling Methodology



The ridership forecasts are considered conservative because event-related ridership was not adequately captured in this analysis. While the service design parameters assumed that the proposed transit services would serve a large event-related market, this market was not estimated due to the lack of readily available data. Several private charter and shuttle buses currently serve the event patrons traveling between hotels and venues, and ridership could be substantially higher depending on how these event related transit services are reconfigured with the project in place.

Table 4–9: Opening Year (2015) and Horizon Year (2035) Daily Ridership for Tier 2 Alternatives

Daily Ridership:	No Build	Enhanced Bus Grand	Streetcar Grand	Enhanced Bus Main	Streetcar Main
Opening Year (2015)	n/a	1,183	2,662	1,287	2,896
Forecast Year (2035)	n/a	2,465	5,547	2,677	6,023
Scenario Analysis[1]					
Moderate Growth	n/a	2,442	5,655	2,681	6,220
High Growth	n/a	—	6,271	—	6,928

[1] *Economic activity scenarios reflect assumed growth in economic activity resulting from implementation of the new transit system. Thus, the streetcar alternatives will experience additional growth in ridership due to the assumed impact of the streetcar on development patterns.*

4.3.4.2 Annual Operating Costs

Operating costs for downtown corridor services would be related to the mode of service operated and the amount of service provided. At any given level of service, streetcar service is inherently more expensive to operate than bus service, largely due to higher infrastructure (tracks and power system) and vehicle maintenance costs. However, in many cases, because streetcars have higher capacities and shorter dwell times than buses, less service is required, and this can offset the higher unit operating costs.

At the present time, only three other cities (Portland, Seattle, and Tacoma) operate modern streetcar service, with costs per revenue vehicle hour (RVH) ranging from $175 to $386. These costs are 43% to 128% higher than for regular bus service. In cities that operate historic streetcars, streetcar costs are generally 35% to 50% higher than for regular bus service. With the exception of Tacoma, these differentials are similar as for modern streetcar service.

KCATA's operating cost structure is significantly lower than those in Portland, Seattle, and Tacoma. In 2009, KCATA had operating costs of $104 per revenue vehicle hour. This compares to 2009/2010 bus operating costs in Portland, Seattle, and Tacoma of $123, $146, and $169. With KCATA's lower operating cost structure, the cost of Kansas City streetcar service would also be lower, and based on the streetcar/bus differentials in Portland and Seattle, the expected 2009 costs would be approximately $150 per revenue vehicle hour. Assuming 3.5% inflation per year, expected operating costs in 2015, which is when service would be projected to begin, would be $184 per revenue vehicle hour. Enhanced bus operating costs would be similar to KCATA's current costs for MAX service, which would be approximately $127 per revenue vehicle hour in 2015.

Streetcar service could be provided with three vehicles, whereas enhanced bus service would require four vehicles. This would be because longer bus dwell times, largely for wheelchair boardings and alightings and the loading of and unloading of bicycles with front-mounted bike racks) would increase running times to the extent that 10 minute (or 11 minute) service would require four buses.

On this basis, 2015 operating costs for either streetcar alternative would be $3.19 million per year (see Table 4–10), versus $2.95 million per year for the two enhanced bus alternatives. The differential would be relatively low, because as described above, four buses would be in service at most times for Enhanced Bus service, versus three streetcars for streetcar service.

Table 4–10: Operating Assumptions and Cost Estimates for Tier 2 Alternatives

	No Build	Enhanced Bus Grand	Streetcar Grand	Enhanced Bus Main	Streetcar Main
Service Frequencies					
Monday–Thursday					
6 AM - 9 PM	n/a	10	10	10	11
9 PM - 12 AM	n/a	20	20	20	22
Friday and Saturday					
6 AM - 2 AM	n/a	10	10	10	11
Sundays					
8 AM - 9 PM	n/a	20	20	20	22
Peak Vehicle Requirement	n/a	4	3	4	3
Vehicle Service Hours					
Monday–Thursday	n/a	66	50	66	50
Friday and Saturday	n/a	80	60	80	60
Sunday	n/a	26	20	26	20
Annual	n/a	23,160	17,370	23,160	17,370
Annual Operating Costs					
2011	n/a	$2,572,202	$2,777,978	$2,572,202	$2,777,978
Unit Costs (OC/RVH)[1]		$111	$160	$111	$160
2015	n/a	$2,951,661	$3,187,793	$2,951,661	$3,187,793
Unit Costs (OC/RVH)[1]		$127	$184	$127	$184

[1] *Operating Costs (OC) per Revenue Vehicle Hours (RVH) (RVH = Vehicle Service Hours)*

4.3.4.3 Capital Costs

Capital cost estimates were developed at a level of detail necessary to accurately compare alternatives and establish a baseline project budget. Broadly speaking, this means that the estimates reflect a conceptual level of engineering and technical evaluation of the potential alignments. The analysis also considers historic streetcar project costs on similar type projects. These costs were adjusted, as necessary, to be relative to the bidding market in Kansas City versus the source project (primarily Portland, the most recent streetcar project constructed). The estimates include quantifiable items with unit costs as well as allowances for anticipated items that do not have sufficient detail to quantify at this time. The estimates include all projects costs including construction, right of way, vehicles, professional services (soft costs), allocated and unallocated contingencies and inflation. Combined, these project costs make up the total project cost as viewed by FTA and are established using the FTA Standard Cost Categories (SCC) workbook.

Not surprisingly, streetcar service would be significantly more expensive than Enhanced Bus, at $101 to $102 million versus $18 to $20 million (in 2015 dollars) (see Table 4–11). The large difference in costs would be largely attributable to costs for tracks, the power supply system, and vehicles.

Among the enhanced bus alternatives, Grand Boulevard is projected to cost approximately $2.7 million less in capital costs than Main Street. The difference is due to numerous factors, the most significant being the greater number of stops and amount of site work along Main Street. The Grand Boulevard alignment would have 19 stops total (9 one-way stops in each direction and one bi-directional stop at

Union Station), while the Main Street alignment would have 12 one-way stops in each direction, for a total of 24 stops. This difference would increase construction costs by about $725,000, and the costs of the fare collection system by about $414,000. The Main Street alternative would also require greater allowances for pedestrian improvements, streetscaping, and roadway improvements since there are more intersections along Main Street. Greater allowances were also made along Main Street for modifying existing traffic signals, installing new pedestrian traffic signals, and allowing for signal priority as well.

The capital costs for the streetcar would be $101 million for the Main Street alternative and $102 million for the Grand Boulevard alternative. The Main Street alignment is slightly longer; therefore, the alternative would incur additional costs associated with more track; the alignment assumptions also include extra stops. However, the Grand Boulevard alternative would require additional systems development, and the final analysis shows both alternatives as having very similar costs.

Table 4–11: Capital Cost Estimates for Tier 2 Alternatives

Costs in Dollars ($)	No Build	Enhanced Bus Grand	Streetcar Grand	Enhanced Bus Main	Streetcar Main
Guideway and Track Elements	0	0	10,946,000	0	12,296,000
Stations, Stops, Terminals, Intermodal	0	3,086,000	2,593,000	3,811,000	3,215,500
Support Facilities	0	0	8,972,000	0	8,972,000
Site work & Special Conditions	0	3,737,000	14,242,000	4,198,000	14,137,000
Systems	0	2,979,000	16,907,000	3,695,000	14,396,000
Construction Subtotal	0	9,802,000	53,660,000	11,703,000	53,017,000
ROW, Land, Existing Improvements	0	0	2,714,000	0	2,714,000
Vehicles	0	3,215,000	19,535,000	3,215,000	19,535,000
Professional Services	0	3,032,000	16,704,000	3,620,000	16,475,000
Non-Construction Subtotal	0	16,049,00	92,613,000	18,538,000	91,741,000
Unallocated Contingency	0	1,605,000	9,261,000	1,854,000	9,174,000
Total	0	17,654,000	101,875,000	20,392,000	100,915,500

Note: All costs in $2015.
Source: HDR, 2011

4.3.4.4 Transit Cos- Effectiveness and Efficiency

The streetcar alternatives would be more expensive to construct and operate, but they would carry many more passengers reflecting both higher ridership forecasts and greater vehicle capacity. As a result, in terms of operating cost per passenger and passengers per revenue vehicle hour, in the forecast year, streetcar service would be more effective (see Table 4–12). In the forecast year, the Main Street Streetcar Alternative would be marginally more cost effective than the Grand Boulevard Streetcar Alternative for both operating cost per passenger and passengers per revenue hour.

The operating cost per passenger (measured in 2011 dollars) show that the streetcar alternatives cost $3.30 to $3.60, compared to $6.90 to $7.50 for enhanced bus. In 2035, with large projected increases in streetcar ridership, the costs would be $1.50 to $1.65 for streetcar services versus $3.20 to $3.50 for enhanced bus. Passenger per revenue vehicle hour differentials would be similarly large. In 2015, streetcar service would carry 45 to 50 passengers per revenue hour versus 15 on enhanced bus. In 2035, streetcar service would carry between 100 and 110 passengers per vehicle hour versus 30 to 35 on Enhanced Bus.

Table 4–12: Cost Effectiveness Measures

Cost Effectiveness Measures	No Build	Enhanced Bus Grand	Streetcar Grand	Enhanced Bus Main	Streetcar Main
Ridership (Annual)					
2015	n/a	343,000	775,000	374,000	845,000
2035 (Moderate Growth Scenario)	n/a	733,000	1,697,000	804,000	1,866,000
Operating Costs (Annual; $2011)	n/a	$2.6 m	$2.8 m	$ 2.6 m	$2.8 m
Vehicle Revenue Hours (Annual)	n/a	23,160	17,370	23,160	17,370
Capital Costs ($2011)	n/a	$16.7m	$95.0m	$19.3m	$95.0m
Operating Cost/Passenger ($2011)					
2015	n/a	$7.50	$3.60	$6.90	$3.30
2035	n/a	$3.50	$1.60	$3.20	$1.50
Passengers/Revenue Hour					
2015	n/a	15	45	15	50
2035	n/a	30	100	35	110

4.3.4.5 Reliability

Another important evaluation criteria is the ability of the alternatives to provide dependable, relatable service. One of the most significant differences between alignments would be the impact of street closures on service operations. There are currently 21 full or partial day street closures on Grand Avenue related to events at the Sprint Center, Crown Center, and other events (see Table 4–13). These street closures are viewed at critical to business interests at the Sprint Center, Crown Center, and the Power and Light District, but disrupt transit service on the corridor. By contrast, there are no street closures on Main Street.

Enhanced bus service on Grand Boulevard would be able to easily detour around Grand Boulevard street closures (as is the case with existing bus service on Grand Boulevard). However, this would not be the case with streetcar service, and a major disadvantage with Grand Boulevard streetcar service would be that either streetcar service would need to disrupt special event-related street closures or the street closures would disrupt streetcar service.

Table 4–13: Street Closures by Tier 2 Alternative

Annual Summertime Street Closures	No Build	Enhanced Bus Grand	Streetcar Grand	Enhanced Bus Main	Streetcar Main
Partial Day	n/a	5	5	0	0
Full Day	n/a	16	16	0	0
Total	n/a	21	21	0	0

4.3.4.6 Convert Surface Parking to Higher Value Uses

The Tier 2 screening process also considered the potential of each alternative in terms of being able to convert surface parking to higher-value land uses. The differences between modes are captured in the economic development analysis (see Develop criteria), which suggest that the streetcar service would offer a considerable advantage in terms of stimulating development as compared with enhanced bus.

Differences would also be found between the two alignments. Both alignments have a significant amount of surface and structured parking, providing significant opportunities for converting parking into higher value uses (see Table 4–14). In terms of the amount of surface parking with in a ¼ mile of each station, the differences between alignments and modes is not great, with a range from 155.9 acres (Grand Boulevard Enhanced Bus) to 158.2 (Main Street Streetcar).

Table 4–14: Surface and Structured Parking by Alternative

Acres of Parking Within ¼ mile of Stations	No Build	Enhanced Bus on Grand	Streetcar on Grand	Enhanced Bus on Main	Streetcar on Main
Surface	n/a	109.7	108.1	105.0	105.0
Structured	n/a	47.8	47.8	53.2	53.2
Total	n/a	157.4	155.9	158.2	158.2

4.3.4.7 Utility Impacts

The number and location of utilities could greatly impact costs associated with building a fixed-guideway system in downtown Kansas City; therefore, broadly assessing potential impact is a major consideration of the evaluation. In the case of this study, utility impacts would primarily be associated with streetcar rather than the enhanced bus or no build options. The focus of the utility impact evaluation, therefore, is assessing the differences associated with development on Grand Boulevard as compared with Main Street. The data supporting the evaluation include a combination of information from the City of Kansas City, Missouri together with information supplied by private utility companies. It includes water, sanitary sewer, storm sewer, combined sanitary and storm sewer, gas, steam/chilled water, electric and communications. While AT&T and Verizon/MCI did not provide documentation of the location of their utility lines, they did provide rankings of the alternatives. This information was included in the evaluation process.

Grand Boulevard has the least amount of utility impacts associated with storm sewer, communication lines and steam/chilled water. Main Street, on the other hand, has fewer water, sanitary sewer and gas utility impacts, but a very high impact on communication lines. These impacts are associated with a large duct line that contains numerous communication lines for multiple companies. As a result, the Grand Boulevard Streetcar Alternative would have fewer utility impacts as compared with the Main Street Streetcar Alternative.

4.3.4.8 Provide Sustainable Funding for Corridor Improvements and Operations

A common thread that has run through stakeholder and civic leader discussions on financing is the belief that the finance plan must be downtown-focused rather than imposed over the City. Most stakeholders generally believe that a downtown circulator constructed employing a fixed-guideway (such as embedded rails) will not merely provide beneficial transit impact, but also will provide a sense of permanence that will lead to significant investment and reinvestment in the vicinity of the fixed-

guideway system. Stakeholders and civic leaders understand that any new system will likely need to be funded substantially (if not wholly) by newly created revenue, so that existing levels of transit service, and the funding thereof, are not diminished or otherwise adversely affected. Finally, all parties generally agree that aggressive efforts will need to be undertaken at the appropriate time to secure one or more Federal contributions to defray the costs of the project. On this basis, a number of guiding principles for project financing were developed:

- No dedicated city-wide sales or property tax
- Fixed rail system creates "permanence" that spurs investment
- No diversion of KCATA funding
- Maximize opportunities for Federal contribution

In order to create new funding sources that are downtown-focused, it is anticipated that the project will be constructed and financed under the auspices of a Missouri Transportation Development District, or "TDD", formed pursuant to the Missouri Transportation Development District Act, § 238.200, et seq., RSMo (the "Act"). A TDD is a distinct entity operating as a political subdivision of the State, governed by a Board of Directors. A TDD has the statutory power to establish (after the approval of a majority vote of the qualified voters within the TDD) several sources of revenue within the boundaries (and only within the boundaries) of the TDD.

The current strategy being considered is that stakeholders would be asked to agree to the formation of a TDD with boundaries that cover much of the downtown core. The specific boundaries remain subject to refinement, but initial thoughts are that the district would run (generally) from the Missouri River on the north to either Pershing Road or 27th Street on the south, and then from the centerline of Broadway on the west to the centerline of Locust on the east.

Of the various revenue sources that can be established by a TDD, the most expedient and reliable (reliability being important to the capital markets that will be asked to accept these anticipated bonds) would be (1) a district-wide (but only district-wide) sales tax, and (2) special assessments on property within the district (but only within the district). The project could also receive revenue from rider fares as well as advertising on vehicles and even perhaps permanent "naming rights" for vehicles.

4.3.4.9 Minimize/Mitigate Impacts on Natural and Historic Resources: Improve Air Quality

Based on an early, reconnaissance-level identification of issues related to environmental compliance, no significant environmental issues have been identified for any of the alternatives. Note that while this review followed the checklist for a Documented Categorical Exclusion (DCE) environmental action, it is not intended to be a DCE. This assessment included (see also Table 4–15):

- Location and Zoning - All alternatives would be compliant with existing local zoning and planning. Revision to land-use and development plans, polices and codes could enhance the success of the transit investment.
- Traffic and Parking - Main Street and Grand Boulevard are the main north-south arterial streets within the study corridor. They are spine roads serving the heart of the Kansas City central business district. They also intersect with numerous important east-west streets over the two-mile study corridor.

- **Streetcar:** Overall, based on the current traffic volumes in both corridors, it appears that there is sufficient capacity to support the addition of the streetcar in either corridor. If parking adjustments were made such that only two lanes are available in both directions on the street to be served by the streetcar, then placing the streetcar on Main Street would be preferred as it has lower current and projected future volumes. However, if parking is to be removed from Grand Boulevard, then that street could better accommodate the streetcar from a roadway capacity standpoint. Conversely, that removal of parking would potentially affect a number of businesses and downtown residents/visitors.
- **Enhanced Bus:** The enhanced bus option would not require changes to all parking spaces along a block, but it would require adjustments that facilitate fast, high-frequency operations and clear stop locations. It is not anticipated that the enhanced bus option would negatively affect either corridor in a substantial manner.

- Aesthetics - Project features would be designed to fit within the existing streetscape and urban environment. The project design would need to be sensitive to the character of the streetscape and the general urban environment in the project area. In this case, most design elements would fit within the existing environment. However, streetcar service could require an overhead catenary system, which may be viewed as an undesirable visual feature by some parties.
- Air Quality - Generally, relatively small projects such as a streetcar or enhanced bus service do not have a significant effect on air quality or greenhouse gases, *but* they can contribute to lower VMT, which can contribute to small improvements in local and regional air quality.
- Coastal Zone - Study area is not in or near a designated coastal zone management area.
- Hazardous Materials - The 2009 Light Rail Transit (LRT) Alternatives Analysis included a complete database search of state and Federal environmental records (over 20 databases and lists) as well as a review of Sanborn Fire Insurance Maps. The current study corridor is quite similar to the proposed 2009 LRT corridors in the downtown area. Both considered Main Street and Grand Avenue as possible routes. Therefore, it is expected that the six High and Medium priority sites identified for the downtown area for the 2009 study would apply to directly to the current evaluation. Of the identified sites, three are along or in the vicinity of Grand and one is on Main Street (see Table 4–15).

  For the enhanced bus alternatives, very little construction will be required (e.g. shelters and signs). Therefore, it should be possible to avoid the sites referenced above and/or implement the project without hazardous waste site impacts.

Table 4–15: Comparison of Environmental and Historic Impacts for Tier 2 Alternatives

Environmental Measure:	No Build	Enhanced Bus on Grand	Streetcar on Grand	Enhanced Bus on Main	Streetcar on Main
Visual/Aesthetics	n/a	No catenary system	Overhead catenary system added to corridor. Catenary system may result in greater visual impact due to higher number of NRHP-eligible properties (see historic and cultural)	No catenary system	Overhead catenary system added to corridor
Air Quality	n/a	Operation emissions - diesel engines would contribute emissions (CO, NOx, SOx, VOCs, PM). Construction emissions – fugitive dust and equipment (CO, NOx, SOx, VOCs, PM)	Operation emissions - electric engines would contribute no emissions. Construction emissions – fugitive dust and equipment (CO, NOx, SOx, VOCs, PM)	Operation emissions - diesel engines would contribute emissions (CO, NOx, SOx, VOCs, PM). Construction emissions – fugitive dust and equipment (CO, NOx, SOx, VOCs, PM) Due to existing constrained roadway capacity, may require hot spot analyses at major intersections.	Operation emissions - electric engines would contribute no emissions. Construction emissions – fugitive dust and equipment (CO, NOx, SOx, VOCs, PM) Due to existing constrained roadway capacity, may require hot spot analyses at major intersections.
Noise and Vibration	n/a	Noise from buses would be similar to existing bus operations	Noise from Streetcar operations would be generally similar to trucks and buses operating in the streets Noise analysis would be necessary where there are sensitive receptors along the route such as Residential uses.	Noise from buses would be similar to existing bus operations	Noise from Streetcar operations would be generally similar to trucks and buses operating in the streets Noise analysis would be necessary where there are sensitive receptors along the route such as Residential uses.
Historic and Cultural	n/a	19 NRHP-listed properties 27 NRHP-eligible properties	19 NRHP-listed properties 27 NRHP-eligible properties	19 NRHP-listed properties 13 NRHP-eligible properties	19 NRHP-listed properties 13 NRHP-eligible properties

Environmental Measure:	No Build	Enhanced Bus on Grand	Streetcar on Grand	Enhanced Bus on Main	Streetcar on Main
Parks (& Section 4(f)/6(f))	n/a	1 park 1 trail crossing 4 KCPRD pkwy/blvds (including Grand) No 6(f) properties	1 park 1 trail crossing 4 KCPRD pkwy/blvds (including Grand) No 6(f) properties	1 park 2 fountains 1 trail crossing 2 KCPRD pkwy/blvds No 6(f) properties	1 park 2 fountains 1 trail crossing 2 KCPRD pkwy/blvds No 6(f) properties
Natural Resources	n/a	same	same	same	same
Biological Resources	n/a			Peregrine falcon nest, Commerce Tower	Peregrine falcon nest, Commerce Tower
Water Quality	n/a	same	same	same	same
Construction	n/a	There would be limited construction of new transit facilities with the bus alternatives	Construction of new trackway, stops, maintenance facility and related improvements. Construction would be almost exclusively within the street right-of-way Construction effects would be temporary and could take approximately 2 years overall, but could be much shorter in any single location. Key construction effects would be to traffic, parking and access to uses adjacent to the improvements.	There would be limited construction of new transit facilities with the bus alternatives	Construction of new trackway, stops, maintenance facility and related improvements. Construction would be almost exclusively within the street right-of-way. Construction effects would be temporary and could take approximately 2 years overall, but could be shorter in any single location. Key construction effects would be to traffic, parking and access to uses adjacent to the improvements.

For the streetcar alternatives, the construction will include shallow excavation to install the rails as well as stations, signage, and the required power lines. Most if not all of this construction is expected to occur within the existing public right-of-way. Therefore, it should still be possible to avoid the sites listed above and/or implement the project without hazardous waste site impacts.

Based on the available information, it does not appear that there are any major hazardous-materials-related obstacles to implementing enhanced bus or streetcar service on either Main Street or Grand. The small number of sites, with the distribution noted, also does not indicate that one street alignment should be substantially preferred over the over with respect to hazardous materials.

Table 4–16: Locations with Potential Hazardous Materials

Location	Name	Priority	Description (quoted from 2009 LRT Study)
3920 Main Street	NA - Spill Site	High	"The site is listed as a Spill site. According to the EDR database report, a tenant at the site reported a petroleum fluid seeping through cracks in the building foundation. The fire department believed the fluid was fuel oil from an unknown Underground Storage Tank (UST). A test of the fluid indicated that the material may be solvents from a former on-site dry cleaner. No other actions were reported for the site."
Grand Ave. and 18th St. (Sanborn Map Year 1963)	Filling station with gasoline tanks	High	" … it is likely a majority of the noted USTs have been removed. However, due to the age of the sites, UST design standards pre-dating the late 1980s, and the lack of significant environmental regulation prior to the late 1960s, it is likely that many of the USTs had releases and the impacted soils and groundwater were not remediated following removal of the USTs. Petroleum products that may have been released at these historical sites has likely attenuated to a degree, but without further investigation, the level attenuation and impact is not known."
100 feet south of Grand Ave. and 20th St. (Sanborn Map Year 1963)	Filling station with gasoline tanks	High	

Source: Compiled by HDR Engineering, Inc. from 2009 Light Rail Transit Alternatives Analysis, Kansas City Area Transportation Authority (KCATA)

- Navigable Waterways - While the Missouri River is less than 1,500 feet from potential northern termini of the project alternatives, none are considered close enough to impact the waterway.
- Noise and Vibration - Noise and vibration effects from buses on either Main Street or Grand Avenue would be similar to what exists today with the operations of the MAX and other buses in the study area. Noise and vibration effects from streetcars would be relatively similar to the effects of existing buses and trucks in the area. In addition, it has generally been found that vibration is not a significant issue related to operations of a streetcar project unless there is a particularly sensitive building or function along the alignment and in close proximity to the trackway. Potentially sensitive receptors along the routes have not yet been specifically identified, but could include residences and performance venues located very close to the tracks. Construction of project improvements would likely include both noise and vibration that would be short term and temporary in nature.

- Prime and Unique Farmlands - None of the alternatives, which are all located in or near downtown Kansas City, Missouri, involve the use of any prime or unique farmlands.
- Biological and Natural Resources - Due to the built-up urban environment of the study area, minimal to no impacts to natural and biological resources are anticipated.
- Cultural and Historic - There are a number of NRHP-listed and NRHP-eligible structures within the study area, and any structure or other potential historic resource over 50 years of age could be eligible for protection under city, state, and federal historic preservation regulations. Because historically, streetcars were instrumental in the development of downtown Kansas City, reintroduction of modern streetcars would not generally be incompatible with the area.
- Parklands - None of the alternatives would have a direct impact on any parks. However, the Kansas City Parks and Recreation Department (KCPRD) has jurisdiction over Grand Boulevard. As a result, any transit improvements along Grand Boulevard would need to be coordinated with KCRPD.
- Seismic - There are no known seismic conditions associated with the alternatives. However, all projects would be designed to applicable seismic standards.
- Water Quality and Hydrology - No water quality or hydrology impacts were identified. However, because the Study Area is located within the Turkey Creek/Central Industrial District Basin identified in the 2010 Consent Decree (which prescribes sewer improvements the City will make over the next 25 years) , green infrastructure solutions as well as construction best management practices (BMPs) would need to be identified for the selected alternative and required for implementation as part of the project design.
- Construction Impacts - The effects of construction would vary, depending on the selected project. If either of the bus alternatives were selected, there would be limited new construction in the study area for project improvements. If either of the streetcar alternatives were selected, there would be short-term construction in the study area including the trackway, stops, power substations, overhead centenary, a maintenance facility and related improvements. Construction would generally be within the street right-of-way, and would take approximately 2 years from the beginning of construction to operations. Construction methods could be employed that would limit construction in any one location to a much shorter period. Primary effects of construction would be to traffic, parking, and access in the vicinity of the project improvements. Access to adjacent uses could be maintained to all uses during construction.

  Construction of the project would generate local jobs during the construction period and could provide economic benefits to businesses that support the construction efforts. Conversely, temporary construction activities can disrupt business operations in the vicinity of the construction area.

- Property Acquisition - Generally, none of the alternatives will require the acquisition of property. However, some of the alternatives involving the streetcar mode may require the acquisition of property for a vehicle maintenance and storage facility. Most of the sites under consideration are publicly owned.

4.3.5 Summary of the Tier 2 Evaluation

Overall, the Tier 2 evaluation identified the Main Street streetcar as the strongest candidate for the LPA. While several criteria showed no measurable difference between alternatives, there were several criteria where either the Main Street alignment and/or the streetcar option demonstrated considerable advantages over the other alternative or mode. The criteria that largely influenced the local review and agency preferences include the connections to the activity centers, the economic development potential, public and stakeholder input, and service effectiveness as shown in Table 4–17.

Table 4–17: Summary of Evaluation Results of the Primary Criteria for the Tier 2 Alignments and Modes

Primary Criteria	Strongest Alignment	Strongest Mode
Activity Center Connections	Main Street	None
Activity Levels	None	None
Pedestrian and Bicycle Connections	None	None
Economic Development Activity	None	None
Economic Development Potential	Main Street	Streetcar
Residential and Employment Activity	Main Street	Streetcar
Transit Reliability	Main Street	None
Public and Stakeholder Input	Main Street	Streetcar
Ridership	Main Street	Streetcar
Capital Costs	None	Enhanced Bus
Service Effectiveness	Main Street	Streetcar
Environmental and Natural Resources	None	None
Note: this table shows a summary of the Tier 2 evaluation. Refer to the text of section 4.3 for additional details.		

5. Public Involvement

When the downtown corridor alternatives analysis study began in early 2011, one of the early efforts was to develop a Public Participation Plan[9]. The plan was developed and executed by the Partnership team with consultant assistance from the HDR consultant team, and specifically Patti Banks Associates. The purpose of the plan was to provide a framework from which to guide the public participation process for the downtown corridor AA.

5.1 Overview of Public Involvement Program

The public participation effort was based on the belief that people whose lives would be affected by planning and investment decisions have a right to be involved in the decision-making process and influence choices that are made. The public participation program was designed to be a proactive process in which the governing bodies worked to engage the affected public in a variety of opportunities to become involved, and included a meaningful and transparent process that ensured effective communication about how public participation would influence the decisions.

The partnership team was fully committed to a public participation process that:

- Involved the public in decisions that could affect their lives
- Ensured that the public's contribution would influence the decision-making
- Communicated how the public's contribution would influence decisions
- Was adaptable and sensitive to diverse audiences
- Promoted respect
- Provided equal access to opportunities, information and education
- Was consistent and reliable
- Promoted continued engagement
- Allowed for flexibility and use of creative approaches
- Maintained honesty and integrity throughout the process
- Encouraged early and active participation
- Involved process evaluation and monitoring tools

During the study, the public outreach effort included three open houses, scheduled around key milestones. They were planned to provide information to the public about the study, gather feedback on the study and Locally Preferred Alternative decision, gain input on the financing strategies considered for the project, and inform the public and decision-makers about the community issues and concerns. The three open houses were generally planned and scheduled as follows:

[9] KC Downtown Corridor Alternatives Analysis: Public Participation Plan, May 2011

- The first open house was to share with the public the early draft materials and receive feedback from the public on:
  - Draft goals and objectives,
  - Draft purpose and need,
  - Preliminary list of alignment options for Tier 1 Analysis.
- The second open house was planned to share the early results of the Tier 1 screening of alignment options
- The third open house was planned to share the early results of the Tier 2 screening of the Enhanced Bus and Streetcar Alternatives.

MARC hosted a project web site located on the www.kcsmartmoves.org web page for the downtown corridor alternatives analysis materials. The web site was regularly updated with the most current study materials, invitations to the study's open houses, etc. The Project Team also distributed a series of media kits throughout the duration of the project. The kits included fact sheets, media releases, display adds, Frequently Asked Questions, and a list of Partnership Team contacts to provide updates on key milestones. In addition, e-mail blasts were used to share study information, such as open house notices, and summaries of public input, along with other key milestone information. Social Media was also employed to reach out to the public.

5.2 Summary of Public Feedback

As described above, the public outreach process included a variety of methods to engage the public in the study. The following section summarizes the outreach efforts and feedback received.

5.2.1 Public Open House #1

This open house was held on **June 21, 2011** from **4:00 to 6:30 PM at the Central Branch of the Kansas City Public Library** at 14 W 10th Street in Kansas City. Two short and identical presentations were given at 4:30 and 5:30.

Notice of the open house was provided via press release, www.smartmoves.org email blast, bus bulletin, Facebook, and stakeholder meeting announcements.

A total of 113 people attended the open house in addition to project team members. Attendees included local public officials and staff; downtown residents; business representatives; neighborhood groups; umbrella agencies; advocacy groups; and

television, print and radio news media.

The purpose of the meeting was to provide targeted stakeholder groups and the general public and media with an overview of the downtown corridor AA as well as to:

- Share information about:
  - How the AA differs from previous studies
  - The planning process and Schedule for the AA
  - Differences between transit modes, such as the modern streetcar and circulator bus
  - Alignment options for the potential fixed-guideway starter line
  - Eventual development of a Locally Preferred Alternative (LPA) and general financing strategies.
- Gather feedback on:
  - Draft Goals and Objectives
  - Draft Purpose and Need
  - Preferred alignments
  - Preferred modes

Handouts provided to meeting participants included:

- Meeting Overview
- Project Fact Sheet
- Project Comment Form
- Meeting Evaluation Form

Exhibits at the meeting included:

- Welcome: Relevant meeting information
- Overview: Project description
- Process and Schedule: General project details
- Project Purpose and Need: Purpose and need statement
- Modes of Transit: Circulator bus and modern streetcar comparison
- How to Pay for If: Guiding principles and potential sources of funding
- Next Steps: Planning process activities for July – September 2011
- Stay Informed: www.smartmoves.org

General Summary of Comments received:

Fifty (50) hardcopy and 14 electronic comment cards were returned to the project team plus other comments received in a variety of ways, e.g. by email, phone, or letter, during the weeks that followed the open house. Generally, the feedback received related to:

- Improve transit downtown:
  - For visitors, residents, and workers alike
  - Due to issues with the current bus system (general and MAX), e.g. timing/scheduling, confusing routes
  - Better connect destinations
  - Improve convenience
  - Decrease dependence on the automobile
  - Improve the urban core and spur development
  - Help Kansas City compete with other cities
- Agreement on the purpose and need statement, noting that the starter line could:
  - Trigger economic development and encourage infill
  - Support continual growth downtown
  - Represent permanent downtown investment
  - Create better transit connections and circulation, particularly for short trips
  - Be the beginning of fixed-guideway transit in Kansas City
  - Support tourism
- Interest in the modern streetcar because it would:
  - Use permanent rails
  - Be a predictable, fixed-route circulator
  - Have a positive connotation/perception
  - Offer an easy riding experience
  - Demonstrate permanence of investment
- Interest in all of the alignment alternatives
  - Most comments focused on Main Street and the Main Street/Walnut couplet and other provided alternatives, but one respondent suggested that Wyandotte Street be studied among the alignment alternatives.
- Other comments
  - Excited about the project.
  - Connections into or through the City Market – Additional detail and presentation requested.

- Potential for expansion and connection with other transit routes
- Integration and accommodation of bicycles with the starter line
- Expanded bus service as a better mode choice than streetcar
- Consideration and accommodations for the Performing Arts and Sprint Centers events and/or activities.
- Request for additional streetcar details, .e.g. operations, hours of service, funding mechanisms, potential rider fares/ticketing, potential ridership, timing for construction, etc.

5.2.2 Public Open House #2

This open house was held on **August 31, 2011** from **8:00 AM to 6:30 PM in the Grand Hall of Union Station** (30 West Pershing Road) in Kansas City. No formal presentations were given. The open house was held in conjunction with the Regional Transit Alliance's (RTA's) Streetcar Party from 7 AM to 7 PM at Union Station on the same day to give the public a "sneak peak" at the physical examples of the types of streetcar and bus alternatives under consideration in the downtown corridor AA study.

Notice was provided via press release, www.smartmoves.org email blast, bus bulletin, Facebook, and stakeholder meeting announcements.

Approximately 900 people participated in the Streetcar Party, including nearly 280 who signed in to attend the open house, 300 who toured the Kinkisharyo ameriTRAM vehicle, 160 Regional Transit Alliance raffle participants, and 150 registrants for the transportation-inspired musical performance in addition to project team members. Attendees included local public officials and staff; downtown residents; business representatives; neighborhood groups; umbrella agencies; advocacy groups; and television, print and radio news media.

The purpose of the open house was to provide targeted stakeholder groups and the general public and media with an overview of the downtown Corridor AA as well as to:

- Share information about:
  - Purpose and need for the AA
  - How the AA differs from other efforts
  - Planning process and schedule for the AA
  - Differences between transit modes
  - Tier 1 evaluation of alignment options for a potential fixed-guideway starter line
  - Tier 2 evaluation of the Grand Boulevard and Main Street bus and streetcar alternatives
  - Development of a Locally Preferred Alternative (LPA) and general financing strategies for it.
- Gather feedback on:
  - Tier 2 evaluation criteria that should be considered
  - General comments.

Handouts provided to meeting participants included:

- Meeting Overview
- Project Comment Form
- Meeting Evaluation Form

Exhibits at the meeting included:

- Welcome: Relevant meeting information
- Overview: Project description
- Process and Schedule: General project details
- Project Purpose and Need: Purpose and need statement
- Modes of Transit: Circulator bus and modern streetcar comparison

- June Alignment Alternatives: Maps of the seven alignment options
- Tier 1 Evaluation: Evaluation Criteria and results of the process to narrow the seven alignment options to two.
- August Alignment Alternatives: Grand Boulevard and Main Street
- How to Pay for It: Guiding principles and potential sources of funding
- Next Steps: Planning process activities for July – September 2011
- Stay Informed: www.smartmoves.org

General Summary of Comments received:

Forty-five (45) hardcopy project comment cards and 24 meeting evaluation forms were returned to the project team during the weeks that followed the open house. Generally, the feedback received related to:

- Factors that should be considered during the Tier 2 evaluation:
  - Potential for starter line expansion to: Country Club Plaza, 18th and Vine, Waldo area, North of the River (including the airport) Johnson County, east, etc.
  - Simplicity of alignment, e.g. straight as possible
  - Ability of the working population to access the starter line for work, food/groceries, and other transit connections, e.g. Main Street MAX, potential Main Street Light Rail. Streetcar operation factors may impact the MAX.
  - Ridership generated for working populations
  - Bicycle accommodations
  - Interior streetcar design
  - New development opportunities within the streetcar corridor and beyond
  - Energy efficiency
  - Emergency procedures
  - Ease of construction
  - ADA requirements
  - Park-and-ride potential
  - Advertising ability
  - Tourism
- Funding:
  - How much will the project cost?
  - What are the funding sources?
  - To whom would the assessment be applied?

- What benefits would assessed properties receive?
- Would incentives be offered to businesses?

- Grand Boulevard Alignment:
  - Serves all the centers
  - Connects Jobs
  - Relates to the "making Grand Boulevard Grand" project
  - Is straighter
- Main Street Alignment
  - Connects to grocery, entertainment residential and work locations
  - Is central to downtown
  - Would have parking impacts
- Logistics
  - Where and how to pay for tickets
  - Hours of operation
  - Trip length
  - City Market connections and alignments
- Other
  - Like light rail from Waldo to the KCI Airport
  - Coordinating and informing the rental population about the Project

5.2.3 Public Open House #3

This open house was held on **September 20, 2011** from **4:00 to 6:30 PM** at the **Arabia Steamboat Museum** (400 Grand Boulevard) in Kansas City. No formal presentations were given.

Notice was provided via press release, www.smartmoves.org email blast, bus bulletin, Facebook, and stakeholder meeting announcements.

Forty-nine (49) people attended in addition to project team members. Attendees included local public officials and staff; downtown residents; business representatives; neighborhood groups; umbrella agencies; advocacy groups; and television, print and radio news media.

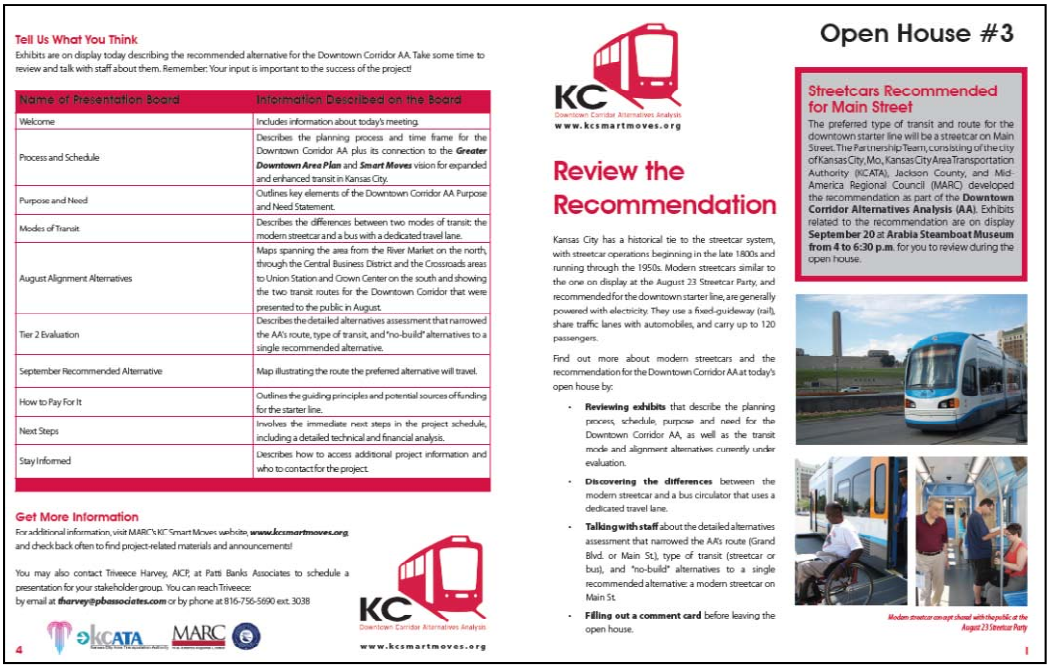
The purpose of the open house was to provide targeted stakeholder groups, the general public and the media with an overview of the recommendation for a preferred mode and route for the downtown starter line as well as to:

- Share information about the:

- Planning process and schedule for the AA
- Detailed Tier 2 evaluation of the Grand Boulevard and Main Street bus and streetcar alternatives
- Alignment and mode recommendations
- General Finance Strategy

♦ Gather feedback on:

- Tier 2 evaluation
- General comments, issues and concerns.



Tell Us What You Think

Exhibits are on display today describing the recommended alternative for the Downtown Corridor AA. Take some time to review and talk with staff about them. Remember: Your input is important to the success of the project!

Name of Presentation Board	Information Described on the Board
Welcome	Includes information about today's meeting.
Process and Schedule	Describes the planning process and time frame for the Downtown Corridor AA plus its connection to the ***Greater Downtown Area Plan*** and ***Smart Moves*** vision for expanded and enhanced transit in Kansas City.
Purpose and Need	Outlines key elements of the Downtown Corridor AA Purpose and Need Statement.
Modes of Transit	Describes the differences between two modes of transit: the modern streetcar and a bus with a dedicated travel lane.
August Alignment Alternatives	Maps spanning the area from the River Market on the north, through the Central Business District and the Crossroads areas to Union Station and Crown Center on the south and showing the two transit routes for the Downtown Corridor that were presented to the public in August.
Tier 2 Evaluation	Describes the detailed alternatives assessment that narrowed the AA's route, type of transit, and "no-build" alternatives to a single recommended alternative.
September Recommended Alternative	Map illustrating the route the preferred alternative will travel.
How to Pay For It	Outlines the guiding principles and potential sources of funding for the starter line.
Next Steps	Involves the immediate next steps in the project schedule, including a detailed technical and financial analysis.
Stay Informed	Describes how to access additional project information and who to contact for the project.

Get More Information

For additional information, visit MARC's KC Smart Moves website, ***www.kcsmartmoves.org*** and check back often to find project-related materials and announcements!

You may also contact Triveece Harvey, AICP, at Patti Banks Associates to schedule a presentation for your stakeholder group. You can reach Triveece:
by email at ***tharvey@pbassociates.com*** or by phone at 816-756-5690 ext. 3038

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KC Downtown Corridor Alternatives Analysis
www.kcsmartmoves.org

Review the Recommendation

Kansas City has a historical tie to the streetcar system, with streetcar operations beginning in the late 1800s and running through the 1950s. Modern streetcars similar to the one on display at the August 23 Streetcar Party, and recommended for the downtown starter line, are generally powered with electricity. They use a fixed-guideway (rail), share traffic lanes with automobiles, and carry up to 120 passengers.

Find out more about modern streetcars and the recommendation for the Downtown Corridor AA at today's open house by:

- **Reviewing exhibits** that describe the planning process, schedule, purpose and need for the Downtown Corridor AA, as well as the transit mode and alignment alternatives currently under evaluation.
- **Discovering the differences** between the modern streetcar and a bus circulator that uses a dedicated travel lane.
- **Talking with staff** about the detailed alternatives assessment that narrowed the AA's route (Grand Blvd. or Main St.), type of transit (streetcar or bus), and "no-build" alternatives to a single recommended alternative: a modern streetcar on Main St.
- **Filling out a comment card** before leaving the open house.

Open House #3

Streetcars Recommended for Main Street

The preferred type of transit and route for the downtown starter line will be a streetcar on Main Street. The Partnership Team, consisting of the city of Kansas City, Mo., Kansas City Area Transportation Authority (KCATA), Jackson County, and Mid-America Regional Council (MARC) developed the recommendation as part of the **Downtown Corridor Alternatives Analysis (AA)**. Exhibits related to the recommendation are on display **September 20** at **Arabia Steamboat Museum from 4 to 6:30 p.m.** for you to review during the open house.

Modern streetcars on display with the public at the August 23 Streetcar Party

1

Handouts provided to meeting participants included:

♦ Meeting Overview

♦ Project Comment Form

♦ Meeting Evaluation Form

Exhibits at the meeting included:

♦ Welcome: Relevant meeting information

♦ Overview: Project description

♦ Process and Schedule: General project details

♦ Project Purpose and Need: Purpose and need statement

- Modes of Transit: Circulator bus and modern streetcar comparison
- August Alignment Alternatives: Grand Boulevard and Main Street
- Tier 2 Evaluation: Detailed assessment that narrowed the AA's route, type of transit.
- September Alignment Alternative: Recommendation to select Main Street Streetcar as the preferred alternative
- How to Pay for It: Guiding principles and potential sources of funding
- Next Steps: Planning process activities for July – September 2011
- Stay Informed: www.smartmoves.org

General Summary of Comments received included:

Seven (7) hardcopy project comment cards and 23 meeting evaluation forms were returned to the project team during the weeks that followed the open house. Generally, the feedback received related to:

- General praise/excitement for the Project
  - Interest in Phase II plans
  - Potential benefits to the community
- Project Concerns
  - 5th Street between Grand Blvd. and Main St. – Road is congested
  - 3rd Street from Grand Blvd to Crown Center – impacts to the Main ST. MAX Bus route
  - Need accommodations for the disabled
  - Coordination with the "making Grand Boulevard Grand" Project
  - Desire for curbside services
  - Desire for stops in the same location as Main St. Max stops
  - Financial strategy includes taxes
  - Integration of the streetcar with the existing transit system
- Other
  - Suggested streetcar frequency simulation for passengers with buses running when the streetcar would operate – public relations opportunity
  - Suggest test run of streetcar route using buses – gather statistical data to confirm that Main St. should move forward as the preferred route.

6. Costs and Finance

This section summarizes the information on the estimated costs and potential financing options for a new transit project in downtown Kansas City. At this very early stage of the project, both the costs and funding options should be considered preliminary, and are most effective for comparison purposes. More firm cost and finance analysis will be needed for the project, and would occur as the project moves forward. More advanced cost estimating would be done as the engineering details advance. The cost and financing will be affected by many decisions and choices that are yet to be made by the local sponsoring agencies.

6.1 Capital Cost Estimates

The project team developed estimates of capital costs for the alternatives evaluated in Tier 2, including the two enhanced bus and two streetcar options on Main Street and Grand Boulevard. These estimates are early order-of-magnitude estimates and should be used at this point primarily for comparative purposes. The estimates are based on a conceptual level of engineering and technical evaluation of the potential alignments.

A summary of the project costs are shown in Table 6–1 and Table 6–2. For detailed assumptions, methodology, etc, the reader is encouraged to refer to the final versions of the Basis of Design, Cost Methodology, Utility memo and Maintenance Facility Reports.

Table 6–1: Estimated Capital Costs for Streetcar Alternatives

	Main Street	Grand Boulevard
Total Project Cost	$101.0 M	$102.3 M
Total Length (Track Miles)	4.1	3.7
Cost per Track Mile	$24.6 M	$27.6 M

Source: KCMO Downtown Circulator AA – Opinion of Probable Costs Summary, HDR, September 16, 2011.

Table 6–2: Estimated Capital Costs for the Enhanced Bus Alternatives

	Main Street	Grand Boulevard
Total Project Cost	$20.4 M	$17.7 M
Total Length (Trip Miles)	4.8	4.4
Cost per Mile	$4.3 M	$4.0 M

Source: KCMO Downtown Circulator AA – Opinion of Probable Costs Summary, HDR, September 16, 2011.

6.2 Operations Cost Estimates

The project team developed estimates of operating and maintenance costs for the alternatives evaluated in Tier 2, including the two enhanced bus and two streetcar options on Main Street and Grand Boulevard. These estimates are early order-of-magnitude estimates and should be used at this point primarily for comparative purposes because estimates are based on a conceptual operating scenario and interface with other existing and planned future transit service.

Operating costs for the Tier 2 Alternatives would be related to the mode of service operated and the amount of service provided. At any given level of service, streetcar service is inherently more expensive to operate than bus service, largely due to higher infrastructure (tracks and power system) and vehicle

maintenance costs. However, in many cases, because streetcars have higher capacities and shorter dwell times than buses, less service is required, and this can offset the higher unit operating costs.

6.2.1 Streetcar and Enhanced Bus Unit Operating Costs

Three other cities (Portland, Seattle, and Tacoma) operate modern streetcar service. The bus and streetcar costs in those cities range from $175 to $386 per revenue vehicle hour (RVH). In cities that operate historic streetcars, streetcar costs are generally 35 to 50% higher than for regular bus service, which with the exception of Tacoma, and these differentials are similar as for modern streetcar service.

Enhanced bus costs would be somewhat higher than costs for regular bus service, as there would be higher maintenance costs for enhanced bus vehicles, station facilities, and bus lanes/queue jump lanes. These costs would be very similar to KCATA's MAX service. For the purposes of these estimates, it was assumed that increases in infrastructure and vehicle maintenance costs would generally be similar to offsets in other areas. On this basis, in 2015, enhanced bus costs, again assuming 3.5% inflation per year, would be $127 per revenue vehicle hour.

Service Levels and Vehicle Requirements

All alternatives were initially assumed to operate in the same manner, which would inlcude:

- **Hours:** Monday through Thursday from 6:00 am to 12:00 midnight; Friday and Saturday from 6:00 am to 2:00 am; Sundays from 8:00 am to 9:00 pm.
- **Frequency:** Monday through Thursday every 10 minutes from 6:00 am to 9:00 pm and every 20 minutes from 9:00 pm to 12:00 midnight; Fridays and Saturdays every 10 minutes throughout the day; Sundays every 20 minutes throughout the day.

However, once operating plans were developed, it was determined that three streetcars could provide 10-minute service frequencies along Grand Boulevard (Streetcar on Grand Alternative), but only every 11 minutes along Main Street (Streetcar on Main Alternative). Since an additional streetcar vehicle would cost more than $4 million and increase operating costs by more than 30%, 10/20 minute streetcar service was assumed for Grand Boulevard and 11/22 minute service was assumed for Main Street.

For Enhanced Bus service, service with both the Main Street and Grand Boulevard alternatives could operate every 10/20 minutes. However, whereas streetcar service could be provided with three vehicles, longer bus dwell times (largely for wheelchair boardings and alightings, and the loading of and unloading of bicycles with front-mounted bike racks) would increase running times to the extent that 10-minute (or 11-minute) service is expected to require four buses.

Annual Operating Costs

Based on the unit costs and service levels described above, 2015 operating costs for either streetcar alternative are estimated at $3.2 million per year (see Table 6–2), with the only difference being that Grand Boulevard Streetcar service would operate every 10/20 minutes, while Main Street Streetcar service would operate every 11/22 minutes.

Table 6–3: Projected Annual Operating Cost Estimates for Tier 2 Alternatives

	Grand Enhanced Bus	Grand Streetcar	Main Enhanced Bus	Main Streetcar
2011	$2,572,202	$2,777,978	$2,572,202	$2,777,978
2014	$2,851,846	$3,079,994	$2,851,846	$3,079,994
2015	$2,951,661	$3,187,793	$2,951,661	$3,187,793

Source: Nelson Nygaard, October 2011

The Enhanced Bus alternatives would both cost approximately 7% less than streetcar service. The differential would be relatively low, because as described above, four buses would be in service at most times for Enhanced Bus service, versus three streetcars for streetcar service. Table 6-3 details the projected operating costs.

Maintenance Facility Cost Estimates

For both of the Streetcar Alternatives, a new maintenance facility would be required. For the Enhanced Bus Alternatives, bus maintenance could be accommodated at or through expansion of an existing bus maintenance facility.

For the **Streetcar Alternatives**, the Capital Cost estimates include an allowance to cover the cost of a maintenance facility building, trackwork and systems and site acquisition. The selection of a site for the maintenance facility has not been done, so the estimate should be considered an allowance, until a site is selected and more detailed design and cost estimates can be prepared. The capital cost allowance estimate for a maintenance facility for both Streetcar Alternatives is **$8.9 million ($2011).**

For the **Enhanced Bus Alternatives**, the Capital Cost estimates include an allowance for expansion of an existing bus facility. The capital cost estimate allowance for maintenance facility expansion for both Enhanced Bus Alternatives is **$150,000.**

6.3 Finance

During this Alternatives Analysis phase, the key task related to finance was to conduct an analysis of financing options to identify sources that could be used to support the locally preferred alternative. Financing options were examined for both Capital (construction) and operations and maintenance. The consultant team, in consultation with the Partnership Team, identified a wide range of potential Finance opportunities on both the local and federal levels that could be used to help fund a project in the Corridor. Private funding options and public-private partnership options were also explored. A candidate list of potential sources for both capital and operating needs was developed and rated for potential success as well as the ability to raise sufficient resources to accomplish the selected project.

The consultant team, in cooperation with the Partnership team, developed a series of guiding principles and a broad-brush approach to financing the costs of the Project. Also, consultation with downtown corridor stakeholders has been a key part of the finance research and development so far. Early efforts led to the identification of a few of Guiding Principles for financing of a downtown project. The guiding principles include:

- No dedicated city-wide sales or property tax
- Fixed rail system creates “permanence” that spurs investment

- No diversion of KCATA funding
- Maximize opportunities for Federal contribution

A common thread that has run through much of the stakeholder and civic leader discussions is the belief that the finance plan for the downtown project must be downtown-focused rather than imposed over the City as a whole in order to be viable. Most generally believe that a downtown circulator constructed employing a fixed guideway (such as embedded rails) will not merely provide beneficial transit impact, but also (importantly) will provide a sense of permanence that will lead to significant investment and reinvestment in the vicinity of the fixed-guideway system. The consultant team, as well as stakeholders and civic leaders, understand that any new system will likely need to be funded substantially (if not wholly) by newly created revenue, so that existing levels of transit service, and the funding thereof, are not diminished or otherwise adversely affected. Finally, all parties generally agreed that aggressive efforts should be undertaken at the appropriate time to secure one or more Federal contributions to support the locally provided finance effort for the Project.

Potential Local Funding Sources

- **Missouri Transportation Development District**, or "TDD", formed pursuant to the Missouri Transportation Development District Act, § § 238.200, *et seq.*, RSMo (the "Act").
- **A District Sales Tax** - A district-wide sales and use tax of approximately one percent.
- **Property Assessments** - Annual special assessments on real property within the TDD based on assessed value.
- **Annual special assessments** on surface commercial surface parking spaces within the TDD.
- **Fares** - rider fares.
- **Advertising revenue** from on-vehicle signage and other advertising opportunities.

Potential Federal Funding Sources

- New Starts, Small Starts and Very Small Starts (FTA Section 5903 Funds).
- Urban Circulator Grants.
- TIGER Grants.
- Other federal appropriations or authorizations.

7. The Locally Preferred Alternative

The purpose of this section is to document the Locally Preferred Alternative (LPA) for the Kansas City downtown corridor. It documents the decision, including mode, alignment, general stop locations, service characteristics, etc; summarizes the analysis leading to the LPA decision; and, provides an overview of the basis for the selection of the LPA.

7.1 The LPA Decision Process

The process of selecting the Locally Preferred Alternative for the downtown corridor included the following steps:

- After reviewing the technical analysis and public input from the Open Houses, the Partnership team made an initial recommendation to the Downtown Parking and Transportation Commission.
- The consultant team presented the Tier 2 evaluation to the Partner ship Team on September 19, 2011, along with a preliminary recommendation for the LPA.
- The Downtown Parking and Transportation Commission held a public meeting on September 20, 2011. After a presentation on the study findings by project staff, and hearing from the public in attendance at the meeting, the commission passed a recommendation to the City Council to select Streetcar as the Mode and Main Street as the alignment for the Locally Preferred Alternative.
- The City Council held an additional public meeting on September 29, 2011 to review the recommendation of the Parking and Transportation Commission. Staff presented the study analysis and findings. An overview of the recommendation from the Downtown Parking and Transportation Commission was presented. Public testimony was received and the City Council accepted and adopted the recommendation from the Parking and Transportation Commission.
- The board of KCATA supported and endorsed the City Council action (when they have taken an action in support of the LPA, explain what their action was and when. Also attach appropriate documentation, such as a resolution or motion…)
- The MARC Board supported the City Council Action by… (when they have taken an action in support of the LPA, explain what their action was and when. Also attach appropriate documentation, such as a resolution or motion…)
- The Board of Commissioners from Jackson County, Missouri… (when they have taken an action in support of the LPA, explain what their action was and when. Also attach appropriate documentation, such as a resolution or motion…)

7.2 LPA Project Description

The selected LPA is a modern streetcar service operating between River Market and Crown Center in downtown Kansas City via Main Street. Following is a brief description of the LPA. Further definition and refinement of the LPA will occur in subsequent steps of the project development process.

7.2.1 Mode

The modern streetcar is the recommended transit mode for the downtown corridor. This mode best meets the project's Purpose and Needs and the goals and objectives as outlined in Chapter 2. The streetcar mode had the most significant public and stakeholder support, as demonstrated in Chapter 5.

7.2.2 Alignment

The recommended alignment for the downtown corridor is the Main Street Alternative and is shown on Figure 7-1. This alignment best meets the project's Purpose and Need Statement, and the goals and objectives as outlines in Chapter 2. This alignment also had the most significant public and stakeholder support, as noted in Chapter 5.

The length of the alignment is approximately 2.11 miles. The northern terminus of the alignment is the intersection of 3rd Street and Grand Boulevard. The southern terminus of the alignment is the intersection of Grand Boulevard and Pershing Road. The alignment segments from north to south are as follows:

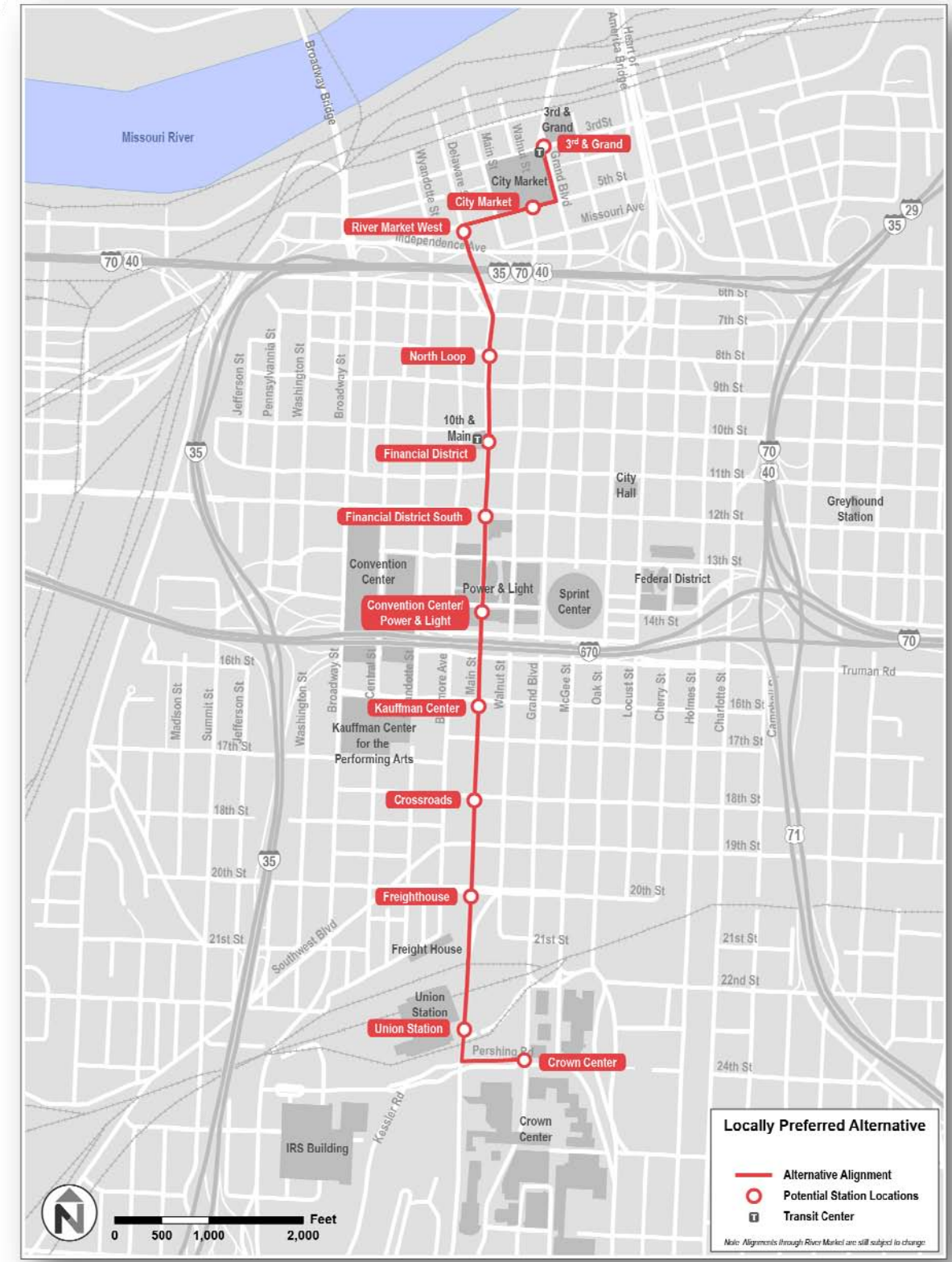
- Grand Boulevard between 3rd Street and 5th Street
- 5th Street between Grand Boulevard and Delaware Street
- Delaware Street between 5th Street and 7th Street
- Main Street between 7th Street and Pershing Road
- Pershing Road between Main Street and Grand Boulevard

7.2.3 Connectivity

The LPA would offer connections to transit at three major locations:

- Grand Boulevard at 3rd Street – new KCATA transit center with connections to KCATA services
- Main Street at 10th Street – connections with KCATA services at the existing 10th & Main transit center
- Main Street at Union Station – connections with potential regional rail services at Union Station or elsewhere in downtown.

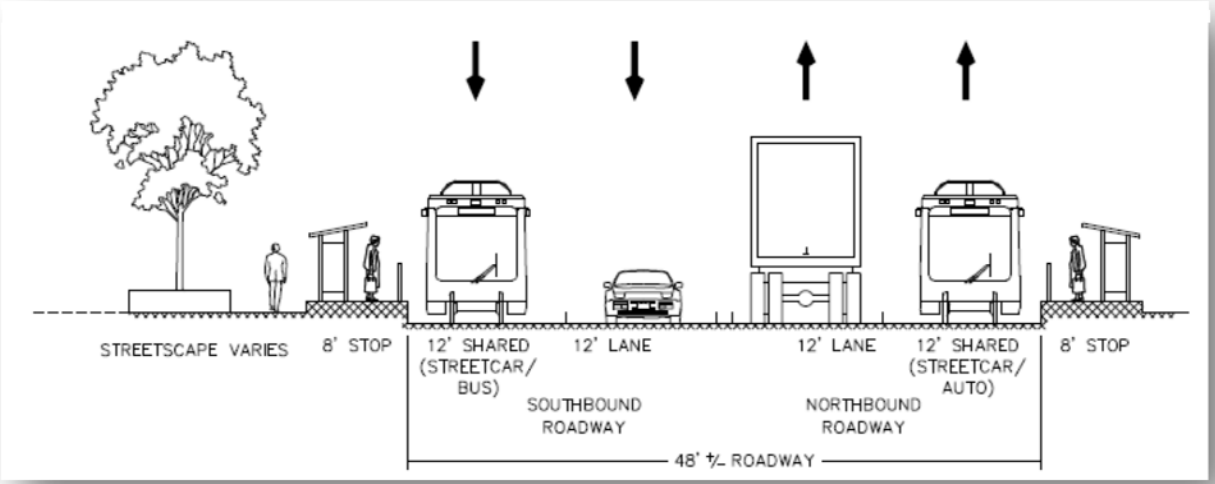
Figure 7-1: The Locally Preferred Alternative Alignment and Station Locations



7.2.4 Typical Cross Section

Most of the streetcar alignment for the LPA would operate in mixed-traffic, as illustrated a typical type of Cross section in Figure 7-2, except for the two terminal locations along Pershing Road and on Grand Boulevard at 3rd Street. South of 14th Street, service would likely operate in median lanes. Between 14th and 9th Street, service would likely operate in the curb lane.

Figure 7-2: Proposed Typical Cross Section—Main Street South of 12th Street



7.2.5 Stations

The LPA would include 12 station pairs (one for each direction on each side of the street) as shown on Figure 7-1. The general locations of the stations associated with the LPA, listed from north to south, are as follows:

- **3rd & Grand** – northern terminus, on Grand Boulevard at 3rd Street
- **City Market** – on 5th Street at Walnut Street
- **River Market West** – on Delaware Street at Independence Avenue
- **North Loop** – on Main Street at 8th Street
- **Financial District** – on Main Street at 10th Street, adjacent to KCATA transit center
- **Financial District South** on Main Street at 12th Street
- **Convention Center/Power & Light** – on Main Street at 14th Street
- **Kauffman Center** – on Main Street at 16th Street
- **Crossroads** – on Main Street at 18th Street
- **Freighthouse** – on Main Street at 20th Street
- **Union Station** – on Main Street opposite Union Station
- **Crown Center** – southern terminus, on Pershing Road at Grand Boulevard

7.2.6 Maintenance Facilities

For the selected Main Street Streetcar Alternative, a Vehicle Maintenance Facility (VMF) will be needed to provide vehicle storage and maintenance services – including vehicle inspection, exterior washing, interior cleaning, repair activities, and spare parts storage. Space for operations and administrative functions would also be included. The facility must accommodate a minimum of five streetcar vehicles (four active vehicles and one spare), based on the preliminary assessment of vehicle requirements for the Main Street Streetcar Alternative. These conceptual requirements will be confirmed in conjunction with the refinement of the preliminary operations plan, and resulting VMF needs will be updated as appropriate in future stages of project development.

The alternatives analysis process defined the technical requirements of a VMF site and identified a total of sixteen possible sites in the study area that could be considered for a future VMF. Of the sixteen potential sites, only seven exhibited high potential as a future VMF location. This effort primarily served to identify that there are potential sites for a VMF to support the various Streetcar Alternatives. A more exhaustive analysis and study will be required to further evaluate and select a site once the study moves into the advanced conceptual engineering work.

7.2.7 Service Characteristics

The following service characteristics are recommended for the LPA. More specific details of the service characteristics will be further refined in the next phase of the study.

- **Span of Service**: Monday through Thursday - 6:00 AM to 12:00 AM; Friday and Saturday - 6:00 AM to 2:00 AM; Sunday - 8:00 AM to 9:00 PM.

Table 7–1: Locally Preferred Alternative
Span of Service and Frequencies

Days	Hours	Frequency (mins)
Monday - Thursday	6 AM – 9 PM	11
	9 PM – 12 AM	22
Friday and Saturday	6 AM - 2 AM	11
Sundays	8 AM - 9 PM	22

- **Service Frequency**: Every 11 minutes; except every 22 minutes from 9:00 PM to 12:00 AM Monday through Thursday and on Sundays
- **One-way Running Time:** 14 minutes

7.2.8 Other Key Elements of the LPA

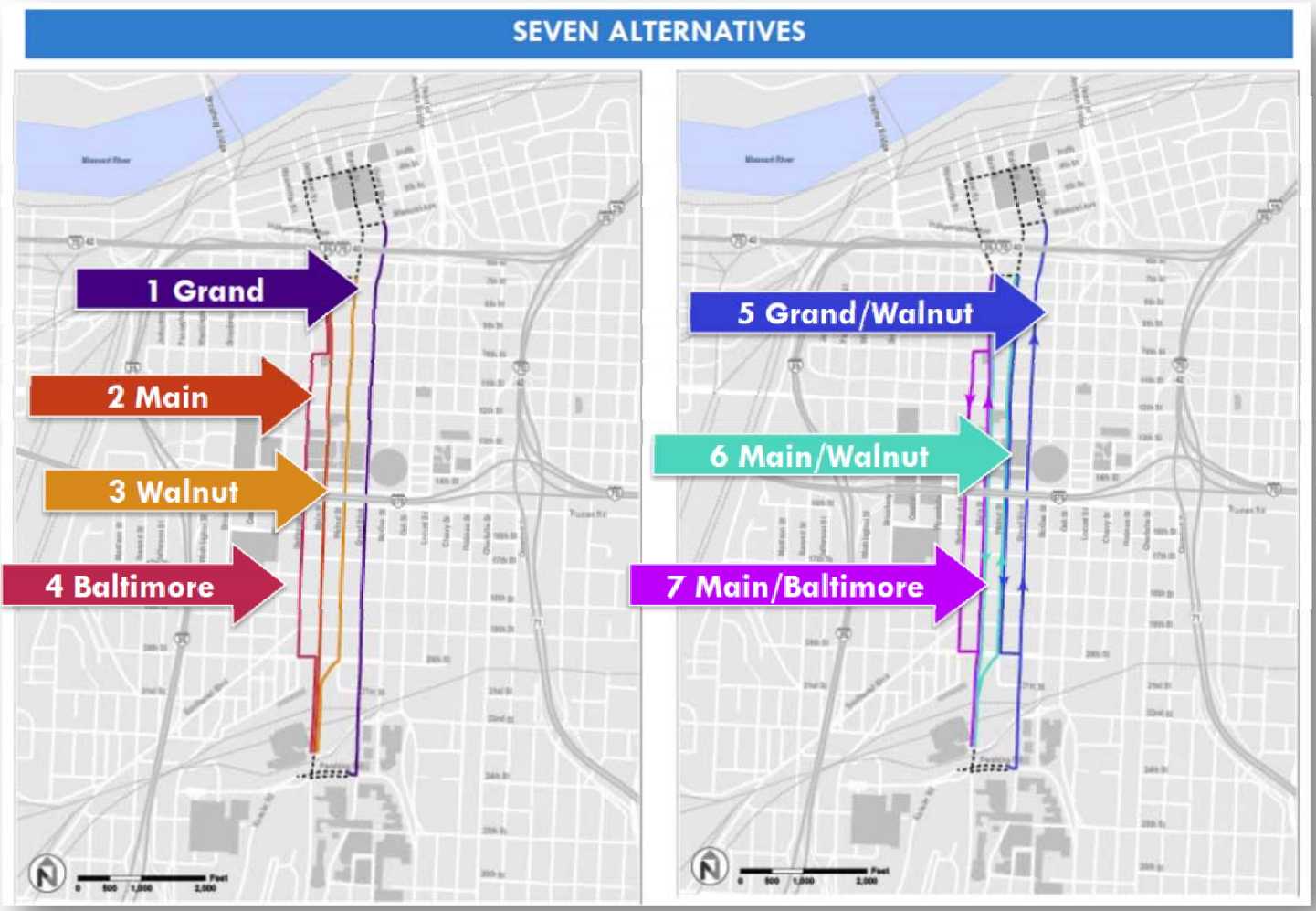
Some additional key elements of the LPA include:

- Streetcar service would be provided with single-vehicle modern-style trains
- Traffic signal priority at some intersections (locations to be determined in future)
- Station design would be similar to KCATA's MAX stations
- Fare collection via onboard ticket machines (or other options to be determined in future)

7.3 Basis for Selection of the LPA

As noted in Chapter 4 of the AA Report, the *Kansas City Downtown Corridor Alternatives Analysis* study used a multi-step process to identify a wide range of alignment alternatives, narrow the list to a smaller set of most promising alternatives, and then evaluate the remaining alternatives against a set of evaluation criteria. As is documented in Chapter 4 of the AA Report, the study implemented a 2-Tiered Screening process. Tier 1 Evaluated seven alignment options and recommended carrying two forward for further analysis in the Tier 2 screening process.

Figure 7-3: Tier 1 Alignment Options



7.3.1 Tier 1 Evaluation of Alignments

The Tier 1 evaluation process was based on several key principles and assumptions as follows:

- Screening based on 13 criteria that reflect Purpose and Need Statement that included four strategic principles: Connect, Develop, Thrive and Sustain.

- The evaluation criteria were built from these four principles and included qualitative and quantitative elements.
- Seven alignments were examined: four were bi-directional and three were couplets as shown on Figure 7-3, and all alignments were mode-neutral
- Couplet service areas for walking objectives were considered smaller than for bi-directional alternatives (1/4 mile from both directions)
- Couplet service areas for development impact objectives were larger than for bi-directional alternatives (1/4 mile from either direction)
- Alternatives were given a rating of **Best**, **Good**, or **Fair** for each criteria, and all ratings were relative.
- The Tier 1 Screening is detailed in Chapter 4, and summarized below along with the key findings.

7.3.1.1 Objectives Related to "Connect" Principle

- Improve downtown circulation
- Provide connections to major activity centers
- Provide good bicycle and pedestrian connections

Findings

- Couplet designs serve smaller walking distance and are less intuitive than bi-directional designs
- Alignments that serve 10th & Main preferable
- Tradeoff between serving Government District (employment) and the Convention Center/Kaufmann Center (visitor & special events)
- All alignments offer potentially good bicycle & pedestrian connections

7.3.1.2 Objectives Related to the "Develop" Principle

- Support development and redevelopment
- Increase the number of downtown residents
- Support larger "catalyst" development projects

Findings

- Couplet designs generally have greater development impact potential due to larger influence area
- All alternatives have good potential to increase the number of downtown residents
- All alternatives have similar potential to impact larger "catalyst" development projects on large parcels
- Two factors account for the minor differences between alternatives:
  - Spatial distribution of vacant parcels (generally cluster in western downtown)
  - Spatial variation of land values (higher in "central" alignments)

7.3.1.3 Objectives Related to the "Thrive" Principle

- Support residential and employment activity downtown
- Support downtown visitors and special events
- Incorporate public and stakeholder input

Findings

- Employment activity more numerous than population
- Employment clustered in east, population in west
- All alternatives serve visitor and special event venues, though Main best
- Main had most public support, Grand second
- Couplets generally less well supported
- Strong support for service to River Market
- Concern about service into Crown Center

7.3.1.4 Objectives Related to the "Sustain" Principle

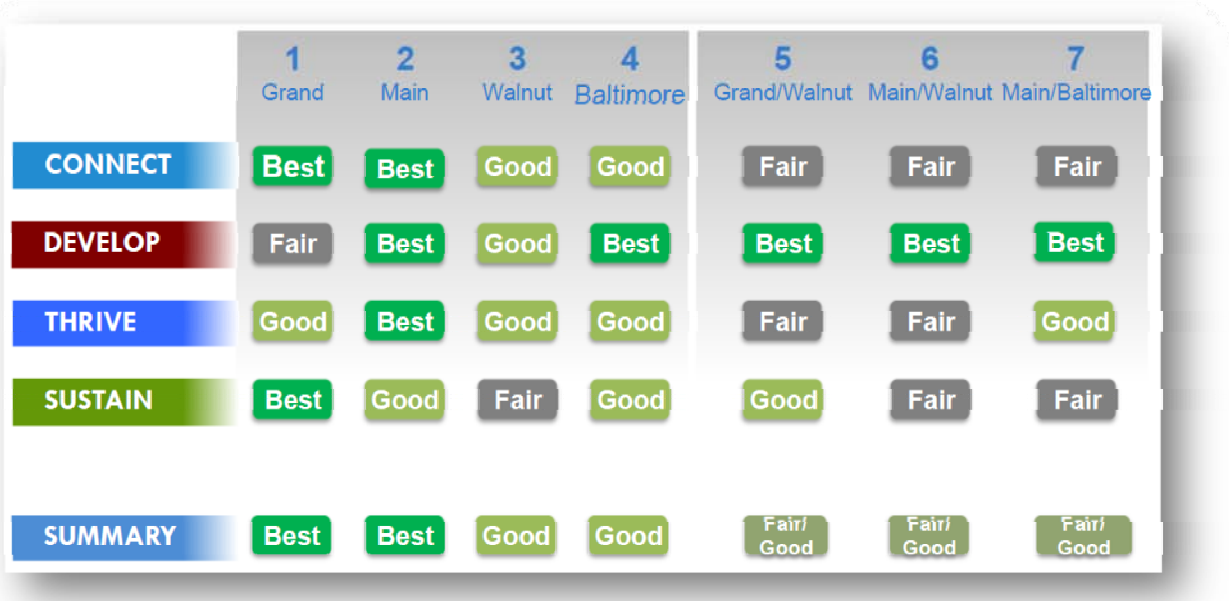
- Provide efficient and effective transit service
- Provide reliable transit service
- Convert surface parking to higher-value uses
- Consider impacts on utilities

Findings

- Grand and Main provide best opportunities for efficient and effective transit service
- Couplets have less intuitive service design
- All alternatives relatively similar in ability to provide reliable transit service
- Alternatives utilizing Grand have greater potential to redevelop surface parking
- Grand has lowest impact on utilities
- Couplets have greatest impact on utilities

The conclusion of the Tier 1 Screening resulted in two alternatives rating most favorably, and being recommended for further evaluation in the Tier 2 screening, as described below and illustrated in Figure 7-4 and Figure 7-5.

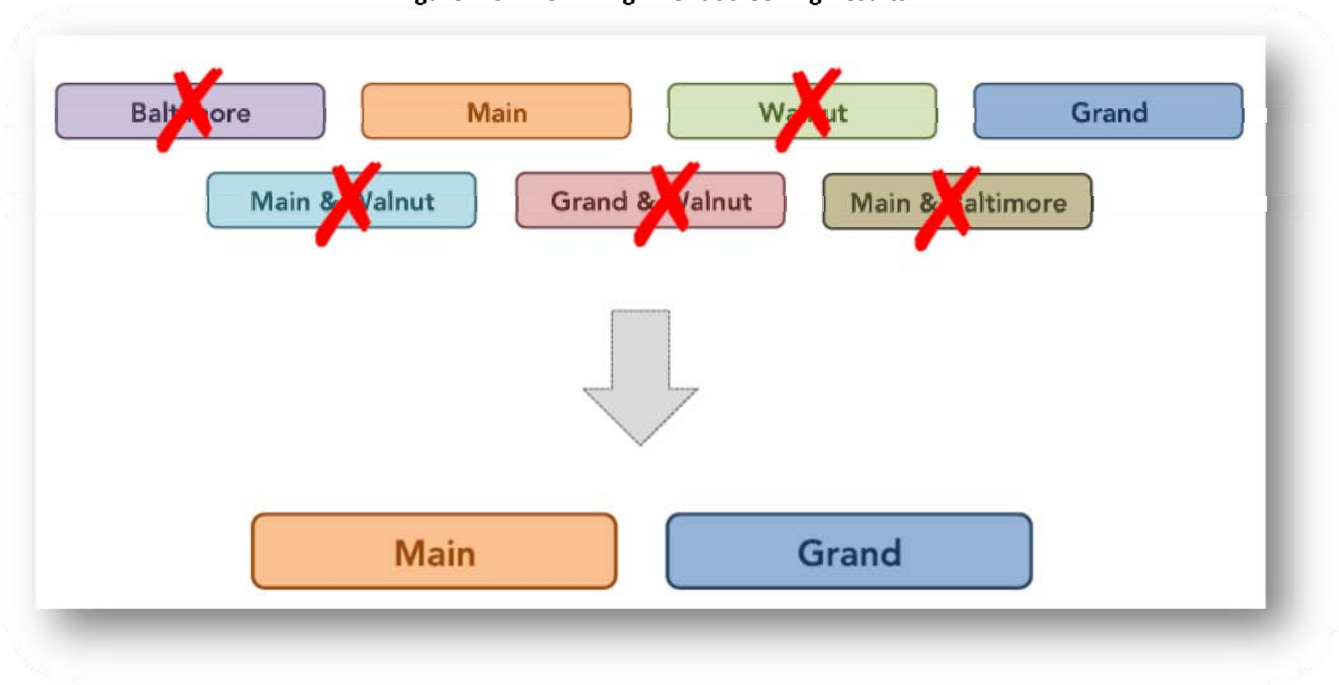
Figure 7-4: Summary of the Key Findings and Conclusions from the Tier 1 Screening of Alignments



- The **Grand Boulevard Alignment** was rated Best for the following reasons:
  - Close to downtown activity centers
  - Close to employment
  - Integrates well with existing transit service
  - Fewer utility conflicts
  - Strong public and stakeholder support
- The **Main Street Alignment** was also rated Best for the following reasons:
  - Close to downtown Activity Centers
  - Close to visitor destinations
  - Integrates well with existing transit service
  - Development Potential
  - Strong public and stakeholder support

The results of the Tier 1 Screening are shown in Figure 7-5; the study team recommended carrying the Grand Boulevard and Main Street Alignments into the Tier 2 screening process.

Figure 7-5: Tier 1 Alignment Screening Results



7.3.2 Tier 2 Evaluation of Alternatives

The Tier 2 Screening Process was built on the conclusions of the Tier 1 findings and recommendations. The two alignment options were further developed into alignment and mode alternatives. Each alignment was developed to include both an Enhanced Bus Alternative and a modern Streetcar Alternative, as shown in Figure 7-6. The key characteristics of the mode alternatives are shown in Figure 7-7. Figure 7-8 shows the alignments and stop or station locations for the Tier 2 Alternatives.

Figure 7-6: Tier 2 Alignment and Technology Alternatives

Figure 7-7: Key Characteristics of the Tier 2 Streetcar and Enhanced Bus alternatives

Streetcar	Enhanced Bus
• Higher capital costs	• Lower capital costs
• Appeals to choice riders	• Not as attractive to choice riders
• More comfortable ride	• Less comfortable ride
• Larger, roomier vehicle	• Bus designs are becoming more attractive
• Easier to understand and use	• Less easy to understand and use
• Bicycles accommodated on-board	• Bicycles located on rack in front of bus
• More iconic for City	• Does not grab attention
• Has been shown to spur development	• Has less significant impact on development
• More visual impacts from wires and tracks	• Less visual impacts
• No localized emissions	• Localized emissions from buses

There were several key assumptions in the Tier 2 evaluation of alternatives approach, as follows.

- Walking distances based on ¼-mile buffers
- Economic development based on blocks, not walking distance
- Opening year 2015
- Forecast year 2035
- Household data from US 2010 Census
- Employment data from MARC Travel Demand Mod

7.3.2.1 "Connect" Evaluation Criteria and Findings

- **Connections With Activity Centers:** Number of Activity Centers within ¼ Mile of Stations; Activity Levels (Employees, Households, Hotel Rooms, etc.) within ¼ Mile of Stations; and Walking Times to Activity Centers.
  - **Main:** Directly serves 10th & Main Transit Center, and serves more special event and visitor activity centers.
  - **Grand:** Directly serves the Sprint Center, and better serves the Government District employment center.

Figure 7-8: Tier 2 Enhanced Bus and Modern Streetcar Alternatives

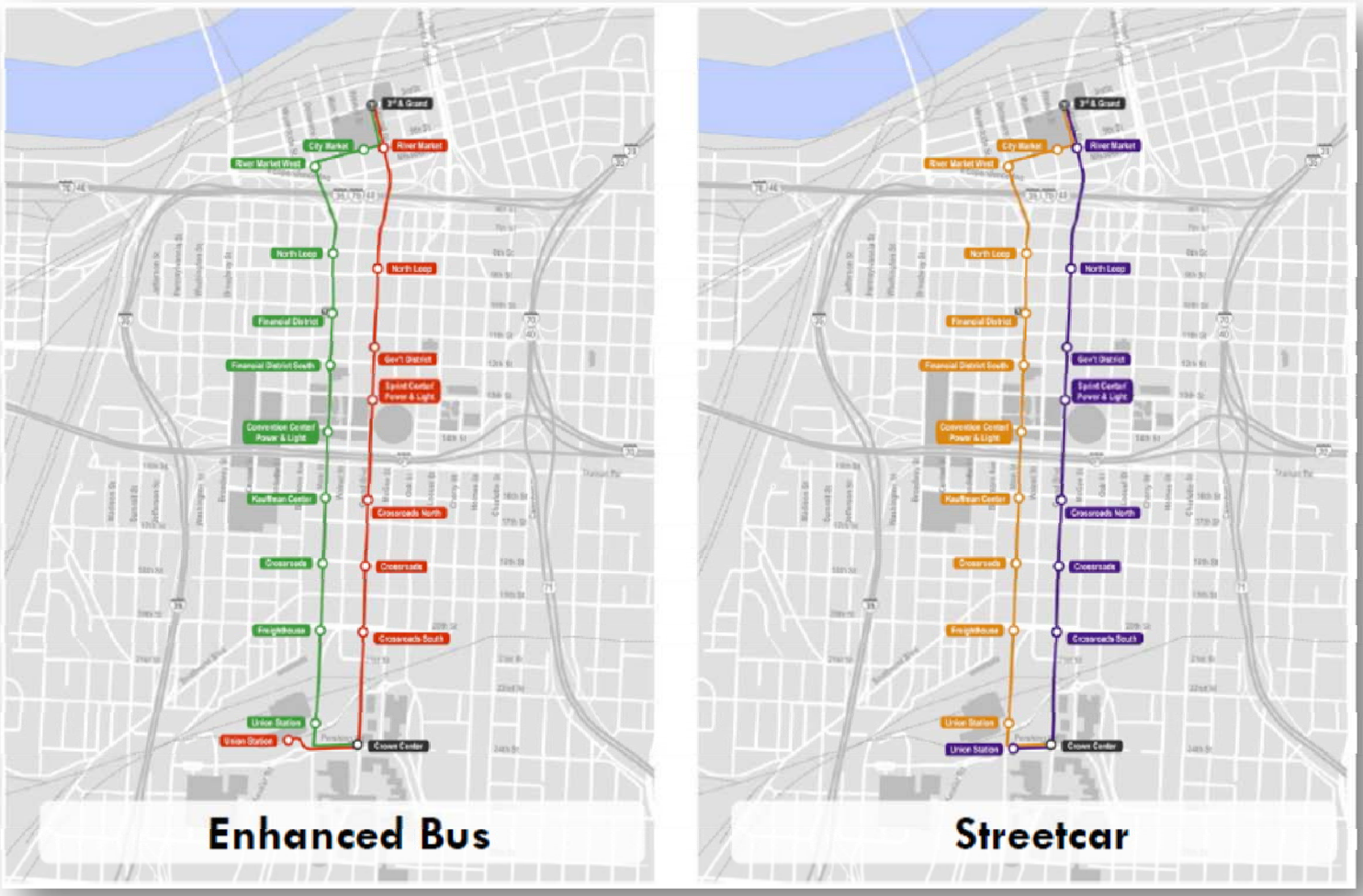


Figure 7-9: Activity Levels within ¼ mile: Housing Units, Employees, Hotel Rooms and Special Events

	Main		Grand	
	EB	SC	EB	SC
Housing Units (2010)	3,211	3,211	2,907	2,677
Employees (2005)	47,150	47,150	50,853	50,853
Hotel Rooms (2005)	3,474	3,474	2,469	2,469
Special Event Annual Attendance (2010)	5.7 million	5.7 million	3.3 million	3.3 million

EB = Enhanced Bus, SC = Streetcar

- **Assessment of Pedestrian and Bicycle Environment:** Review of Pedestrian and Bicycle Connections to/from Stations.
  - Both **Main** and **Grand** have generally good and similar walking and bicycling environments
- **Activity Centers:** 13 activity centers as identified in local planning documents; Walk times estimated using Google Maps; Employment data from Regional Travel Demand Model; Household data from

2010 US Census; Hotel Room data compiled by project team; Special event venues compiled by project team:

7.3.2.2 *"Develop" Evaluation Criteria and Findings*

- **Existing Economic Activity**: Population and Housing; Employment; Hotel Rooms; Special Event Venue Attendance; Retail Sales; Corridor Market Value
- **Economic Development:** Quantitative Assessment, and Qualitative Assessment
  - **Streetcar Alternatives** are expected to induce economic growth over the baseline growth to 2025
  - **Enhanced Bus Alternatives** are not expected to induce significant additional (over base case) economic growth
  - Projected additional growth is higher on **Main Street** as compared with **Grand Boulevard**

7.3.2.3 *"Thrive" Evaluation Criteria and Findings*

- Residential and Employment Growth
  - **Main**: Serves more residents, housing units, hotel rooms; has higher special event attendance
  - **Grand:** Serves greater employment (within ¼ mile)

Figure 7-10: Activity Levels within Station areas of the Tier 2 Alignments

	Main EB and SC	Grand EB and SC
Employees within ¼ mile (2005)	47,150	**50,853**
Population within ¼ mile (2010)	**4,405**	4,063/3,720
Housing Units (2010)	**3,867**	3,061
Hotel Rooms (2010)	**3,474**	2,469
Venues - Annual Attendance (2010)	**5.7 million**	3.3 million
Retail Sales Within 1 Block (2010)	$93 million	**$97 million**
Corridor Property Market Value (2010)	**$1.59 billion**	$1.57 billion

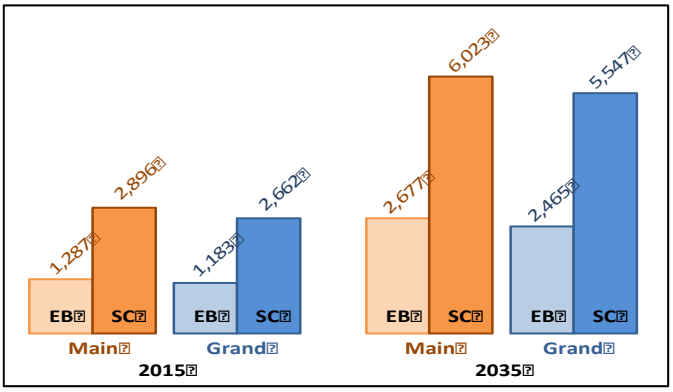
- Transit Reliability
  - **Main** had no scheduled street closures in 2011
  - **Grand** had 21 scheduled street closures in 2011
- Public and Stakeholder Input
  - Overwhelming support for **Streetcar** over **Enhanced Bus** at public forums
  - Most liked the simplicity of both alignments
  - Development stakeholders feel short-term market is from residents, downtown visitors and guests; Main Street serves these folks better
  - **Main** received more numerous and vocal support

- **Grand** received significant opposition from some key stakeholders

7.3.2.4 "Sustain" Evaluation Criteria and Findings

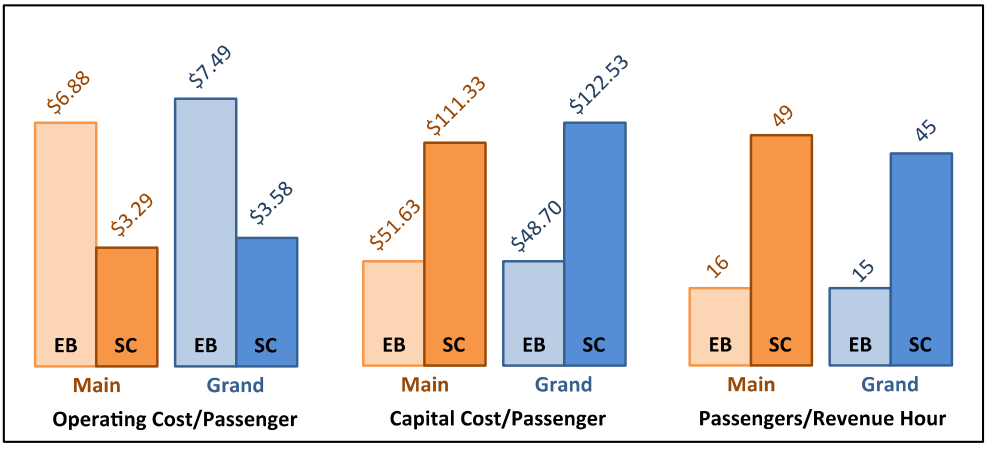
- Ridership
  - **Streetcar** ridership significantly higher than **Enhanced Bus**
  - **Main** ridership approximately 9% higher than **Grand**

Figure 7-11: Estimate of Average Weekday Riders



- Capital and Operating Cost
  - Streetcar capital costs are five times more expensive than Enhanced Bus: $100 m vs. $20 m
  - Higher capital costs on Main Street than Grand
  - Streetcar operating costs would be slightly more expensive–higher vehicle and non-vehicle maintenance costs
  - Bus operating costs would not be significantly lower because more vehicles in operation

Figure 7-12: Estimated Operating Cost Metrics

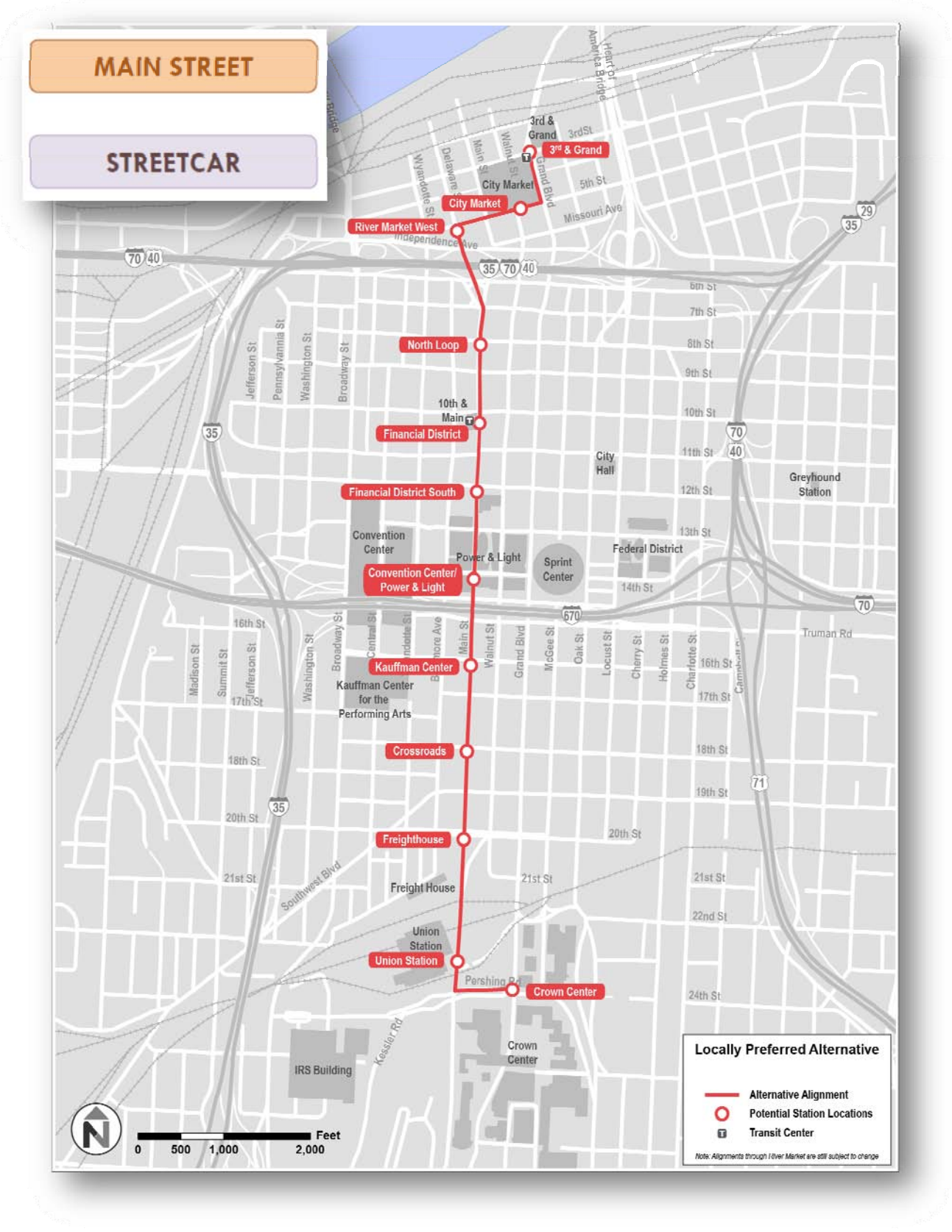


- Environmental and Historic Resources
  - Pre-NEPA analysis indicates no significant impacts or differences between the two alignments

Figure 7-13: Tier 2 Summary Findings and Conclusions

	Alternatives Best Meeting Each Criterion	
	Alignment	**Mode**
Activity Center Connections:	MAIN	none
Activity Levels:	MAIN	none
Bicycle & Pedestrian Connectivity:	none	none
Existing Economic Activity:	none	none
Economic Development Potential:	MAIN	STREETCAR
Residential & Employment Activity:	MAIN	STREETCAR
Transit Reliability:	MAIN	none
Public & Stakeholder Support:	MAIN	STREETCAR
Ridership Projections:	MAIN	STREETCAR
Capital & Operating Costs:	none	ENHANCED BUS
Service Effectiveness:	MAIN	STREETCAR
Environmental & Historic Resources:	none	none

Figure 7-14: Tier 2 LPA Recommendations: Select Streetcars on Main Street



7.4 Finance Strategy for the LPA

The consultant team, working in close coordination with City officials, has developed guiding principles and a preliminary financing plan that it recommends for the Locally Preferred Alternative Project. At this point, the financing plan is preliminary, because (1) the costs of the Project will be refined from the initial estimates in this report, (2) stakeholder consultations are only in the early stages and the results of those consultations will very likely impact the specifics of the financing plan. Following is the preliminary finance plan, subject to further refinement.

Guiding Principles:

- No dedicated city-wide sales or property tax
- Fixed rail system creates "permanence" that spurs investment
- No diversion of KCATA funding
- Maximize opportunities for Federal contribution

From the outset of this Alternatives Analysis process, the City has consistently stated its belief that the finance plan must be *downtown-focused* rather than imposed over the City as a whole, in order to be viable under local conditions. City planners and civic leaders have generally accepted the proposition that a downtown circulator constructed with a fixed guideway (such as embedded rails) will not only provide beneficial transit effects, but also (importantly) will provide a sense of permanence that will lead to significant investment and reinvestment in the vicinity of the fixed guideway system. The consultant team, as well as stakeholders and civic leaders, understand that any new system will likely need to be funded substantially by newly created revenue, so that existing levels of transit service are not diminished. Finally, all parties generally agree that aggressive efforts must be undertaken (at the appropriate time) to secure one or more Federal contributions to help pay for the capital cost of the Project.

7.4.1 Preliminary Funding Strategy for the Locally Preferred Alternative

In order to create new funding sources that are downtown-focused, the study team recommends that the Project be constructed and financed under the auspices of a Missouri Transportation Development District, or "TDD", formed pursuant to the Missouri Transportation Development District Act, § § 238.200, et seq., RSMo (the "TDD Act"). A TDD is a special benefit district that operates as a separate entity and is a political subdivision of the State, governed by a Board of Directors. A TDD has the statutory power to establish (after the approval of a majority vote of the qualified voters within the TDD) several sources of revenue, that would be generated within the boundaries (and only within the boundaries) of the TDD.

Stakeholders would be asked to agree to the formation of a TDD with boundaries that cover much of the downtown core area. The specific boundaries remain subject to refinement, but the consultant team suggests a district that runs (generally) from the Missouri River on the north to 27th Street on the south, encompassing east to west the bulk of the "River Market" area, all of the property in the "downtown loop" and property south of the downtown loop generally from the centerline of Broadway on the west to the centerline of Locust on the east.

The preliminary capital cost estimate for the Project is just over $100 Million (as shown in Table 7-1). First year Operation and Maintenance Costs ("O&M") are projected to be approximately $2.8 Million. In

the formulation of this preliminary finance plan, the study team has assumed receipt of $25 Million in Federal funding assistance, (which we believe to be a reasonable assumption) although Federal funding is not assured. We have also taken into account the expressed intention of the City to provide $2 Million toward the cost of Advanced Conceptual Engineering.[10] Based on this assumption, the revenue to be generated under the finance plan should (1) support annual debt service on the remaining capital costs of $73 Million, (2) cover annual O&M costs, and (3) allow for the creation of a reasonable reserve for extraordinary repairs or replacement of equipment.

Table 7–2: **Project and Finance Costs**

Project Costs (includes aggregate contingency of $18 Million)	$ 100,000,000
City Funding of Advanced Conceptual Engineering	$ (2,000,000)
Federal Funding	$ (25,000,000)
Net Project cost to Finance*	**$ 73,000,000**
*This amount could be reduced as design and engineering proceed further.	

It is anticipated (based on discussions with City officials) that the required local contribution to the capital costs ($73 Million) would be financed by limited obligation revenue bonds issued by the TDD or another qualified issuer and payable from the TDD's revenue stream pledged to repay such bonds. With respect to such bonds, the annual debt service would vary depending upon many factors, including most particularly the interest rate and the debt service coverage ratio required by the capital markets when the bonds are actually issued.

The City's independent professional financial advisor, First Southwest Company ("First Southwest"), provided guidance for modeling the preliminary finance plan using the following assumptions:

- Issuance of 25-year bonds in April 2013 in an amount necessary to generate a project fund of $73 Million;
- Additional security for the bonds through an annual appropriation guaranty of the bonds on the part of the City;
- 5.33% true interest cost, with net minimum debt service coverage of 1.25; and
- Capitalized interest through November 2013;
- Debt service reserve fund equal to maximum annual debt service;
- Establishment of a 15% Operating Cost Reserve, funded from TDD revenues; and

[10] The Project could also receive up-front or periodic revenue from "naming rights" for vehicles, although we have made no projection of the revenue that could be derived from "naming rights" for vehicles. Revenue from naming rights that is obtained up-front can be used to reduce the capital costs to be financed.

- Periodic growth/decline rates for revenue and expense, as follows:
    - District Sales Tax – Increases one percent (1%) annually
    - Property Assessments – Increases two percent (2%) bi-annually
    - Surface Parking Assessments – Decreases two percent (2%) annually
    - Fares – Increases one percent (1%) annually
    - Ad Revenue – No periodic growth
    - O&M Cost– Increases two percent (2%) annually.

Applying the debt service requirements modeled by First Southwest, a number of potential components of revenue that could be generated by a TDD under the TDD Act were identified. The possible revenue sources, at the rates set out in Table 7-2, would provide sufficient revenue to repay the bond financing modeled by First Southwest. The components, and possible rates for each of the components are set out in Table 7-3, which also contains an explanation of the basis for the projected Year One amount of each item of revenue and expense. These numbers are preliminary and subject to change, although the formation and operation of a TDD, and the generation of TDD-derived revenue, is the essence of this preliminary finance plan, and – based on the consultant's review – such a finance plan is legally permissible and financially feasible. It is worth noting that the assumptions underlying the revenue projections do not include any increases in property values or taxable sales that are expected to occur as a result of new development or redevelopment of underutilized parcels.

Table 7–3: Projected Annual Sources of Revenue Through Transit Development District

Special Assessment on Real Property Assessed Value	$5,140,000	Total projected assessment for 2013. Rates per $100 AV: Commercial $0.52, Residential $0.70, City $1.04. Special Assessments on commercial property do not apply to market value over $150,000,000.
One Cent Sales Tax in District	$3,800,000	Estimated based on aggregate area-wide data provided by KCMO
Special Assessments on Commercial Surface Parking	$ 730,000	Based on estimate of 4,000 commercial surface parking spaces assessed at $182.50 per space per year ($0.50/space/day) - only assesses surface commercial pay lots.
Ridership Fares	$ 529,000	Year 1 ridership projected to be 2,900 per average day. Assumes fare of $1.00, but reduced by 50% to account for transfers and possible promotional vouchers. Ridership fares may be inefficient revenue source due to cost of implementing and enforcing
Advertising Revenue	$ 100,000	
TOTAL	**$ 10,299,000**	

It is anticipated that the City and stakeholders will pursue low-cost governmentally-assisted financing for some or all of the costs of the Project, through such programs as TIFIA and/or Missouri's State Infrastructure Bank, among others. Low-cost financing for some or all of the $73 Million in capital costs expected to be financed could reduce the amount of TDD-derived revenue required for such financing.

Table 7–4: Projected Annual Assessments

Assessment Rate per $100 of Assessed Value	**Commercial $0.52, Residential $0.70, City $1.04**
Commercial per $1 Million of Fair Market Value	$ 1,664
Residential per $200 Thousand of Fair Market Value	$ 267
City per $1 Million of Fair Market Value	$ 3,328
Annual City Assessment Payment	**$ 809,979**

Based on discussions with City officials, there appears to be support for implementing a financing plan similar to this preliminary finance plan, provided that the City's credit risk is minimized to the satisfaction of the City.

The consultant team recommends that a relatively small working group of major stakeholders be established to pursue a Federal contribution and low-cost governmentally-assisted financing for some or all of the costs of the Project, and that the working group proceed to refine this preliminary financing plan, consistent with the guiding principles set forth at the outset of this section.