NORTHSIDE-SOUTHSIDE STUDY

FINAL

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EAST-WEST GATEWAY
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DETAILED DEFINITION OF ALTERNATIVES REPORT

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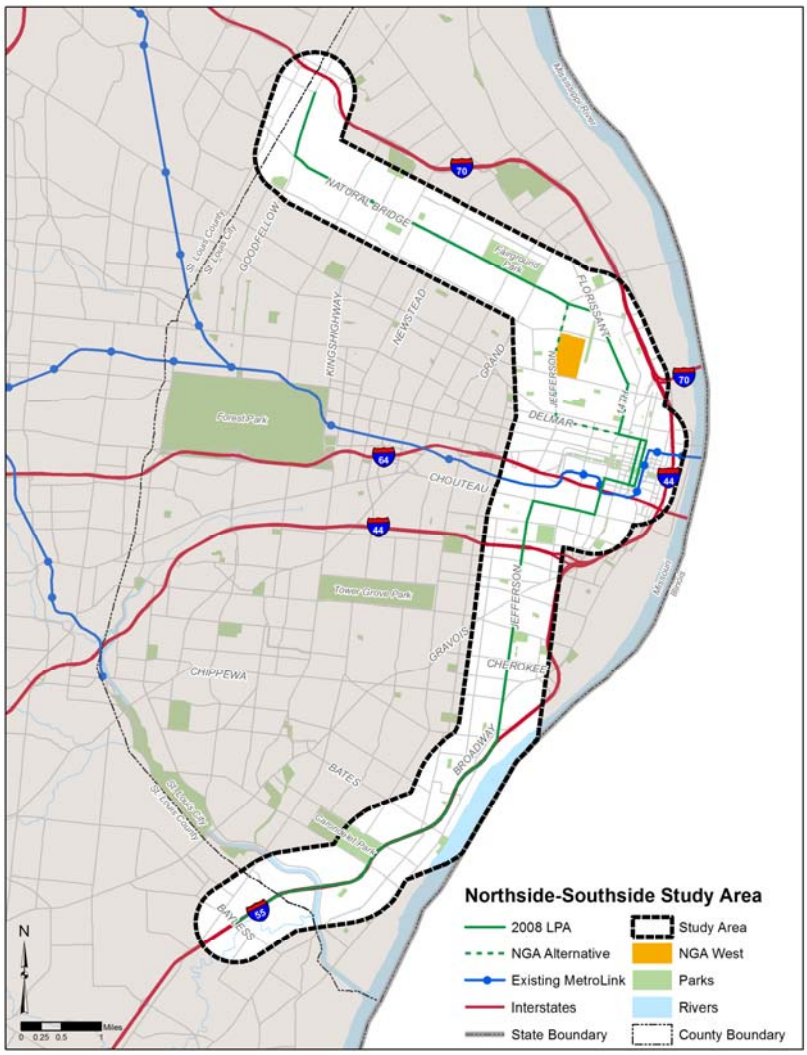
1.0 Introduction

The Northside-Southside MetroLink Conceptual Design Study (Northside-Southside Study) is being led by the East-West Gateway Council of Governments (EWGCOG) with support from the City of St. Louis. The Northside-Southside Study builds upon the 2008 Northside-Southside Study, which included a previously-adopted locally preferred alternative (LPA), as shown on Figure 1-1.

Since the proposed Northside-Southside MetroLink expansion line was first explored in the late 1990s and then studied in 2008, the City of St. Louis and its neighborhoods have changed considerably. New development has transformed much of the central corridor. South St. Louis, along Broadway and Jefferson Avenue, has enjoyed grassroots community revitalization with the addition of new residents and small businesses. North St. Louis is the future home of the multi-billion dollar National Geospatial-Intelligence Agency (NGA) West campus. The proposed Northside-Southside line would have the potential to leverage and extend the economic growth and momentum happening in the City of St. Louis. However, concentrations of poverty, joblessness, and crime continue to erode neighborhoods in both North and South St. Louis.

Figure 1-1: Northside-Southside Study Area



Through this study, decision-makers will work with stakeholders and members of the public to select a light rail investment that meets the needs of the community while maximizing competitiveness for federal capital funding through the Federal Transit Administration's (FTA) New Starts Capital Investment Grant Program.

2.0 Overview of Project Process and Evaluation Criteria

The Northside-Southside Study is following a two-phase method to identify and develop the LPA:

- Phase 1 will advance the definition of the LPA that was recommended during the 2008 Northside-Southside Study (hereinafter 2008 LPA), including the identification of potential alignment options in the area around the NGA facility (as documented in this report). Phase 1 will also include detailed evaluation of the potential alignment alternative(s). The detailed evaluation will result in the identification of the preferred alternative, including the best-performing minimal operable segment[1] (MOS), which will include a preferred alignment in the area around the NGA facility. The alternative resulting from this evaluation will become the preferred alternative, which will be advanced for further refinement in Phase 2.
- Phase 2 will refine the preferred alternative selected at the end of Phase 1 to become the LPA. The LPA will include an MOS, which will be the first investment in construction of the full 17-mile corridor.

The evaluation criteria associated with each phase are a combination of quantitative and qualitative performance measures. Phase 1 will apply metrics that are linked to the project goals and objectives (as defined in the study Purpose and Need Report, available under separate cover) and will identify the preferred alternative; Phase 2 will evaluate the preferred alternative against federal criteria to determine the LPA. This two-phase process will result in the identification of an LPA that not only meets locally-identified project purpose and needs, but is also competitive for federal funding.

Table 2-1 presents the evaluation criteria that are likely to be used during the two phases of alternative evaluation. Phase 2 will build upon the criteria from Phase 1, ensuring a consistent rating throughout. Details of these criteria, including the methodology and screening thresholds, will be defined as the study moves into each phase.

Table 2-1: Project Evaluation Criteria

Project Goals	Phase 1: Detailed Evaluation	Phase 2: Refinement of the LPA
Foster Sustainable Development and Redevelopment	Station area population and employment densities Station area equity characteristics Station area land use and economic development opportunities Environmental impacts/benefits	Economic development [a] Land use [a] Environmental benefits [a]
Improve Access to Opportunity	Ridership Transit travel times Traffic impacts Parking impacts Potential right-of-way impacts Bicycle and pedestrian impacts	Mobility improvements [a] Congestion relief [a]

[1] An MOS is a segment of the LPA that provides the most cost-effective solution with the greatest benefits for the project. According to the FTA, the MOS must be able to function as a stand-alone project and not be dependent on any future segments being constructed.

Project Goals	Phase 1: Detailed Evaluation	Phase 2: Refinement of the LPA
Develop and Select an Implementable and Community-Supported Project	Capital and operating and maintenance costs Cost effectiveness Community support	Financial capacity analysis [a] Cost effectiveness [a]

[a] *Consistent with FTA New Starts criteria.*

Report Overview

This report defines the key physical and service elements of the transit alternatives that will be evaluated during Phase 1, detailed evaluation of alternatives. These alternatives are summarized below and discussed in detail in subsequent sections of this report.

Key Physical and Service Elements

For purposes of estimating cost and ridership, as well as assessing impacts and benefits, the Northside-Southside Study defines the detailed alternatives based on the following categories.

- Service plan
- Stop locations/spacing
- Station facilities
- Runningway
- Transit vehicles
- Fare collection
- Technology/customer information
- Identity/branding
- Maintenance facility

Detailed Alternatives

The detailed alternatives, which are described in more detail in Chapter 4 of this report, are all street-running light rail transit (LRT); the primary differences are related to runningway configuration (comparing the 2008 LPA recommendations to updates/modifications based on additional analysis) and route alternatives/station locations in the area around the planned NGA facility.

The corridor is divided into segments to simplify the alternative definition and evaluation process. This segmentation will facilitate the identification and comparison of up to three MOS through the modular organization of data. Consistent data collection and analyses will be applied along the full length of the corridor, but the results will be reported in segments defined in the following subsections. This will enable a quick comparison of different combinations of segments as MOSs are developed and considered, and will facilitate internal and external decision making. These segments represent natural breakpoints in either corridor development character or right-of-way geometry.

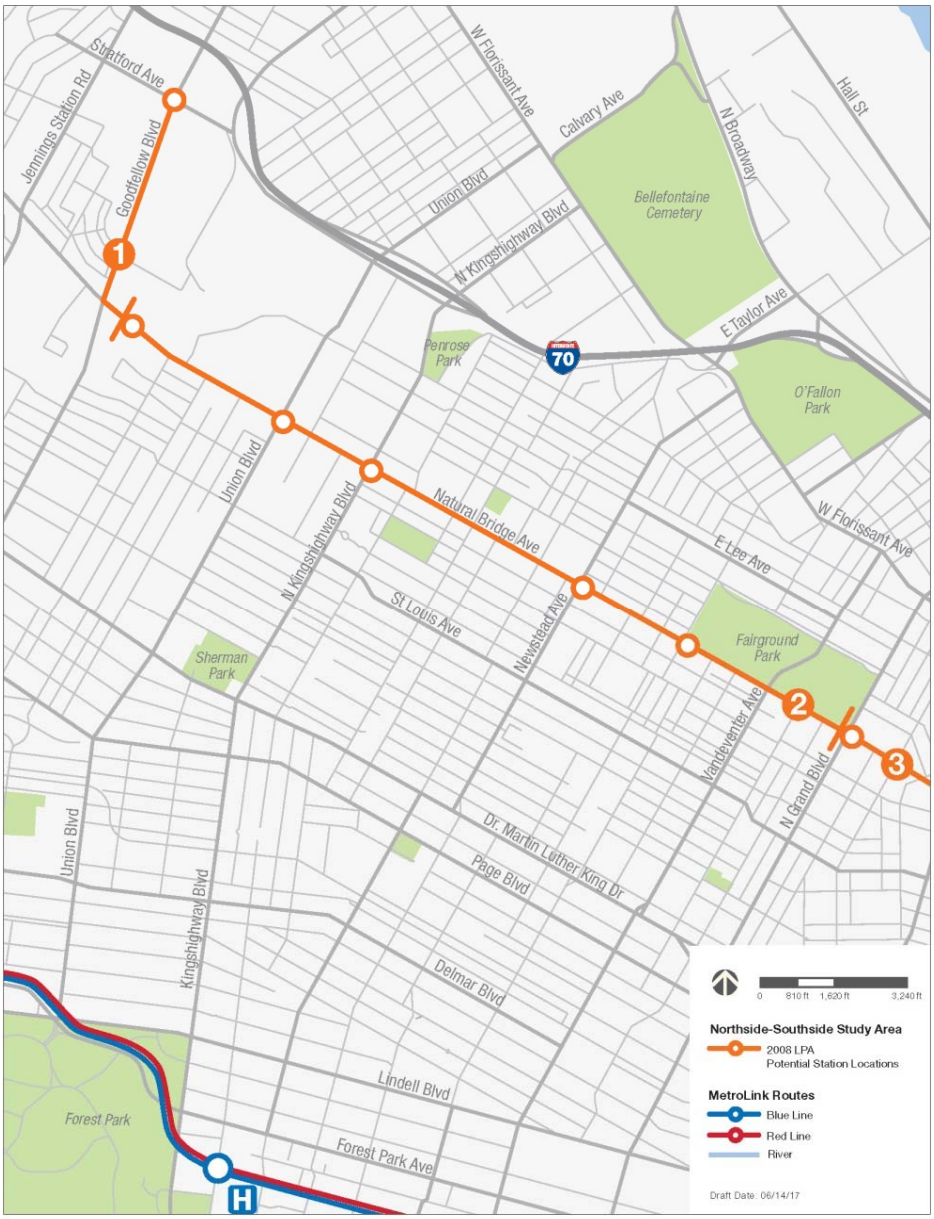
Each of the corridor segments for detailed definition and evaluation are shown on Figures 2-1 to 2-5.

Segments 1 and 2

Segment 1 runs from the terminal station at Stratford Avenue and Natural Bridge Avenue to just north of the Goodfellow Boulevard/Natural Bridge Avenue Station.

Segment 2 runs from the Goodfellow Boulevard/Natural Bridge Avenue Station to just north of the Grand Boulevard Station.

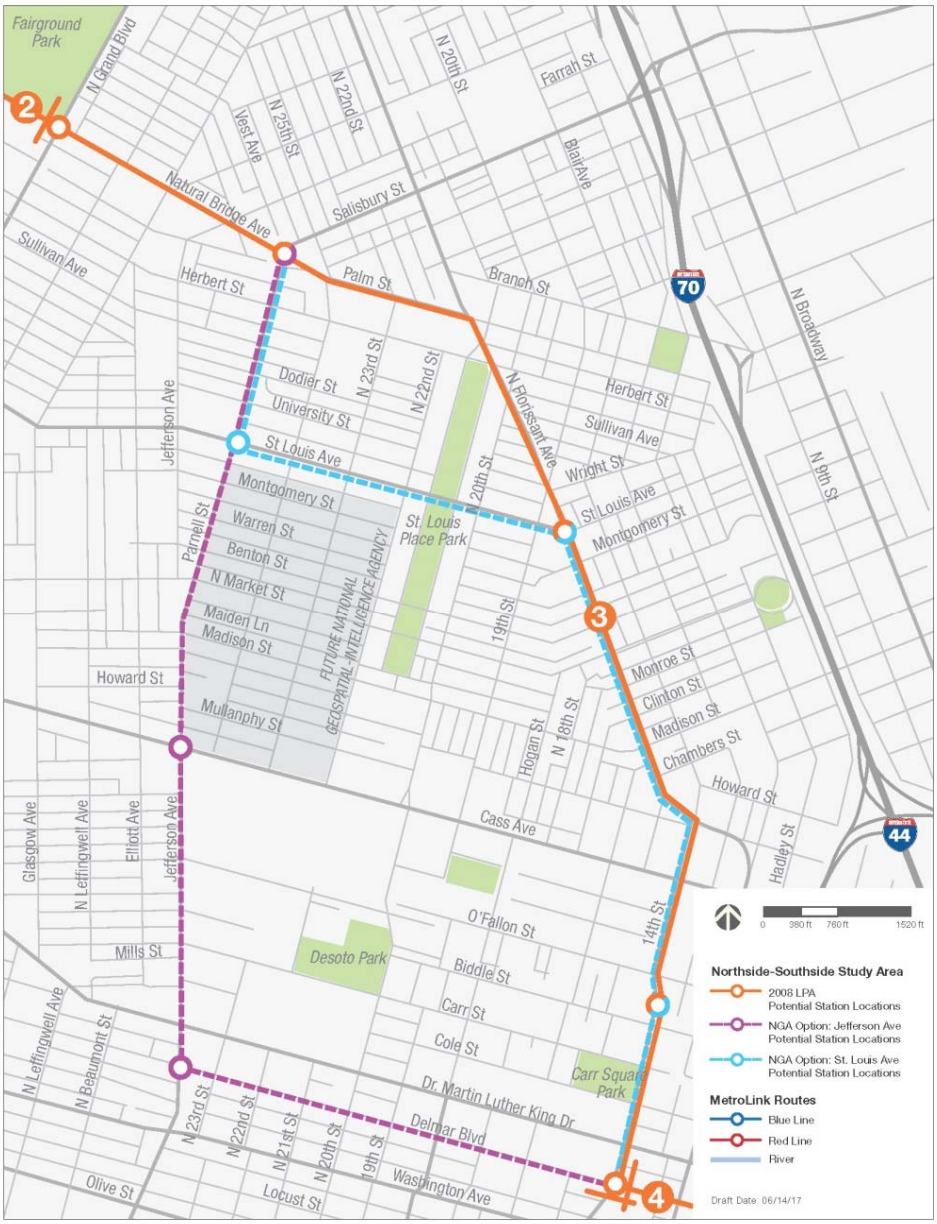
Figure 2-1: Segments 1 and 2



Segment 3

Segment 3 runs from the Grand Boulevard Station to just south of the 14th Street/Convention Plaza Station and includes three options: the first option (shown in orange) follows the 2008 LPA route, the second option (shown in blue) follows the 2008 LPA route, then turns south on Parnell Street and east on St. Louis Avenue before rejoining the 2008 LPA route, and the third option (shown in purple) turns south on Parnell Street and Jefferson Avenue, then east on Delmar Boulevard to reach the 14th Street/Convention Plaza Station.

Figure 2-2: Segment 3



Segment 4

Segment 4 runs through downtown from just south of the 14th Street/Convention Plaza Station to Park Avenue Station along 9th/10th Streets (one-way pair), Clark Avenue, 14th Street, Chouteau Avenue, and Jefferson Avenue.

An alternative alignment, as shown by the dashed green line, would diagonally cross the existing surface parking lot that is bounded by Convention Plaza, North 11th Street, North 10th Street, and Lucas Avenue, and then use Lucas Avenue between 9th and 10th streets. This alternative would then follow 9th and 10th streets to reach Clark Avenue.

Figure 2-3: Segment 4

Segment 5

Segment 5 runs from just south of the Park Avenue Station to the Chippewa Street Station along Jefferson Avenue.

Figure 2-4: Segment 5

Segments 6 and 7

Segment 6 runs from just south of the Chippewa Street Station to just north of the Loughborough Avenue Station. Segment 7 runs from just south of the Loughborough Avenue Station to the southern end of line along Jefferson Avenue and I-55[2]. The dashed line indicates where an alternative alignment along Broadway may be studied in future project phases.

Figure 2-5: Segments 6 and 7

[2] It is likely that the outcome of the Northside-Southside Study will be an LPA with a MOS, which will be the first phase of investment in the full 17-mile corridor. Following selection of the MOS, further evaluation should be conducted to determine whether the alignment along Broadway better meets the purpose and need of the Northside-Southside Study than the alignment along I-55, which was identified as the LPA during the 2008 study.

3.0 No Build Alternative

The No Build Alternative is comprised of all transit improvements within the corridor that exist currently or have dedicated funding for future improvement by 2040. For purposes of the detailed definition of alternatives, the No Build Alternative is assumed to be continued operations of existing service for all corridor routes.

Service Plan

The service plan for the No Build Alternative reflects the financially constrained *Connected 2045 Long Range Transportation Plan*. This plan maintains the existing service levels on the Red and Blue MetroLink lines and includes the opening of the Cortex Station, currently under construction along the central corridor.

Light Rail Service

Metro operates two light rail lines, known as MetroLink. Currently MetroLink operates east-west through the region and study area, generally perpendicular to the Northside-Southside corridor under studied. MetroLink accounts for approximately 35 percent of the transit trips provided by Metro. In 2016, the six MetroLink stations in the study area (Union, Civic Center, Stadium, 8th & Pine, Convention Center, and Laclede's Landing) combined had more than three million boardings.

Corridor Bus Routes

The No Build bus network reflects the August 2017 service changes that accompanied the Civic Center Station expansion. This includes four MetroBus routes (4, 11, 74, and 40X) that would provide service along segments of the corridor. No route would provide service along the entirety of the corridor under the No Build Alternative. As shown in Table 3-1, Routes 4, 11, and 74 would provide all-day service, approximately 20 hours per day, with headways ranging from 20 to 40 minutes. Route 40X is an express route along I-55 that would operate every 30 minutes during peak periods only.

Historic boarding and alighting data for corridor routes[3] combine to more than 11,000 average weekday boardings in October 2012, 2013, and 2014. In recent years these routes have experienced a decrease in transit ridership. In October 2016, average weekday ridership was approximately 9,000 boardings, as shown on Figure 3-2. The decrease in ridership on these routes reflects a trend of system-wide ridership losses. Other factors that may have contributed to ridership declines specific to these routes include reduction in service frequency on Route 11 and two additional routes serving the St. Louis Community College Florissant Valley (previously only served by Route 74). Notwithstanding recent declines in total ridership, Routes 4, 11, and 74 are still some of the most productive routes in Metro's system, carrying 60 percent to 115 percent more riders per trip than the MetroBus system average, as shown on Figure 3-3.

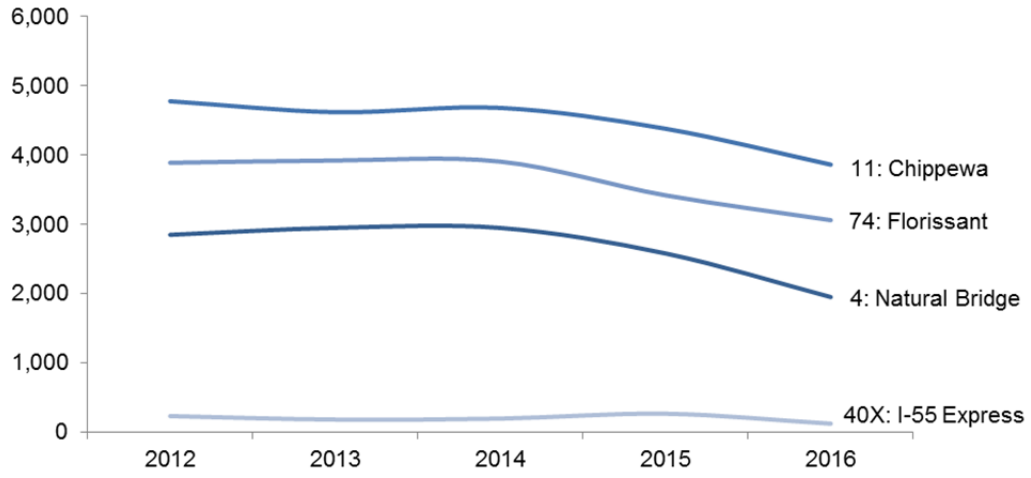
[3] For routes that have undergone pattern changes between available boarding and alighting data and existing service, boardings are reported for the route most closely resembling the No Build network corridor routes.

Table 3-1: Operating Characteristics of Corridor Routes

Route	Span of Service		Peak	Midday
4 Natural Bridge	4:00 a.m.	12:00 a.m.	40 min	40 min
11 Chippewa	4:00 a.m.	12:00 a.m.	20 min	20 min
74 Florissant	4:45 a.m.	1:00 a.m.	24 min	30 min
40X I-55 Express	5:00 a.m. 3:30 a.m.	8:30 a.m. 6:30 a.m.	48 min	--

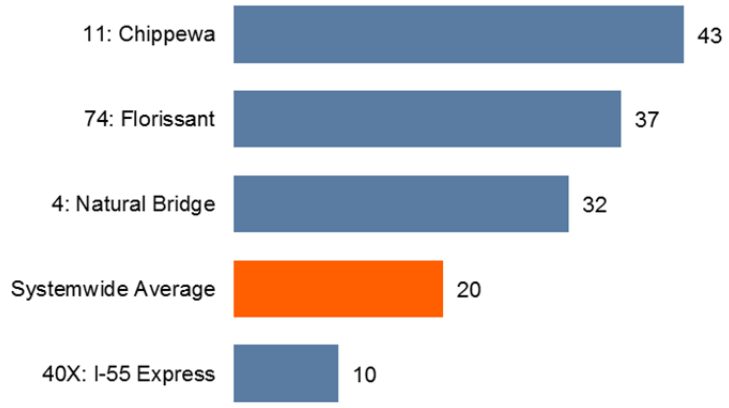
Source: Metro; span of service and headways as of August 2017.

Figure 3-1: Average October Weekday Boardings on Corridor Routes from 2012 to 2016



Source: Metro

Figure 3-2: Average Boardings per Trip on Corridor Routes in October 2016



Source: Metro

Other Connecting Routes

Twenty-five out of fifty MetroBus routes travel through the study area and would provide connections to the corridor. All routes would maintain existing service frequencies and schedules under the No Build Alternative. In addition, Metro operates Call-a-Ride paratransit services, which would continue to operate within the study area to qualified transit riders.

Stop/Station Locations and Spacing

The No Build Alternative assumes no changes to existing stop/station spacing along the corridor.

Stop/Station Facilities

There would be no changes to existing bus stop or rail station facilities for the No Build Alternative. Bus stop infrastructure and amenities vary along the corridor. Metro provides a range of bus stop facilities for riders, including shelters, seating, trash receptacles, and route and schedule information. However, many bus stops lack bus schedule and route information.

Runningway

The No Build Alternative would operate in mixed traffic (MetroBus) or guideway (MetroLink) following current Metro routes.

Transit Vehicles

The No Build Alternative would use existing buses and rail cars. Older vehicles would be replaced in compliance with FTA guidelines as funding is available.

Fare Collection

The No Build Alternative would continue to use current fare collection methods.

Technology / Customer Information

Technology and customer information systems that exist in the corridor would not be modified.

Identity / Branding

The No Build Alternative would not include any modifications to the existing identity or branding of vehicles.

Maintenance Facility

The Northside-Southside Study assumes that the bus and rail fleet for the No Build Alternative would be stored and maintained at the existing MetroBus and MetroLink facilities.

4.0 Build Alternatives by Segment: Station Locations and Runningway

As previously discussed, the corridor has been segmented to facilitate the detailed evaluation of alternatives and identify the most competitive (best performing) MOS. The two characteristics that will vary among segments include station locations and runningway design, as discussed in the following sections. All other elements of project definition are consistent along the length of the corridor, regardless of segment, and are described in Chapter 5.0 of this report.

Segment 1: Goodfellow Boulevard from near I-70 to Natural Bridge Avenue

Station Locations

One station is located in this segment between Stratford Avenue and I-70. This park-and ride facility would be designed for potential interoperability with the MetroNorth LRT alignment that will be studied through the St. Louis County transit investment study (Figure 2-1).

Runningway Design: 2008 LPA

The 2008 LPA recommended LRT operating in the median of Goodfellow Boulevard. Goodfellow Boulevard would have two through lanes in each direction, with left turn lanes at signalized intersections and a median where turn lanes would not be required. The 2008 LPA recommended locating the park-and-ride facility and terminal station on the west side of Goodfellow Boulevard. Due to a grade difference between Goodfellow Boulevard and the site of the park-and-ride facility in the 2008 LPA, the tracks would be elevated from the middle of Goodfellow Boulevard and would cross over southbound lanes of traffic. There would be a signalized intersection at the entrance to the Federal Center. All other driveways and cross streets would be converted to right-in/right-out.

Runningway Design: Potential Modifications to the 2008 LPA

The most significant change from the 2008 LPA is changing the location of the proposed park-and-ride facility and terminal station from the west to east side of Goodfellow Boulevard due to redevelopment since the 2008 Northside-Southside Study. Because the east side of Goodfellow Boulevard is lower than the west side, the tracks are proposed to cross the northbound lanes of Goodfellow Boulevard at-grade as trains enter the terminal station. The other change from the 2008 LPA would be to add either on-street parking or buffered bicycle lanes to the cross section. This would allow the curb to curb width to remain the same as it currently exists. It would also provide the opportunity to either maintain on-street parking in this portion of the corridor or add dedicated bicycle lanes, depending on feedback received from the public and stakeholders as the project moves forward. There would be signalized intersections at the entrance to the Federal Center, Stratford Avenue, and Amelia Avenue (which would provide access to the planned park-and-ride facility on the east side of Goodfellow Boulevard). All other driveways and cross streets would be converted to right-in/right-out.

Segment 2: Natural Bridge Avenue from Goodfellow Boulevard to Grand Boulevard

Station Locations

Five stations are located in this segment: Goodfellow Boulevard, Union Boulevard, Kingshighway Boulevard, Newstead Avenue, and Fair Avenue. The 2008 LPA recommended a single center platform for the Goodfellow Boulevard Station and split side platforms for the Union Boulevard, Kingshighway Boulevard, Newstead Avenue, and Fair Avenue stations (Figure 2-1).

Runningway Design: 2008 LPA

The 2008 LPA recommended LRT operating in the median of Natural Bridge Avenue. Natural Bridge Avenue would have two through lanes in each direction, with left turn lanes at signalized intersections and a median where turn lanes would not be required. The 2008 LPA recommended retrofitting the existing bridge over the St. Louis Belt and Terminal railroad tracks to be widened to accommodate the LRT and two through lanes in each direction. Beginning east of Union Boulevard Station, existing on-street parking lanes on Natural Bridge Avenue would be preserved between stations. Bicycle lanes were not proposed on Natural Bridge Avenue. There would be signalized intersections at Goodfellow Boulevard, Belt Avenue, Arlington Avenue, Union Boulevard, Kingshighway Boulevard, Shreve Avenue, Taylor Avenue, Newstead Avenue, Fair Avenue, and Vandeventer Avenue. All other driveways and cross streets would be converted to right-in/right-out.

On Natural Bridge Avenue between the Fair Avenue and Grand Boulevard stations, Sunday angle parking would be permitted, but would require closure of the outside traffic lane in each direction. A park-and-ride facility near the Newstead Avenue Station would be located on the south side of Natural Bridge Avenue between Newstead Avenue and Clarence Avenue. Additionally, the existing fire station on the north side of Natural Bridge Avenue between Union Boulevard and Geraldine Avenue would need to be relocated. The 2008 LPA recommended new curb lines for the entire length of the Segment 2 alignment.

Runningway Design: Potential Modifications to the 2008 LPA

One of the most significant changes from the 2008 LPA is that traffic lanes along Natural Bridge Avenue in each direction would be reduced to a single lane between Goodfellow Boulevard and Union Boulevard. This change from the 2008 LPA would also eliminate the need to widen the existing bridge over the St. Louis Belt and Terminal railroad for LRT use. East of Union Boulevard, Natural Bridge Avenue would have two travel lanes in each direction. On-street bicycle lanes would be maintained between Fair Avenue and Grand Boulevard.

A signalized crossing would be added at Chemline Inc., located at 5151 Natural Bridge Avenue, to accommodate loading dock access.

Segment 3: 2008 LPA Option (Florissant Avenue/14th Street)

Station Locations

Four stations are located in this segment: Grand Boulevard, Parnell Street, St. Louis Avenue, and Biddle Street. The 2008 LPA recommended split side platforms for the Grand Boulevard, Parnell Street, and St. Louis Avenue stations and parallel side platforms for the Biddle Street Station (Figure 2-2).

Runningway Design: 2008 LPA

The 2008 LPA recommended LRT operating in the median of Natural Bridge Avenue, continuing onto Palm Street, turning southeast onto North Florissant Avenue, then turning south onto North 14th Street to continue until turning east onto Delmar Boulevard. Natural Bridge Avenue, Palm Street, North Florissant Avenue, and North 14th Street would have two through lanes in each direction, with left turn lanes at signalized intersections and a median where turn lanes would not be required.

On Natural Bridge Avenue, there would be signalized intersections at Grand Boulevard, Glasgow Avenue, and Parnell Street. On North Florissant Avenue, there would be signalized intersections at Herbert Street, St. Louis Avenue, North Market Street, Madison Street, and Mullanphy Street. On North 14th Street, there would be a pedestrian signal at Biddle Street. All other driveways and cross streets would be converted to right-in/right-out.

On the north side of Natural Bridge Avenue, access to Bremen Avenue would be closed. On the north side of Palm Street, access to 25th Street, 23rd Street, Destrehan Street, and 22nd Street would be closed. On the west side of North Florissant Avenue, access to Rauschenbach Avenue, 21st Street, the alley between Sullivan Avenue and Dodier Street, and 19th Street would be closed. On the east side of North Florissant Avenue, access to 20th Street and 14th Street would be closed. On the west side of 14th Street, access to North 14th Street would be closed.

Parking on both sides of Palm Street would be maintained between 23rd Street and North Florissant Avenue.

The 2008 LPA recommended a bus transfer center on the west side of 14th Street between Dr. Martin Luther King Jr. Drive and Delmar Boulevard.

Runningway Design: Potential Modifications to the 2008 LPA

On Palm Street, between the Parnell Street and Florissant Avenue stations, on-street bicycle lanes would be added to match the existing condition. Additionally, on North 14th Street between Florissant Avenue and Dr. Martin Luther King Jr. Drive, traffic lanes in each direction would be reduced to single lane.

Another proposed change from the 2008 LPA is to change the Biddle Street Station configuration from a parallel side platform to a single center platform.

In addition, it is proposed that the project no longer include a bus transfer center on 14th Street between Dr. Martin Luther King Jr. Drive and Delmar Boulevard.

Segment 3: NGA Option 1 (St. Louis Avenue)

Station Locations

Four stations are located in this segment: Grand Boulevard, St. Louis Avenue, Florissant Avenue, and Biddle Street.

The Grand Boulevard Station is proposed to have a split platform, while the St. Louis Avenue, Florissant Avenue, and Biddle Street stations would have single center platforms. The St. Louis Avenue Station

would be located in the median of Parnell Street. The Florissant Avenue Station would be in the median of Florissant Avenue, while the Biddle Street Station would be in the median of 14th Street.

Runningway Design

The NGA alignment option on St. Louis Avenue (NGA Option 1) is proposed to have LRT operating in the median of Natural Bridge Avenue, turning south onto Parnell Street, turning east onto St. Louis Avenue, and then turning south onto North Florissant Avenue to North 14th Street. Natural Bridge Avenue and St. Louis Avenue would have a single through lane in each direction. Natural Bridge Avenue would have bicycle lanes/sharrows and on-street parking. There would be two lanes in each direction on Parnell Avenue and no station at the intersection of Natural Bridge Avenue and Parnell Street. St. Louis Avenue would have a single through lane/sharrow in each direction. Signalized intersections would be at the intersections of:

- Natural Bridge Avenue and Grand Boulevard
- Natural Bridge Avenue and Glasgow Avenue
- Natural Bridge Avenue, Palm Street, Parnell Street, and Salisbury Street
- Parnell Street and St. Louis Avenue
- St. Louis Avenue and North 22nd Street
- St. Louis Avenue and North 20th Street
- St. Louis Avenue and North Florissant Avenue
- North Florissant Avenue and North Market Street
- North Florissant Avenue and Madison Street
- North Florissant Avenue and North 14th Street
- North 14th Street and Cass Avenue
- North 14th Street and Biddle Street
- North 14th Street and Dr. Martin Luther King Jr. Drive

All other driveways and cross streets would be converted to right-in/right-out.

In addition, it is proposed that the project no longer includes a bus transfer center on 14th Street between Dr. Martin Luther King Jr. Drive and Delmar Boulevard.

Segment 3: NGA Option 2 (Delmar Boulevard)

Station Locations

Four stations are located in this segment: Grand Boulevard, Parnell Street, Cass Avenue, and Dr. Martin Luther King Jr. Drive.

The Grand Boulevard, Cass Avenue, and Dr. Martin Luther King Jr. Drive stations would have split platforms. The Parnell Street Station would have a center platform in the median of Natural Bridge Avenue (Figure 2-2).

Runningway Design

The NGA alignment option on Delmar Boulevard (NGA Option 2) is proposed to have LRT operating in the median of Natural Bridge Avenue, turning south onto Parnell Street, continuing onto Jefferson Avenue, and then turning east onto Delmar Boulevard to North 14th Street. Parnell Street and Jefferson Avenue would have two through lanes in each direction. Natural Bridge Avenue and Delmar Boulevard would have a single through lane in each direction. Signalized intersections would be at the intersections of:

- Natural Bridge Avenue and Grand Boulevard
- Natural Bridge Avenue and Glasgow Avenue
- Natural Bridge Avenue, Palm Street, Parnell Street, and Salisbury Street
- Parnell Street and St. Louis Avenue
- Jefferson Avenue and Cass Avenue
- Jefferson Avenue and Dr. Martin Luther King Jr. Drive
- Jefferson Avenue and Delmar Boulevard
- Delmar Boulevard and North 20th Street
- Delmar Boulevard and North 18th Street

All other driveways and cross streets would be converted to right-in/right-out.

In addition, it is proposed that the project no longer includes a bus transfer center on 14th Street between Dr. Martin Luther King Jr. Drive and Delmar Boulevard.

Segment 4: 14th Street/Convention Plaza to Park Avenue Station

Station Locations

Seven stations are located in this segment: Delmar Boulevard, Washington Avenue, Pine Street, Clark Avenue, 14th Street, Truman Parkway, and Park Avenue.

The 2008 LPA recommended single center platforms for the Delmar Boulevard, 14th Street, and Park Avenue stations; side platforms parallel to one another on 9th and 10th Streets for the Washington Avenue, Pine Street, and Clark Avenue stations; and a split side platform for the Truman Parkway Station (Figure 2-3).

Runningway Design: 2008 LPA

The 2008 LPA recommended LRT operating in the median of Delmar Boulevard, continuing onto Convention Plaza then transitioning from the median to operate on the west side of 9th Street (northbound) and the east side of 10th Street (southbound) as a one-way pair through downtown Saint Louis, then turning west and transitioning to operate in the median of Clark Avenue. The LRT would transition from the median to operate on the north side of Clark Avenue west of 11th Street. The recommended alignment would then turn south onto 14th Street and connect to the existing MetroLink station at the proposed Multi-Modal Transit Center (MMTC) Station, and continue to operate side-running on the west side of 14th Street, then transition to operate in the median of Chouteau Avenue, and would continue until turning south onto Jefferson Avenue.

Delmar Boulevard and Convention Plaza would have one through lane in each direction, with the ability to turn left at signalized intersections. Ninth Street and 10th Street would have two through lanes and the ability to turn left at signalized intersections. On Clark Avenue, there would be one through lane in each direction with the ability to turn left at signalized intersections. On the north side of Clark Avenue west of 10th Street, a one-way westbound lane would provide building access with right-in/right-out movements only. After transitioning to side-running operations at 11th Street, Clark Avenue would have two through lanes in each direction with left turn lanes at the I-64/I-40 on-ramp and signalized intersections. On 14th Street between Clark Avenue and Spruce Street, there would be two through lanes in each direction with left turn lanes at intersections. On 14th Street south of Spruce Street, there would be two northbound through lanes. Chouteau Avenue and Jefferson Avenue would have two through lanes in each direction, with left turn lanes at signalized intersections and a median where turn lanes would not be required.

Delmar Boulevard and Convention Plaza would share a signalized intersection with North Tucker Boulevard. Convention Plaza would have signalized intersections at 11th Street, 10th Street, and 9th Street. Ninth Street and 10th Street would have signalized intersections at Washington Avenue, Locust Street, Olive Street, Pine Street, Chestnut Street, Market Street, Walnut Street, and Clark Avenue. Additionally, 10th Street would have a signalized intersection at Lucas Avenue. Clark Avenue would have signalized intersections at 11th Street, South Tucker Boulevard, and 14th Street. Fourteenth Street would have signalized intersections at the LRT entrance to MMTC and at Chouteau Avenue. Chouteau Avenue would have signalized intersections at Truman Parkway, the entrance to Ameren Services, and Jefferson Avenue. Within Segment 3, Jefferson Avenue would have a signalized intersection at Park Avenue. All other driveways and cross streets would be converted to right-in/right-out.

On the west side of 9th Street, access to Lucas Avenue would be permanently closed. Between 9th Street and 10th Street, access to St. Charles Street and the alley between Olive Street and Pine Street would be permanently closed. The entrance to the parking lot on Clark Avenue between South Tucker Boulevard and 14th Street would be permanently closed, requiring reconfiguration of the lot.

One parking lane on the south side of Clark Avenue would be preserved between 11th Street and 14th Street. The parking lane on the north side of Clark Avenue would be removed between South Tucker Boulevard and 14th Street.

The 2008 LPA recommended the reconfiguration and partial reconstruction of an MMTC near the existing Civic Center Station and modification of the 14th Street bridge for LRT tracks. The 2008 LPA also recommended the addition of automatic signage for advance warning of trains approaching at parking entrances on 9th Street and 10th Street. Right-of-way acquisition would be required on the north side of Chouteau Avenue between St. Ange Avenue and South 17th Street and between 18th Street and the entrance to Ameren Services. Right-of-way acquisition would also be required on the west side of Jefferson Avenue between Rutger Street and Park Avenue. The existing fire station on the west side of Jefferson Avenue between LaSalle Street and Hickory Street would need to be relocated.

Runningway Design: Potential Modifications to the 2008 LPA – Option 1

One of the changes from the 2008 LPA is to adjust the lane configuration in downtown Saint Louis. On 10th Street, there would be three through lanes between Clark Avenue and Walnut Street, and two through lanes with on-street parking between Walnut Street and Market Street. Additionally, on-street parking would be maintained on 9th Street between Clark Street and Walnut Street.

Another modification to the 2008 LPA is having LRT operate in the center of Clark Avenue, allowing right turning movements into the parking ramps located on the north side of the street between Tucker Boulevard and 10th Street without crossing the tracks. This would require the relocation of the northbound Clark Avenue Station platform to 10th Street north of Clark Avenue to better accommodate track geometry. Additionally, the Truman Parkway Station configuration would be changed from a split side platform to a single center platform west of Truman Parkway.

On 14th Street, the LRT would operate on the east side of the street between Clark Avenue and Chouteau Avenue, allowing for vehicles exiting I-64 to turn both north and south, without crossing the tracks. This would require closing the 14th Street access to the Sheraton Hotel parking/maintenance area. Access to this area would be maintained via Spruce Street.

On the 14th Street bridge, a significant change from the 2008 LPA is the need to fit the alignment within the existing right-of-way. In order to avoid widening the bridge, cross-sectional elements would be adjusted to fit within the existing structure width. The guideway would be located on the east side of the bridge, supported by side overhead catenary system poles. The 14th Street bridge would be reduced to one through lane in each direction.

Since 2008, Chouteau Avenue has been reduced from a four-lane road with parking to a three-lane road with bicycle lanes and parking in some locations. The LRT would operate in the median of Chouteau Avenue, with one lane of traffic in each direction and bicycle lanes or sharrows. On Jefferson Avenue, the proposed changes include LRT operating in the median with two through lanes in each direction. It is anticipated that on-street parking would be removed along Jefferson Avenue.

Runningway Design: Potential Modifications to the 2008 LPA – Option 2

The second option for Segment 4 is the same as the first option with one exception. The alignment approaching North 11th Street would turn diagonally across the existing surface parking lot that is bounded by Convention Plaza, North 11th Street, North 10th Street, and Lucas Avenue. The southbound tracks would cross the intersection of North 10th Street and Lucas Avenue, and follow the alignment discussed in the first option. The northbound tracks would cross the intersection of North 10th Street and Lucas Avenue and Lucas Avenue to North 9th Street then follow the alignment discussed in the first option along North 9th Street.

Segment 5: Park Avenue Station to Chippewa Street Station

Station Locations

Five stations are located in this segment: Russell Boulevard, Gravois Avenue, Arsenal Street, Cherokee Street, and Chippewa Street. The 2008 LPA recommended split side platforms for the Russell Boulevard, Gravois Avenue, Arsenal Street, Cherokee Street, and Keokuk Street stations. The Keokuk Street Station would be shifted one block north to Chippewa Street to provide better connections to existing bus service and to take advantage of wider right-of-way at Chippewa Street.

Runningway Design: 2008 LPA

The 2008 LPA recommended light rail operating in the median of Jefferson Avenue. Jefferson Avenue would have two through lanes in each direction, with left turn lanes at signalized intersections and a

median where turn lanes would not be required. Parking lanes on both sides of Jefferson Avenue would remain between Lynch Street and Crittenden Street.

Jefferson Avenue would have signalized intersections at Eads Avenue, Lafayette Avenue, I-44 interchange, Russell Boulevard, Shenandoah Avenue, Gravois Avenue, Arsenal Street, Cherokee Street, Miami Street, Chippewa Street, and Keokuk Street. There would be a proposed pedestrian signal at the intersection of Jefferson Avenue and Wyoming Street. On the west side of Jefferson Avenue, access to Sidney Street would be permanently closed. All other driveways and cross streets would be converted to right-in/right-out.

The 2008 LPA also proposed to relocate St. Louis Fire Department Engine House number 7.

Runningway Design: Potential Modifications to the 2008 LPA

The recommended changes to Segment 5 focus on reducing the footprint and reducing the need for right-of-way purchases. Jefferson Avenue would have two through lanes in each direction, but on-street parking would be removed.

Additionally, the station located at Keokuk Street in the 2008 LPA would be moved to Chippewa Street, and the station platform configuration would be changed from a split side platform to a single center platform.

It is recommended that, rather than relocating St. Louis Fire Department Engine House number 7, the driveway to the fire house would be signalized and the signals would be integrated with the LRT signal systems. In addition, the track and guideway in front of the fire house would be designed to allow emergency vehicles to cross the tracks.

Segment 6: Chippewa Street Station to Loughborough Avenue Station[4]

Station Locations

Three stations are located in this segment: Broadway, Bates Street, and Loughborough Avenue. The 2008 LPA recommended single center platforms for the Broadway and Bates Street stations and split side platforms for the Loughborough Avenue Station. The Broadway Station would have an adjacent park-and-ride facility.

Runningway Design: 2008 LPA

The 2008 LPA recommended LRT operating in the median of Jefferson Avenue, then transitioning to operate adjacent to the west side of I-55, crossing to the east side of I-55 south of the Bates Street Station, and terminating at the Bayless Avenue Station. Due to grade differences throughout the alignment alongside I-55, the tracks would be elevated and depressed as necessary until terminating at the Bayless Avenue Station.

[4] As previously noted, it is likely that the outcome of the Northside-Southside Study will be an LPA with a MOS, which will be the first phase of investment in the full 17-mile corridor. Following selection of the MOS, further evaluation should be conducted to determine whether the alignment along Broadway better meets the purpose and need of the Northside-Southside Study than the alignment along I-55, which was identified as the LPA during the 2008 study.

South Broadway would have two through lanes in each direction, with left turn lanes at signalized intersections and a median where turn lanes would not be required. There would be signalized intersections at South Broadway and Keokuk Street and South Broadway and Gasconade Street. On the east side of Piedmont Avenue, access to Judith Court would be permanently closed; access to Judith Court would be provided from Gasconade Street. All other driveways and cross streets along Broadway would be converted to right-in/right-out.

At the intersection of Gasconade Street, South Broadway, and Piedmont Avenue, the 2008 LPA would transition from South Broadway to Piedmont Avenue to connect to the I-55 right-of-way. The 2008 LPA would then follow I-55 south. The 2008 LPA would bridge over the interchange of I-55 and South Broadway, Bates Street, and Virginia Avenue, then bridge over I-55. The existing Holly Hills bridge over I-55 would need to be modified to allow the LRT to pass under the bridge. There would be an at-grade crossing of Loughborough Avenue.

The 2008 LPA recommended removing two pedestrian bridges over I-55; however, since 2008 those pedestrian bridges have been removed.

South Broadway Option

In addition to the 2008 LPA, Aldermen from the City of St. Louis have expressed interest in an option that continues on South Broadway, rather than follow I-55. This option will be examined in subsequent studies.

Runningway

The right-of-way along Broadway from I-55 to Dover Street is approximately 80 feet wide, with a curb-to-curb width of 60 feet. South of Dover Street, the Broadway right-of-way narrows to 70 feet, with a curb-to-curb width of 50 feet. Currently, Broadway has one travel lane in each direction, a center turn lane, and on-street parking. Dedicated bicycle lanes are north of Dover Street.

In-street running light rail would most likely operate in the median of Broadway, with one travel lane in each direction. It is anticipated that either bicycle lanes or on-street parking on one side of the street could be maintained in areas north of Dover Street where there are no stations. Additional right-of-way and/or narrower sidewalks would be required near stations and signalized intersections. Median running light rail would limit automobiles crossing the tracks to signalized intersections. The remainder of the cross streets and driveways along Broadway would become right-in/right-out.

The I-55 and Bellerive Boulevard bridges over South Broadway would likely need to be reconstructed to accommodate LRT passing under them. It is anticipated that new bridges would be required over a freight railroad track south of Tesson Street and the River des Peres.

The South Broadway Option will be explored further in future phases of the project.

Segment 7: Loughborough Avenue Station to Bayless Avenue Station

Station Location

There is one proposed station located in this segment at Bayless Avenue. This station would include a park-and-ride facility.

Runningway Design: 2008 LPA

The 2008 LPA recommended continuing south within the I-55 right-of-way crossing over Union Pacific railroad tracks, Koeln Avenue, Germania Street, River des Peres, Carondelet Boulevard, the on ramp for the Weber Road interchange, and Bayless Avenue

5.0 Build Alternatives: Characteristics that are Consistent among the Alternatives

As discussed in Chapter 4.0, the two characteristics that will vary among segments include station locations and runningway design. All other elements of project definition are consistent along the length of the corridor, regardless of segment, and are described below.

Station Facilities

Station facilities on the Northside-Southside light rail will be different in design and appearance than most existing MetroLink stations. All Northside-Southside stations will be at street level, rather than below grade, like many existing MetroLink stations. It is anticipated that the majority of the Northside-Southside route would operate in the middle of the roadway, where feasible from an operational and constructability perspective. Consequently, most station platforms would be located in the center of the roadway. An example of what this could look like is shown on Figure 5-1. Most stations would likely consist of one platform that serves both northbound and southbound riders. In areas with constrained right-of-way, split platforms (where narrower northbound and southbound platforms are on opposite sides of an intersection) may be designed.

All station platforms would be located at signalized intersections with marked crosswalks to ensure safe access by pedestrians.

Figure 5-1: Green Line LRT Center Station, St. Paul, MN

Station design and amenities would vary by location, but would generally include:

- A high-quality canopy with significant weather protection elements
- Ticket vending machines

- Seating
- Bicycle parking and bicycle sharing facilities as appropriate
- Parking (likely only at end-of-line stations)
- Other multimodal facilities, such as bus stops and passenger drop-off areas, shuttle and taxi zones
- Real-time arrival information on variable message boards
- Route and schedule information
- Platform/shelter lighting
- Emergency phone
- Camera surveillance

Transit Vehicles

Existing MetroLink LRT vehicles are powered through an overhead catenary system. The vehicles are designed for level boarding at raised platforms and run as two-car trains. However, there are different options for LRT vehicles, including a hybrid model that can use a combination of overhead catenary and battery power. This type of vehicle can run for up to two miles at a time on battery power. Battery powered operation could eliminate the need for poles and overhead wires in the downtown area, which may also reduce capital costs and visual impacts.

Figure 5-2: Siemens S70 Vehicle used in Charlotte, NC

Figure 5-2 shows the type of light-rail vehicle that is planned for operations in Charlotte, North Carolina; it will operate wire-free through their Uptown neighborhood.

Other features of the cars are:

- Potential storage capacity for multiple bicycles
- Americans with Disabilities (ADA) accessibility
- Exterior windows tinted to reduce glare
- Seating for 140 passengers

As wireless technology improves and battery lives extend, the study team will stay on the forefront of emerging technology and incorporate these advances into system design, operations, and costing.

Fare Collection

The build alternatives would use a proof of payment fare collection system. This would occur off-board and include ticket vending machines on station platforms, platform validation devices, and point-of-sale devices with smartcard personalization capability. Fare enforcement personnel would perform ticket validation checks of riders, and would issue citations for those found to be riding without proper proof of fare payment.

Current MetroLink stations are often below-grade, which provides a natural control for access; the Northside-Southside LRT would operate at street-level, which is not conducive to barrier-based fare

collection. In fact, there is not an existing street-level LRT system in the country that uses barrier-based fare payment at center platform station locations.

Figure 5-3 shows a sign that Metro Transit uses in the Twin Cities to delineate the paid fare zone.

Figure 5-4 shows a Twin Cities' LRT platform with fare vending equipment.

Based on a review of peer light rail and streetcar systems in the United States, virtually all light rail and streetcar systems in the United States have a barrier-free system and utilize proof of payment.

Figure 5-3: Example Paid Fare Zone Sign

The cost associated with designing and constructing closed stations is the primary reason why proof of payment and open stations have gained popularity for rail systems that operate in-street and at-grade. Light rail stations are generally built with open platforms that allow people easy access to the transit system.

Even closed stations that control access with barriers and turn styles are vulnerable to individuals who want to access a platform without paying a fare by jumping the turn styles and/or walking along the tracks and jumping onto the platform. The only way to stop this behavior would be to have staff at the stations to deter people from accessing the platform at places other than the intended access points. If the transit system operated a proof of payment system, these same staff resources could be applied to fare enforcement. Proof of payment systems also discourage people from walking along tracks to access platforms, which increases overall safety.

Figure 5-4: Twin Cities' LRT Platform and Fare Vending Machine

Technology/Customer Information

The build alternatives would take advantage of technology to improve transit travel, reliability, and customer experience. Specifically, it assumes the use of variable messaging signs at each station, which would show - in real-time - when the next train will arrive (see Figure 5-5).

Figure 5-5: Real-Time Arrival Information

Identity/Branding

Stations and vehicles would be branded with new and unique signage. While there would be some general variation in scale and design to fit the context of the area in which it is located, it is anticipated that each station would include a highly visible or easily identifiable element.

Possible Maintenance Facility Locations

See Appendix A: Maintenance Facility Memo.

Safety and Security

Recent increases in crime along existing MetroLink routes have heightened awareness of safety and security on transit. As the Northside-Southside LRT vehicles, platforms, and station areas are defined, best practices in safety and security planning will be integrated, including the consideration of infrastructure, technology, and personnel tools. Public engagement activities would provide insight into community concerns regarding safety, and would help influence system design.

6.0 Build Alternatives: Service Plans

There are three service plans proposed for the full build alternative, corresponding with each of the NGA alignment options. All three plans would operate the same bus network, and only vary in the pattern and timing of the Northside-Southside light rail service. Each proposed alternative alignment would operate with the same frequency and schedule as the existing MetroLink as outlined in Table 6-1.

Table 6-1: Proposed Service Schedule

	Span of Service	Service Headway
Weekday	5:00 a.m. – 6:30 a.m.	20 minutes
	6:30 a.m. – 9:30 a.m.	12 minutes
	9:30 a.m. – 2:30 p.m.	20 minutes
	2:30 p.m. – 6:30 p.m.	12 minutes
	6:30 p.m. – 1:00 a.m.	20 minutes
Saturday/Sunday/Holiday	6:00 a.m. – 1:00 a.m.	20 minutes

Station to station light rail travel times for each of the proposed build alternatives are shown in Table 6-2. The 2008 LPA Option would have a route length of 16.9 miles and require a minimum of eight vehicles operating 96 minute cycles during peak service. NGA Option 1 would have a route length of 17.0 miles and require a minimum of eight vehicles operating 96 minute cycles during peak service. NGA Option 2 would have a route length of 17.1 miles and require a minimum of eight vehicles operating 96 minute cycles during peak service.

Table 6-2: 2008 LPA Service Plan

2008 LPA Southbound	Run Time	2008 LPA Northbound	Run Time	NGA-1 Southbound	Run Time	NGA-1 Northbound	Run Time	NGA-2 Southbound	Run Time	NGA-2 Northbound	Run Time
Goodfellow @ Stratford	0:00:00	I-55 NB Ramps @ Bayless	0:00:00	Goodfellow @ Stratford	0:00:00	I-55 NB Ramps @ Bayless	0:00:00	Goodfellow @ Stratford	0:00:00	I-55 NB Ramps @ Bayless	0:00:00
Natural Bridge @ Goodfellow	0:01:59	I-55 NB Ramps @ Loughborough	0:03:00	Natural Bridge @ Goodfellow	0:01:59	I-55 NB Ramps @ Loughborough	0:03:00	Natural Bridge @ Goodfellow	0:01:59	I-55 NB Ramps @ Loughborough	0:03:00
Natural Bridge @ Union	0:04:00	I-55 SB Ramps @ Bates	0:04:50	Natural Bridge @ Union	0:04:00	I-55 SB Ramps @ Bates	0:04:50	Natural Bridge @ Union	0:04:00	I-55 SB Ramps @ Bates	0:04:50
Natural Bridge @ Kingshighway	0:05:14	I-55 SB and Oceola	0:07:00	Natural Bridge @ Kingshighway	0:05:14	I-55 SB and Oceola	0:07:00	Natural Bridge @ Kingshighway	0:05:14	I-55 SB and Oceola	0:07:00
Natural Bridge @ Newstead	0:07:25	S. Jefferson @ Chippewa	0:08:50	Natural Bridge @ Newstead	0:07:25	S. Jefferson @ Chippewa	0:08:50	Natural Bridge @ Newstead	0:07:25	S. Jefferson @ Chippewa	0:08:50
Natural Bridge @ Fair	0:08:47	S. Jefferson @ Cherokee	0:10:15	Natural Bridge @ Fair	0:08:47	S. Jefferson @ Cherokee	0:10:15	Natural Bridge @ Fair	0:08:47	S. Jefferson @ Cherokee	0:10:15
Natural Bridge @ Grand	0:10:38	S. Jefferson @ Arsenal	0:11:29	Natural Bridge @ Grand	0:10:38	S. Jefferson @ Arsenal	0:11:29	Natural Bridge @ Grand	0:10:38	S. Jefferson @ Arsenal	0:11:29
Natural Bridge @ Parnell	0:12:00	S. Jefferson @ Gravois	0:12:45	Parnell @ St. Louis	0:12:34	S. Jefferson @ Gravois	0:12:45	Natural Bridge @ Parnell	0:12:00	S. Jefferson @ Gravois	0:12:45
Florissant @ St. Louis	0:14:09	S. Jefferson @ Russell	0:14:03	Florissant @ St. Louis	0:14:10	S. Jefferson @ Russell	0:14:03	N. Jefferson @ Cass	0:14:07	S. Jefferson @ Russell	0:14:03
14th @ Biddle	0:16:34	S. Jefferson @ Park	0:15:27	14th @ Biddle	0:16:36	S. Jefferson @ Park	0:15:27	Jefferson @ Delmar	0:15:39	S. Jefferson @ Park	0:15:27
14th @ Delmar	0:17:40	Chouteau @ Grattan	0:17:31	14th @ Delmar	0:17:42	Chouteau @ Grattan	0:17:31	14th @ Delmar	0:17:47	Chouteau @ Grattan	0:17:31
10th @ Washington	0:18:58	14th @ Clark	0:19:13	10th @ Washington	0:19:00	14th @ Clark	0:19:13	10th @ Washington	0:19:05	14th @ Clark	0:19:13
10th @ Pine	0:20:35	9th @ Clark	0:21:51	10th @ Pine	0:20:37	9th @ Clark	0:21:51	10th @ Pine	0:20:42	9th @ Clark	0:21:51
10th @ Clark	0:22:38	9th @ Pine	0:23:54	10th @ Clark	0:22:39	9th @ Pine	0:23:54	10th @ Clark	0:22:45	9th @ Pine	0:23:54
14th @ Clark	0:24:53	9th @ Washington	0:25:31	14th @ Clark	0:24:54	9th @ Washington	0:25:31	14th @ Clark	0:25:00	9th @ Washington	0:25:31
Chouteau @ Grattan	0:26:35	14th @ Delmar	0:26:57	Chouteau @ Grattan	0:26:36	14th @ Delmar	0:26:57	Chouteau @ Grattan	0:26:42	14th @ Delmar	0:26:57
S. Jefferson @ Park	0:28:38	14th @ Biddle	0:28:03	S. Jefferson @ Park	0:28:40	14th @ Biddle	0:28:03	S. Jefferson @ Park	0:28:46	Jefferson @ Delmar	0:29:05
S. Jefferson @ Russell	0:30:03	Florissant @ St. Louis	0:30:29	S. Jefferson @ Russell	0:30:05	Florissant @ St. Louis	0:30:29	S. Jefferson @ Russell	0:30:10	N. Jefferson @ Cass	0:30:38
S. Jefferson @ Gravois	0:31:21	Natural Bridge @ Parnell	0:32:37	S. Jefferson @ Gravois	0:31:23	Parnell @ St. Louis	0:32:05	S. Jefferson @ Gravois	0:31:28	Natural Bridge @ Parnell	0:32:44
S. Jefferson @ Arsenal	0:32:37	Natural Bridge @ Grand	0:34:00	S. Jefferson @ Arsenal	0:32:39	Natural Bridge @ Grand	0:34:01	S. Jefferson @ Arsenal	0:32:44	Natural Bridge @ Grand	0:34:07
S. Jefferson @ Cherokee	0:33:51	Natural Bridge @ Fair	0:35:50	S. Jefferson @ Cherokee	0:33:53	Natural Bridge @ Fair	0:35:52	S. Jefferson @ Cherokee	0:33:58	Natural Bridge @ Fair	0:35:57
S. Jefferson @ Chippewa	0:35:16	Natural Bridge @ Newstead	0:37:12	S. Jefferson @ Chippewa	0:35:18	Natural Bridge @ Newstead	0:37:14	S. Jefferson @ Chippewa	0:35:23	Natural Bridge @ Newstead	0:37:19
I-55 SB and Oceola	0:37:06	Natural Bridge @ Kingshighway	0:39:24	I-55 SB and Oceola	0:37:07	Natural Bridge @ Kingshighway	0:39:25	I-55 SB and Oceola	0:37:13	Natural Bridge @ Kingshighway	0:39:31
I-55 SB Ramps @ Bates	0:39:16	Natural Bridge @ Union	0:40:37	I-55 SB Ramps @ Bates	0:39:18	Natural Bridge @ Union	0:40:39	I-55 SB Ramps @ Bates	0:39:23	Natural Bridge @ Union	0:40:44
I-55 NB Ramps @ Loughborough	0:41:06	Natural Bridge @ Goodfellow	0:42:38	I-55 NB Ramps @ Loughborough	0:41:08	Natural Bridge @ Goodfellow	0:42:40	I-55 NB Ramps @ Loughborough	0:41:13	Natural Bridge @ Goodfellow	0:42:45
I-55 NB Ramps @ Bayless	0:44:06	Goodfellow @ Stratford	0:44:37	I-55 NB Ramps @ Bayless	0:44:08	Goodfellow @ Stratford	0:44:39	I-55 NB Ramps @ Bayless	0:44:13	Goodfellow @ Stratford	0:44:44

Build Alternative Bus Network

All three NGA alignment options would utilize the same underlying bus network as described in this section. Out of 83 routes in operation, 72 would remain similar to existing service. The following sections detail the 11 routes that would require modification under the build alternative and the 14 routes that would connect to the build alternative at locations other than the Civic Center Station[5] downtown. While these routes are fundamentally unaltered, they may require some schedule timing adjustments and refinement under the next project phase.

Route 4 (Natural Bridge) – Operates between North Hanley Transit Center, UMSL South Station, and the Civic Center Station along North Hanley Road, Natural Bridge Avenue, Parnell Street, Jefferson Avenue, Market Street, and 14th Street. The existing routing overlays the Northside-Southside light rail for 3.9 miles along Natural Bridge Avenue and 1.5 miles on Parnell Street/Jefferson Avenue for NGA Option 2. The south end of the route connects to the Civic Center Station.

Under the build alternatives, Route 4 would operate between North Hanley Transit Center and the Natural Bridge Avenue at Grand Boulevard Station as currently configured. The proposed changes for Route 4 would end the route with a short circular that connects strong neighborhood stops to proposed Northside-Southside stations. From Natural Bridge Avenue at Grand Boulevard the route would continue east on Natural Bridge Avenue, south on Parnell Street, east on St. Louis Avenue, south on 13th Street, west on Howard Street, south on Blair Avenue, west on Carr Street, and north on 20th Street to St. Louis Avenue. Route 4 would retain a 40 minute frequency during peak and midday service.

Route 8 (Bates-Morganford) – Operates between the Civic Center Station and the Catalan Transit Center along 14th Street, Chouteau Avenue, Tucker Boulevard/Gravois Avenue, Russell Boulevard, Grand Boulevard, Shaw Boulevard, Tower Grove Avenue, Morganford Road, Bates Street, Holly Hills Boulevard, Loughborough Avenue, and South Broadway. The existing route overlays the proposed Northside-Southside alignment for 0.4 mile along South 14th Street and crosses the proposed alignment at Jefferson Avenue at Russell Boulevard and I-55 at Loughborough Avenue.

The build alternative would transform this route from a crosstown to a neighborhood route feeding the Loughborough Avenue and Chippewa Street stations. The route would follow the existing pattern along South Broadway, Loughborough Avenue, and Holly Hills Boulevard. From Holly Hills Boulevard, it would travel north on Leona Street, west on Bates Street, north on Morganford Road, and east on Chippewa Street to the Chippewa Street at Jefferson Avenue Station. Route 8 would maintain its existing 40 minute peak and 60 minute midday frequencies. This route would combine with Route 11 to achieve more frequent service along the portion of Chippewa Street between Morganford Road and Jefferson Avenue.

Route 10 (Gravois-Lindell) – Operates between Central West End Station, Civic Center Station, and the Hampton-Gravois Transit Center along Kingshighway Boulevard, Lindell Boulevard, Olive Street, 14th

[5] Routes 40 (N Broadway), 78 (Larimore), 96 (Market Street Shuttle), 58X (Twin Oaks Express), 174X (North Express), and 410X (Eureka Express) connect to the proposed alignment only at the Civic Center Station. In addition, select runs 1X, 14X, and 16X may also interact at the Convention Center Station. However, because these routes do not interact in a feeder capacity to the proposed alignment and due to the large number of other transfer opportunities at the Convention Center Station, these routes would not be targeted for schedule adjustments as a result of the project and are not discussed in detail here.

Street, Chouteau Avenue, and Tucker Boulevard/Gravois Avenue. The existing route connects to the proposed Northside-Southside alignment at the Civic Center Station and at Jefferson Avenue at Gravois Avenue.

No changes to routing, frequency, or schedule are recommended under the build alternative.

Route 11 (Chippewa) – Operates between the Civic Center Station and the Shrewsbury-Lansdowne I-44 Station along Market Street, 14th Street, Chouteau Avenue, Jefferson Avenue, Winnebago Street, South Broadway, Chippewa Street, and Lansdowne Avenue. The existing route overlays the proposed Northside-Southside alignment 3.7 miles along 14th Street, Chouteau Avenue, and Jefferson Avenue.

The build alternative bus recommendations include a route that combines portions of Route 11 and Route 21. The route would follow the existing Route 21 from St. Louis Community College (STLCC) Meramec Campus to the Shrewsbury-Lansdowne I-44 Station. From there it would continue east on Lansdowne Avenue, east on Chippewa Street, and terminate at the proposed station at South Jefferson Avenue and Chippewa Street. The portion of the existing route north on South Jefferson Avenue into downtown would be served by the proposed Northside-Southside alignment. This route would maintain the 20 minute peak/40 minute midday frequencies currently provided on Route 21. An overlay with Route 8 would be used to achieve more frequent service along the portion of Chippewa Street between Morganford Road and Jefferson Avenue.

Route 13 (Union) – Operates between Calvary Avenue and Central West End Station along Union Boulevard, Lindell Boulevard, and Taylor Avenue. The existing route connects to the proposed Northside-Southside alignment at Natural Bridge Avenue and Union Boulevard.

No changes to routing, frequency, or schedule are recommended under the build alternative

Route 16 (City Limits) – Operates between Riverview Transit Center and Shrewsbury-Lansdowne I-44 Station along Riverview Boulevard, Jennings Station Road, Skinker Parkway, Belleview Avenue, and Jamieson Avenue. The existing route pattern does not interact with the proposed Northside-Southside alignment but operates in parallel to Goodfellow Boulevard on the north end of the proposed alignment.

As part of the build alternative this route would deviate 0.7 mile along Stratford Avenue to provide a connection to the proposed station at Goodfellow Boulevard and I-70. This route would retain a 30 minute frequency during peak and midday service.

Route 18 (Taylor) – Operates between the Broadway-Taylor Transit Center and Central West End Station along Taylor Avenue, Florissant Avenue, Pope Avenue, Newstead Avenue, and Taylor Avenue. The existing route connects to the proposed Northside-Southside alignment at Natural Bridge Avenue and Newstead Avenue.

No changes to routing, frequency, or schedule are recommended under the build alternative.

Route 19 (St. Louis Ave.) – Operates between the Rock Road Station and the Civic Center Station along St. Charles Street, Rock Road, Lucas-Hunt Road, St. Louis Avenue, Kienlen Avenue, Dr. Martin Luther King Jr. Drive, Goodfellow Boulevard, St. Louis Avenue, 13th Street, Howard Street, and 14th Street. The existing route connects to the proposed Northside-Southside alignment at Florissant Avenue and 14th Street and at the Civic Center Station.

This route would deviate from its existing pattern at two locations for the build alternative. From St. Louis Avenue and Kienlen Avenue, the route would turn north to Natural Bridge Avenue, where it would

continue east to the proposed station at Goodfellow Boulevard and Natural Bridge Avenue, then south on Goodfellow Boulevard to St. Louis Avenue where it would resume existing services. At St. Louis Avenue and Parnell Street, the route would turn south onto Parnell Street, east on Market Street, and south on 14th Street to the Civic Center Station. As configured, Route 19 would provide direct service between the planned NGA facility to downtown rail and transfer connections. This route would operate every 30 minutes during peak service and every 40 minutes during the midday.

Route 20 (South Broadway) – Operates between the Civic Center Station, Catalan Transit Center, the VA Hospital, and South County Mall along 14th Street, Chouteau Avenue, Tucker Boulevard, 12th Street, Lynch Street, South Broadway/Telegraph Road, Kinswood Lane, Koch Road, Forder Road, and Lemay Ferry Road. The existing route overlays the proposed Northside-Southside alignment for 0.5 mile along South Broadway between Chippewa Street and I-55 and connects to the alignment at the Civic Center Station, the proposed station at Jefferson Avenue and Chippewa Street, and is within a block of the proposed station at I-55 and Osceola Street.

Under the build alternative, the route would deviate approximately 1 mile along Loughborough Avenue to connect to the proposed station at Loughborough Avenue and I-55. Route 20 would retain its 40 minute peak and midday frequencies.

Route 21 (Watson Road) – Operates between STLCC Meramec and the Shrewsbury-Lansdowne I-44 Station along Big Bend Road, Lindbergh Boulevard, Watson Road, and River Des Peres Boulevard. The route, as currently configured does not connect to the study area.

The build alternative bus recommendations include a route that combines portions of Route 11 and Route 21. The new route would follow existing Route 21 from STLCC Meramec to the Shrewsbury-Lansdowne I-44 Station. From there it would continue east on Lansdowne Avenue, east on Chippewa Street, and terminate at the proposed station at South Jefferson Avenue and Chippewa Street. This route would maintain the 20 minute peak/40 minute midday frequencies currently provided on Route 21. An overlay with Route 8 would be used to achieve more frequent service along the portion of Chippewa Street between Morganford Road and Jefferson Avenue.

Route 30 (Arsenal) – Operates between the Civic Center Station and Shrewsbury-Lansdowne I-44 Station along South 14th Street, Chouteau Avenue, 7th Street/South Broadway, 2nd Street, Utah Street, Arsenal Street, Watson Road, Chippewa Street, and River Des Peres Boulevard. The route connects to the proposed Northside-Southside alignment at the Civic Center Station and Jefferson Avenue at Arsenal Street.

No changes to routing, frequency, or schedule are recommended under the build alternative. A small loop at 2nd Street and Utah Street serving the existing NGA facility may not be needed after the relocation of the NGA to North St. Louis. Changes to this small segment (outside the scope of the Northside-Southside Study) would not significantly affect assumed running times.

Route 31 (Chouteau) – Operates between the Civic Center Station, the Maplewood-Manchester Station, and Breckenridge Industrial Court along 14th Street, Chouteau Avenue/Manchester Road, Mercantile Drive, Brentwood Industrial Drive, and Breckenridge Industrial Court. The existing route overlays the proposed Northside-Southside alignment for 1.2 miles along South 14th Street and Chouteau Avenue.

No changes to routing, frequency, or schedule are recommended under the build alternative.

Route 32 (M.L. King) – Operates between the Rock Road Station and the Civic Center Station along St. Charles Street, Rock Road, Dr. Martin Luther King Jr. Drive, Cass Avenue, 9th Street/10th Street, Washington Avenue, Tucker Boulevard, Market Street, and 14th Street. The existing route connects to the proposed Northside-Southside alignment at 9th/10th Streets at Lucas Avenue and at the Civic Center Station. In addition, the route crosses NGA Option 2 at Jefferson Avenue at Cass Avenue and the LPA and NGA Option 1 at North 14th Street at Cass Avenue. The walk distance from Cass Avenue to Biddle Street Station is less than a quarter-mile and this connection would be captured in a ridership model without a reroute. As configured, Route 32 provides direct service between the planned NGA facility to downtown rail and transfer connections.

No changes to routing, frequency, or schedule are recommended under the build alternative.

Route 40X (I-55 Express) – Operates between downtown, the Civic Center Station, and the STLCC South County Education Center along South Broadway, Market Street, Tucker Boulevard, Spruce Street, 14th Street, Chouteau Avenue, Truman Parkway, I-55, Lemay Ferry Road, and Meramec Bottom Road. The existing route connects to the proposed Northside-Southside alignment at Civic Center Station and at I-55 at Loughborough Avenue. The route parallels the proposed alignment for approximately 3.75 miles along I-55. However, due to the limited stops available for the express route, Loughborough Avenue is the only transfer location between routes.

No changes to routing, frequency, or schedule are recommended under the full build alternative; however, stop locations and timings may be reevaluated under the MOS scenarios.

Route 41 (Lee) – Operates between the Riverview Transit Center and the Civic Center Station along Riverview Boulevard, Thekla Avenue, Emerson Avenue, Lillian Avenue, Kingshighway Boulevard, Lee Avenue, Kossuth Avenue, 25th Street, St. Louis Avenue, 20th Street, Carr Street, 18th Street, Cole Street, and 14th Street. The existing route crosses the proposed LPA alignment at Natural Bridge Avenue /Palm Street at 25th Street. It overlays NGA Option 1 for 0.4 mile on St. Louis Avenue between 25th Street and 10th Street and it overlays NGA Option 2 for 0.2 mile on North 14th Street from Cole Street to Delmar Boulevard.

As part of the build alternative, this route would alter its approach into downtown. From the Lee Avenue/Grand Boulevard intersection, the route would turn south to make a connection to the proposed station at Natural Bridge Avenue and Grand Boulevard. From there it would mimic the 2008 LPA along Natural Bridge Avenue, Palm Street, Florissant Avenue, and North 14th Street to the Civic Center Station. This route would operate every 30 minutes during peak service and every 40 minutes during the midday.

Route 42 (Sarah) – Operates between the Broadway-Taylor Transit Center and Central West End Station along North Broadway, College Avenue, West Florissant Avenue, Fair Avenue, Sarah Street, Whittier Street, North Sarah Street, Vandeventer Avenue, Forest Park Avenue, and Taylor Avenue. The existing route connects to the proposed Northside-Southside alignment at Natural Bridge Avenue and Fair Avenue.

No changes to routing, frequency, or schedule are recommended under the build alternative.

Route 70 (Grand) – Operates between the Broadway-Taylor Transit Center and Loughborough Commons along North Broadway, North Grand Boulevard, South Grand Boulevard, Grand Drive, and Loughborough Avenue. The existing route connects to the proposed Northside-Southside alignment at Natural Bridge Avenue and North Grand Boulevard.

Under the build alternative, the south end of the route would deviate 0.3 mile on Loughborough Avenue to connect to the proposed station at Loughborough Avenue and I-55. Route 70 would retain its 12 minute peak and midday frequencies.

Route 73 (Carondelet) – Operates between the Civic Center Station and South County Mall along South 14th Street, Chouteau Avenue, Truman Parkway, I-55, Lemp Avenue, Cherokee Street, Grand Boulevard, Meramec Street, South Broadway, Osceola Street, Virginia Avenue, Michigan Avenue, Alabama Avenue, and Lemay Ferry Road. The existing route overlays the proposed Northside-Southside alignment for 0.7 mile along South 14th Street and Chouteau Avenue and crosses the alignment at Jefferson Avenue at Cherokee Street, South Broadway at Meramec Street/Osceola Street, and I-55 at Michigan Avenue (near Bates Street).

Under the build alternative, this route would follow the existing pattern from the south, deviating approximately 0.5 mile on Loughborough Avenue to connect to the station at I-55. The route would terminate at the proposed Jefferson Avenue and Cherokee Station, with trips to downtown accommodated through rail transfer. Route 73 would retain its 30 minute peak and midday frequencies.

Route 74 (Florissant) – Operates between the North County Transit Center and the Civic Center Station along Pershall Road, Florissant Avenue, and 14th Street. The route overlays the proposed LPA alignment for 1.7 miles along Florissant and North 14th Street, and NGA Option 1 for 1.2 miles. The route crosses NGA Option 2 at North 14th Street at Delmar Boulevard.

As part of the build alternative, Route 74 would follow its existing pattern from the north along Florissant Avenue to Salisbury Street. It would then turn west on Salisbury Street connecting to the proposed station at Natural Bridge Avenue and Parnell Street. From there it would approach downtown by traveling south on Parnell Street/Jefferson Avenue, east on Cass Avenue, and south on 14th Street. This configuration would provide connections to the Parnell Street/St. Louis Avenue NGA Option 1 Station, the Cass Avenue/Jefferson Avenue NGA Option 2 Station, and the Biddle Street Station on the LPA and NGA Option 1 Alternatives. This allows key population and employment centers (such as the NGA facility and Preservation Square Housing Complex) to maintain a connection to a proposed Northside-Southside station regardless of which alternative is pursued. This route would retain its 24 minute peak and 30 minute midday frequency.

Route 80 (Park-Shaw) – Operates between the Central West End Station and the Civic Center Station along Taylor Avenue, Chouteau Avenue, Tower Grove Avenue, Magnolia Avenue, Thurman Avenue, Shenandoah Avenue, 39th Street, Park Avenue, Truman Parkway, and South 14th Street. The route overlays the proposed Northside-Southside alignment for 0.7 mile on South 14th Street and Chouteau Avenue and connects to the alignment at Civic Center Station, Chouteau Avenue and Grattan Street, and Jefferson Avenue at Park.

No changes to routing, frequency, or schedule are recommended under the build alternative.

Route 90 (Hampton) – Operates between the Riverview Transit Center and the Catalan Loop Transit Center along Hall Ferry Road, McLaran Avenue, Goodfellow Boulevard, DeBaliviere Avenue, Hampton Avenue, and Germania Street. The route crosses the proposed Northside-Southside alignment at Goodfellow Boulevard and I-70, Goodfellow Boulevard and Natural Bridge Avenue, and at I-55 and Germania Street.

No changes to routing, frequency, or schedule are recommended under the build alternative.

Route 94 (Page) – Operates between Westport Plaza, Wellston Station, and the Civic Center Station along Westport Plaza Drive, Fee Fee Road, Adie Road, Ball Drive, Lackland Road, Schuetz Road, Lindbergh Boulevard, Page Avenue, Dr. Martin Luther King Jr. Drive, 18th Street, Market Street, and 14th Street. The route crosses NGA Option 2 at Delmar Boulevard at 18th Street. The south end of the route connects to the Civic Center Station.

No changes to frequency or schedule are recommended under the build alternative

Route 95 (Kingshighway) – Operates between Broadway-Taylor Transit Center and Hampton-Gravois Transit Center along Taylor Avenue, Florissant Avenue, Kingshighway Boulevard, and Gravois Avenue. The existing route connects to the proposed Northside-Southside alignment at Kingshighway and Natural Bridge Avenue.

No changes to routing, frequency, or schedule are recommended under the build alternative.

Route 97 (Delmar) – Operates between the Clayton Station and the Civic Center Station along South Central Avenue, Ladue Road, McKnight Road, Delmar Boulevard, Enright Avenue, Compton Avenue, Washington Avenue, and 14th Street. The existing route provides a direct connection to the proposed Northside-Southside alignment at the Civic Center Station. The proposed station at Delmar Boulevard and 14th Street and the NGA Option 2 station at Delmar Boulevard and Jefferson Avenue are approximately two blocks from Route 97, allowing this connection to be captured in the ridership model without a reroute.

No changes to routing, frequency, or schedule are recommended under the build alternative.

Route 99 (Downtown Trolley) – Operates between the City Museum, Convention Center Station, and Civic Center Station along Delmar Boulevard, 16th Street, Washington Avenue, Broadway/4th Street, Market Street, Tucker Boulevard, and Spruce Street. The route connects the proposed Northside-Southside alignment at North 14th Street at Delmar Boulevard and at the Civic Center Station.

No changes to routing, frequency, or schedule are recommended under the build alternative.

7.0 Phase 1, Detailed Evaluation

During the second part of Phase 1, the detailed alternatives described in this report will be subject to evaluation against the criteria and sub-criteria listed in Table 2-1. These criteria are linked back to the project goals and objectives, as described in the Purpose and Need Report.

A series of methodology memos will be written to explain the process by which certain elements of the alternatives under consideration will be developed (ridership, capital costs, operating and maintenance costs). A series of technical memos will be written to describe the performance of each alternative against the criteria shown in Table 2-1.

A summary of these analyses will be compiled into the Detailed Evaluation of Alternatives report, which will be drafted in the next phase of the project. The methodology and technical memos will be included as appendices to the report. The outcome of the detailed evaluation of alternatives phase will be one or more alternatives for refinement in support of the identification of an LPA.

NORTHSIDE-SOUTHSIDE STUDY

EAST-WEST GATEWAY
Council of Governments

APPENDIX A

Maintenance Facility Site Analysis

To: Jerry Blair, Marcie Meystrik

From: Kristen Lueken, Gavin Poindexter, Dan Meyers

Date: August 14, 2017

RE: Northside-Southside Conceptual Design Study
Contract Project Number: 17218100-NSSS-062918
AECOM Project Number: 60531190

1. Project Background

The Northside-Southside Project is proposed as an in-street running light rail on embedded tracks with no direct connection to the existing MetroLink system. As a result, vehicles used for the Northside-Southside Project would not share tracks or facilities with the existing MetroLink system, and would require a new maintenance facility along the proposed alignment. The 2008 Northside-Southside Study was a high-level planning analysis and did not identify a maintenance facility. For this phase of the study, identification of viable maintenance sites is critical to understanding potential alignment challenges and developing feasible minimal operable segments (MOS).

2. Initial Site Screening Criteria

An initial round of screening used available parcel data and geographic information system environmental resources to identify areas that met certain objective criteria considered to be prerequisites for a viable maintenance site. These areas will be further refined based on local knowledge of existing and proposed uses, job and housing potential, and discussions with the client and stakeholders. The initial site screening included the following requirements and principles:

- **Must be within the City of St. Louis**: As this is a City-funded project, no St. Louis County parcels were considered in the analysis.
- **Proximity to the alignment**: Maintenance site selection considered only parcels within the project's half-mile Study Area or in an area adjacent to the Study Area and along the riverfront between the McKinley Bridge and the Martin Luther King Bridge.
- **No Section 4(f)/6(f) resources**: Publicly-owned parks and other Section 4(f)/6(f) resources were excluded from consideration.
- **No schools**: Any property containing a private or public school was excluded from consideration.
- **No legally binding affordable housing**: Properties in the National Housing Preservation database containing one or more affordable housing units were excluded from consideration.
- **No bridging**: Sites that were not directly adjacent to the locally preferred alternative (LPA) and National Geospatial-Intelligence Agency West Campus (NGA) alternative alignments were excluded if they were separated from the proposed alignment by a rail or highway facility.

- **Meets dimension requirements**: The ideal maintenance site would accommodate future system expansion and the recommended service. This analysis requires potential sites to be greater than 10 contiguous acres with a minimum width of 225 feet across one or multiple parcels.
- **Preference for underutilized properties**: Underutilized properties are defined as properties with an assessed improvement value less than the assessed land value. Individual parcels with higher ratios were not formally excluded from consideration, but were given a lower weight for purposes of identifying multi-parcel sites.
- **Preference for non-residential**: Preference was given to vacant, industrial, and commercial land uses. Parcels including one or more residential structures were not formally excluded from consideration, but were given a lower weight for purposes of identifying multi-parcel sites.
- **No regional network road closures**: When grouping parcels into larger sites, no grouping that crossed a road identified in the regional network was permitted. Groupings that crossed an access road or alleyway not included in the regional network were allowed.

3. Sites meeting Initial Screening Criteria

Figure 1 highlights in red the underutilized parcels where a property's improvement value is less than the land value[1] excluding those parcels that contain residential structures. Filters for Section 4(f)/6(f) resources, schools, and affordable housing were applied to identify locations where individual parcels or groups of parcels met the above criteria. The 20 sites that resulted from this initial screen are noted by alphabetic map key and summarized below. Several of these sites may not be viable for reasons beyond the initial screening criteria. Factors such as existing and planned land uses, distance from alignment, geometric concerns, and impact on MOSs that preclude a site from further consideration are summarized in Table 1.

[1] Calculated as: assessed land value/total assessed value > 0.5

Figure 1: Sites Meeting First Screen Criteria

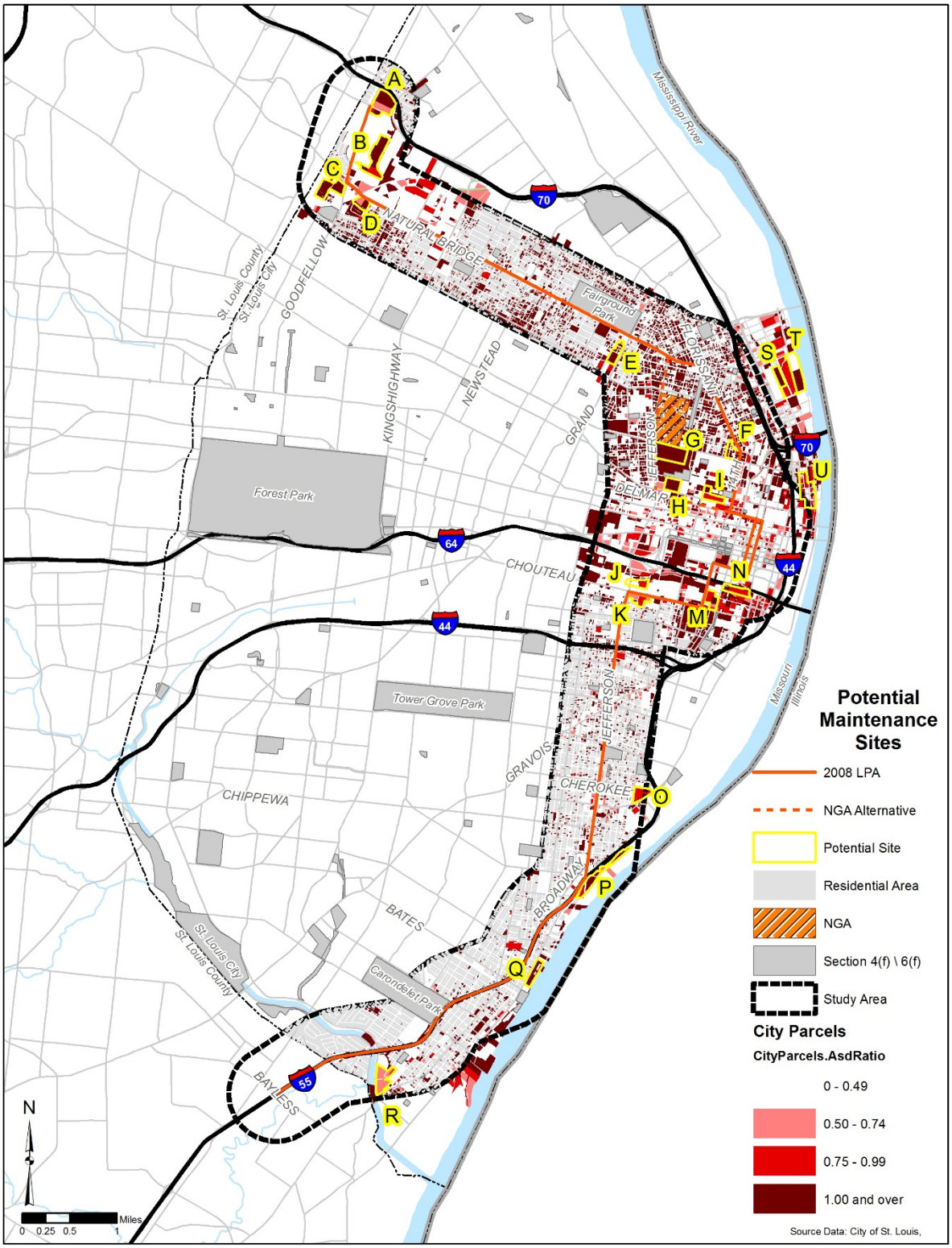


Table 1: Description of Sites Meeting Initial Screening Criteria

Site ID	Total Acres	No. of Parcels	Land Value for all Parcels	Total Value for all Parcels	Ratio	Distance from Alignment	Description	Notes
A	31.3	4	$429,100	$510,500	0.8	Adjacent	Vacant parcel owned by SLDC, vacant building owned by Goodfellow Blvd LLC, church on southeast corner	Requires MOS to Goodfellow Boulevard; P&R potential; the northernmost vacant parcel (excluding the existing buildings) would also meet the first round screening requirements on its own
B	34.7	3	$509,400	$518,100	1.0	500 ft.-1000' ft.	North parcel associated with GSA Complex, some vacancy on southern parcels	Requires MOS on Natural Bridge Avenue; federal property; sufficient acreage is available using a combination of parking lots and open space, but would require access off Goodfellow Boulevard
C	23.8	26	$225,400	$225,400	1.0	Under 500 ft.	Vacant structure, large parking lot, shipping containers	Requires MOS on Natural Bridge Avenue
D	11.1	23	$201,130	$267,430	0.8	Adjacent	Vacant industrial/commercial building, vacant residential lots	Requires MOS on Natural Bridge Avenue; additional vacant lots are available if more acreage is required
E	13.7	34	$144,620	$193,440	0.7	Under 500 ft.	Boys and Girls Club, church, auto shop, and vacant residential	No configuration feasible without impacting existing community facilities
F	12.3	55	$69,510	$118,710	0.6	Adjacent	Vacant land and vacant structures, auto shop	In a Project Connect Neighborhood, would require a neighborhood-compatible or mixed-use design
G	34.6	3	$334,800	$334,800	1.0	Adjacent	Vacant - old Pruitt Igoe site	Plans for future redevelopment; requires LPA on Jefferson Avenue/Parnell Street alignment
H	13.5	1	$2,700	$2,700	1.0	Under 500 ft.	Under-assessed building, Digital Products International/GPX	Existing employment; requires LPA on Jefferson Avenue/Parnell Street alignment
I	13.2	2	$620,600	$668,000	0.9	Under 500 ft.	Under-assessed building, Koken Mfg. and vacant lot	Existing employment; requires LPA or St. Louis Avenue alignment
J	11.0	8	$334,100	$603,500	0.6	Under 500 ft.	Blue Line rental, distribution	Sufficient acreage assumes sufficient clearance under Jefferson Avenue Bridge and site access
K	13.0	8	$559,370	$802,920	0.7	Adjacent	Vanguard Truck Centers, parking lot	Fire station entrance on Jefferson Avenue may require site to be accessed from the north off Chouteau Avenue
M	13.4	7	$1,116,500	$1,252,400	0.9	Adjacent	Ralston Purina parking lots, distribution	Impacts to Purina Distribution building may be avoidable if access is available under Tucker Boulevard Bridge
N	13.5	7	$3,839,600	$4,085,200	0.9	500 ft.-1000 ft.	Parking lots, including Busch Stadium Lot C owned by Metropolitan Park and Recreation and Terminal Railroad Association of St. Louis	Access around structures may require more than 1000 feet of non-revenue track
O	13.7	1	$574,400	$672,000	0.9	2000 ft.-5000 ft.	Lemp Brewery	Historic City Landmark, lengthy non-revenue track
P	24.0	9	$324,520	$370,720	0.9	Under 500 ft.	City/State property, dog pound, workhouse, Drury displays	Requires MOS along I-55; requires change in LPA to locate the primary alignment on east side of freeway
Q	13.9	34	$147,560	$299,240	0.5	500 ft.-1000 ft.	Under-assessed or new development, Mississippi Bluffs	Other data sources indicate existing residential; requires MOS along I-55; requires change in LPA to locate the primary alignment on east side of freeway
R	23.8	6	$508,500	$813,900	0.6	500 ft.-1000 ft.	ICL Performance Products, fewer structures on north half of parcel	Requires MOS to Bayless; sufficient acreage is available using only the vacant land and adjacent parking lot bounded by Germania Street, Primm Street, Alaska Avenue, Courtois Street, the rail spur and Tesson Street
S	10.2	1	$28,300	$28,300	1.0	2000 ft.- 5000 ft.	Transportation-oriented parcel owned by Norfolk & Western RR, St. Louis Produce Market	Operational use for St. Louis Produce Market, access to site may require more than 5000 feet of non-revenue track
T	27.4	2	$13,400	$13,400	1.0	Over 5000 ft.	Transportation-oriented parcel owned by City of St. Louis	Freight Spur, River Front Trail
U	23.5	44	$1,004,600	$1,354,800	0.7	2000 ft.-5000 ft.	Primarily vacant and vacant structures, restaurant, charity, and petroleum supplier	May be possible to avoid impacts to non-vacant uses depending on configuration of the site

As shown on Figure 2, Sites A, B, C, and D are located along the northern end of the alignment and would only be feasible for full build or MOSs that extend along Natural Bridge Avenue and Goodfellow Boulevard. Site A consists of four parcels, the largest of which is a 16.6 acre vacant lot that is owned, in part, by members of the St. Louis Development Corporation (SLDC). Site B contains three parcels: one is federally owned and part of the surrounding General Services Administration complex, one is held by a private limited liability corporation (LLC), and one parcel is held by the City of St. Louis Land Reutilization Authority. Although sufficient acreage exists on the City-owned and vacant parcels, the irregular shape and proximity to federal uses may limit this site's utility. Site C consists of 26 parcels, the majority of which are held by a single private owner. Two large parcels are owned by the City of St. Louis. Site D is comprised of 34 separate properties with a variety of owners; many of the small vacant lots are owned by the Metropolitan Sewer District (MSD), indicating a potential drainage/retention use.

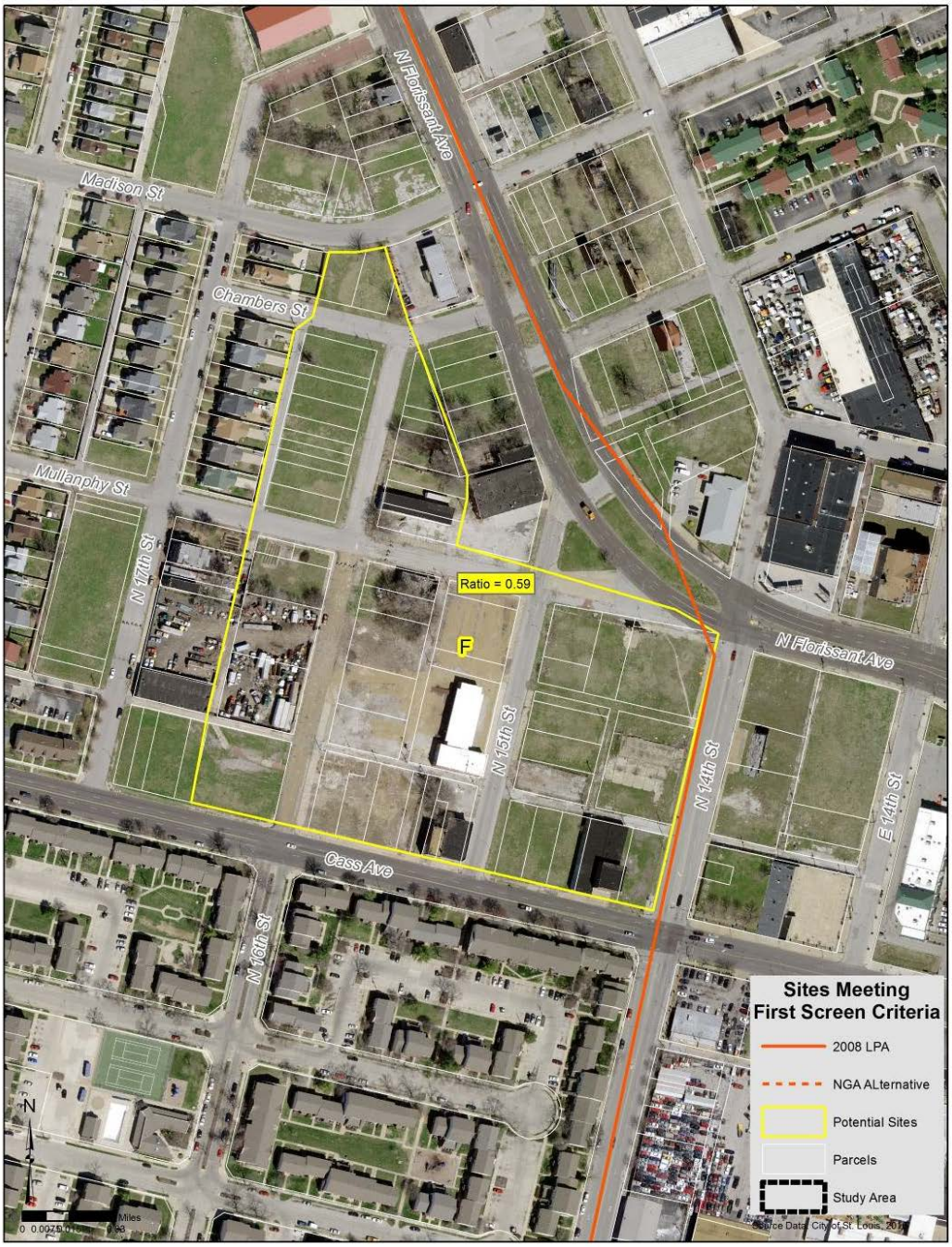
Figure 2: Sites A, B, C, and D off Goodfellow Boulevard

Site E, shown on Figure 3, is not recommended for further study, as this area includes property associated with a Boys and Girls Club and is a mix of 34 vacant and residential properties. It is also located in one of the Project Connect neighborhoods, where the City has committed to avoiding additional residential displacements.

Figure 3: Site E off Natural Bridge Avenue

Site F, shown on Figure 4, is also located within the Project Connect Study Area, but may avoid residential impacts (based on available assessor's data). This site includes 55 individual properties, the majority of which are vacant property or vacant structures. More than half of these parcels are owned by Northside Regeneration LLC, and many other smaller parcels are consolidated among a few individual owners. This potential maintenance facility site would not be viable for the alignment alternative on Jefferson Avenue. The city would prefer that this site be targeted for more neighborhood-compatible development. A maintenance facility here would require a multi-use or innovative design.

Figure 4: Site F off Florissant Avenue and 14th Street



Site G (Figure 5) is the former Pruitt Igoe site and has been identified for major redevelopment. Although the existing conditions on the three associated parcels meet all first tier maintenance facility criteria, the redevelopment potential of the site, located directly south of the planned NGA facility, may preclude it from further analysis.

Site H (Figure 5) and Site I (Figure 6) both contain large structures that appear to have higher value than the assessed improvements. Both sites have active employment and are not recommended for further study.

Figure 5: Sites G and H off North Jefferson Avenue

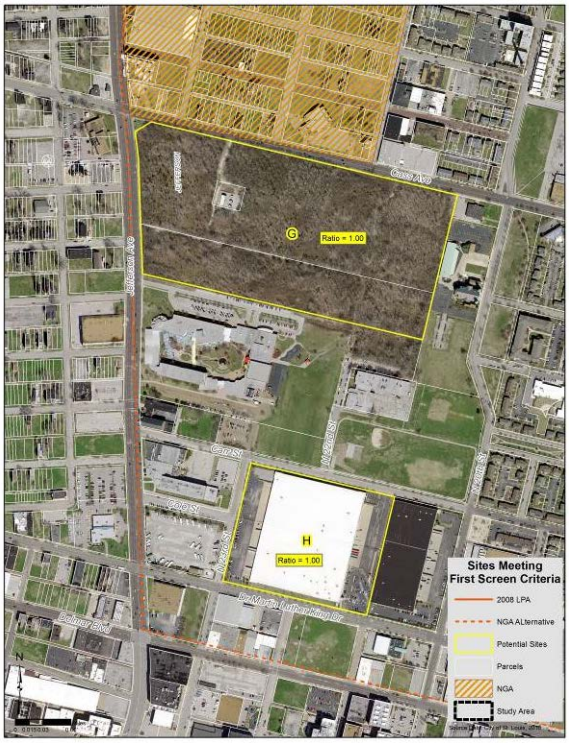


Figure 6: Site I off Delmar Boulevard and North 14th Street

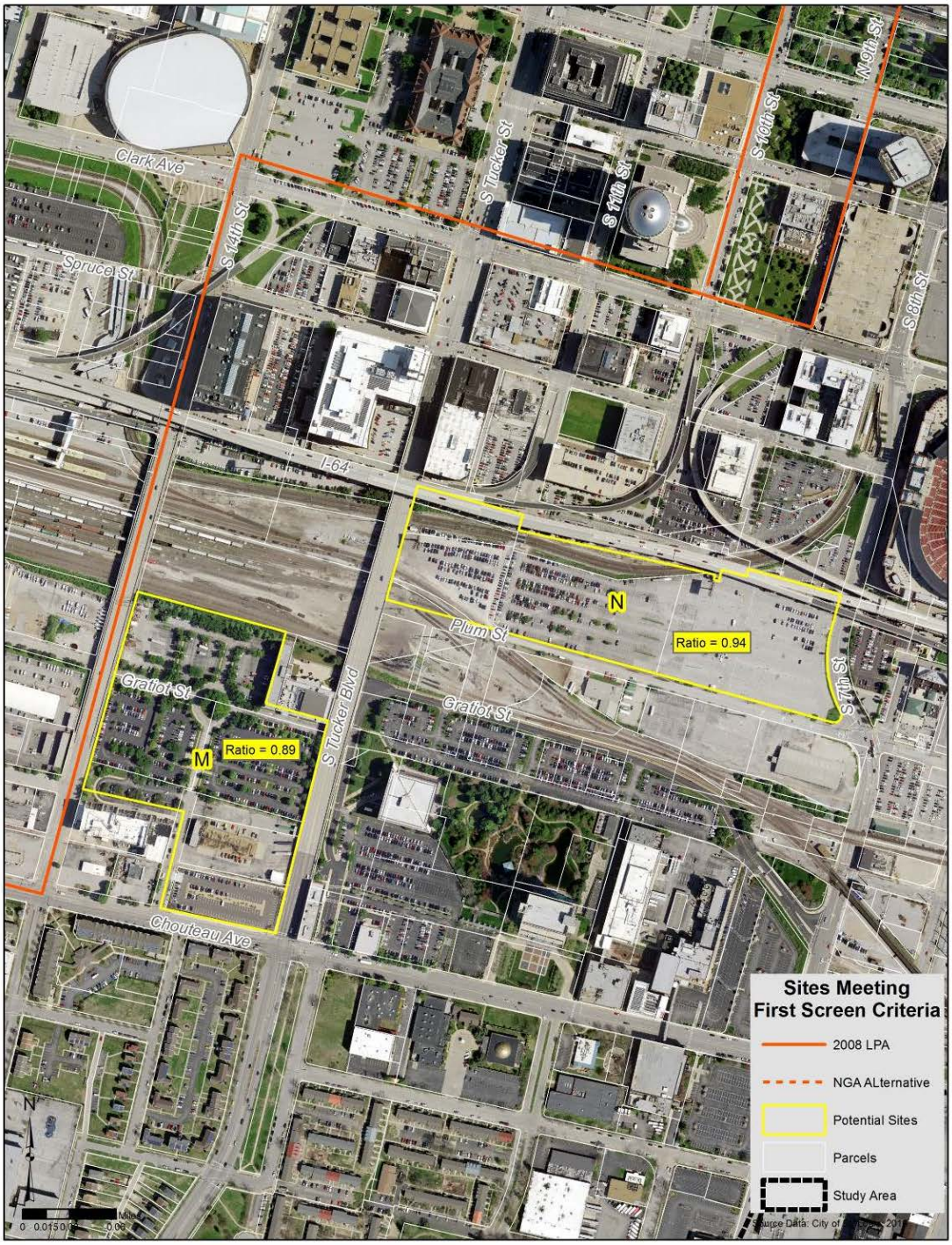
Sites J and K are shown on Figure 7. Site J includes Blue Line Rental and a distribution center and achieves sufficient acreage by utilizing the space underneath the Jefferson Avenue Bridge. The feasibility of this site will depend on engineering constraints, such as the clearance under Jefferson Avenue and ability to access the site given changes in roadway geometry. Site K contains a trucking facility and vacant/parking lots. Central to the site is a large parcel owned by PraxAire Distribution, which has been targeted for residential redevelopment.

Figure 7: Sites J and K off South Jefferson Avenue and Chouteau Avenue

Site M (Figure 8) includes three parcels with a parking lot owned by Ralston Purina and an additional four parcels associated with the C.F. Blanke Building. The configuration of this site would avoid directly impacting the building, which includes residential condos and office locations for the St. Vincent DePaul Society and Kipp Schools, but would surround the building on multiple sides. 2016 street view photography indicates new construction activity in the southeast quadrant of the site. Site N (Figure 8) is surface parking for Busch Stadium. The site includes seven parcels, with the majority of acreage owned

by the Metropolitan Park and Recreation, doing business as Great Rivers Greenway (GRG), and other land owned by the Terminal Railroad Association of St. Louis. GRG has developed some trail and water feature plans for this site. The feasibility of using this site for a maintenance facility is contingent on GRG's planning decisions going into Final Design. Feasibility for this site would also depend on Northside-Southside engineering design and access to the site given existing roadway geometries.

Figure 8: Sites M and N off South 14th Street



Site O (Figure 9) is the Lemp Brewery Historic Site and would require seven blocks of non-revenue service to access. Site P (Figure 9) contains a mix of public land uses and would require a bridge across I-55 at a point significantly north of the recommended structure for the 2008 LPA alignment. Neither site is recommended for further analysis.

Figure 9: Sites O and P off South Jefferson Avenue

Site Q (Figure 10) would require an MOS that includes the I-55 portion of the alignment and revised engineering to bridge I-55 at a more northern location than indicated in the 2008 LPA. In addition the site requires field verification of existing land uses, which aerial photography indicates may be residential. For these reasons it is not recommended for further analysis.

Figure 10: Site Q off I-55

Site R (Figure 11) is located at the southern end of the I-55 corridor and would only be feasible for the full build or MOS alternatives focused on the southernmost portions of the alignment. Site R includes a large parcel owned by ICL Performance Products, and would likely require segmentation to minimize impacts to existing employment.

Figure 11: Site R off I-55

Figure 12 illustrates Sites S, T, and U, located east of the Study Area along the riverfront just north of downtown. All sites are located within a FEMA zone for reduced flood risk due to levee. Site S is a single large parcel owned by Norfolk and Western Railroad, and St. Louis Produce Market (Produce Row). The site is used for rail and truck freight loading for the adjacent Produce Row facilities (a $100M business employing 1,200).[2] The site is 0.7 mile from alignment options on Florissant Avenue; however, due to street configuration and limited I-70 crossing locations, 1 mile of non-revenue track would be needed to access the site.

Site T consists of two parcels owned by the city of St. Louis, both of which are large enough individually to accommodate the maintenance facility. Current usage on both parcels includes freight rail spurs and the River Front Trail. The River Front Trail is part of the regional bike and trail network. Approximately 1 mile of non-revenue track would be required from Florissant Avenue.

Site U includes of 44 individual parcels comprising over 23 acres. The majority of the area consists of parking lot and vacant land uses. A few small parcels within the site include productive land uses, such as a steakhouse, petroleum supplier, and offices for a charitable foundation. It is possible that a 10 acre maintenance facility could be configured within the 23 acre site to avoid impacts to higher productivity uses on smaller parcels. The site is 0.5 mile from the alignment area and would require 0.7 mile of non-revenue tracks.

[2] St. Louis Produce Market, http://www.stlouisproducemarket.com/produce-row-history.html, accessed July 2017.

Figure 12: Sites S, T, and U along Riverfront

4. Detailed Site Evaluation

In collaboration with East-West Gateway Council of Governments and the City of St. Louis, five potential sites (A, F, J, M, and N) are recommended for further analysis and refinement through the National Environmental Policy Act (NEPA) process (Table 2). Two of these sites, F and N, are more dependent on other plans and projects still under development and may require specific site design features to accommodate those plans. Site A is contingent on a first phase extending north to Goodfellow Boulevard and may require coordination with the proposed MetroNorth light rail study.

Table 2: Sites Recommended for NEPA Refinement

Site ID	Total Acres	# of Parcels	Land Value for all Parcels	Total Value for all Parcels	Ratio	Distance from Alignment	Description	Notes
A	31.3	4	$429,100	$510,500	0.8	Adjacent	Vacant parcel owned by SLDC, vacant building owned by Goodfellow Blvd LLC, church on southeast corner	Requires MOS to Goodfellow Boulevard; P&R potential; the northernmost vacant parcel (excluding the existing buildings) would also meet the first round screening requirements on its own
F	12.3	55	$69,510	$118,710	0.6	Adjacent	Vacant land and vacant structures, auto shop	In a Project Connect Neighborhood, would require a neighborhood-compatible or mixed-use design
J	11.0	8	$334,100	$603,500	0.6	Under 500'	Blue Line Rental, distribution	Sufficient acreage assumes sufficient clearance under Jefferson Avenue Bridge and site access
M	13.4	7	$1,116,500	$1,252,400	0.9	Adjacent	Ralston Purina parking lots, distribution	Impacts to Purina Distribution building may be avoidable if access is available under Tucker Street Bridge
N	13.5	7	$3,839,600	$4,085,200	0.9	500'-1000'	Parking lots, including Busch Stadium Lot C owned by Metropolitan Park and Recreation and Terminal Railroad Association of St. Louis	Contingent on GRG planned use, access around structures may require more than 1000 feet of non-revenue track