Document Revision Record

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AECOM Project Number: 60531190

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Date: September 2018

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Date:

Project Manager:

Principal:

Client Project Manager:
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1.0 Project Overview

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.

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 Purpose of the Document

The purpose of this document is to compile key planning decisions that are not captured in other project documentation, including the Detailed Definition of Alternatives Report (October 2017) and Detailed Evaluation of Alternatives Report (May 2018), which are each available under separate cover. This document covers four issues, which will require ongoing coordination as the Northside-Southside light rail transit (LRT) project moves forward into future project phases:

- Coordination with Citygarden
- Coordination with America’s Center
- Consideration of a southern alignment along Broadway
- Confirmation of an alignment through the NGA/Old North St. Louis area

3.0 Coordination with Citygarden

EWGCOG staff and City of St. Louis staff attended two meetings (one in March 2018 and one in May 2018) with representatives of the Gateway Foundation, which designed, built, and manages Citygarden in downtown St. Louis. Citygarden occupies two city blocks bound by Chestnut Street, Market Street, 10th Street, and 8th Street. The Northside-Southside LRT is designed to operate northbound along 9th Street through Citygarden.

At the March 2018 meeting, a series of issues, including maintaining the safety and integrity of the park design (including sight lines) and potential design solutions for LRT operations on 9th and/or 10th streets were discussed. Gateway Foundation representatives provided the consulting team with the following questions/issues, which were answered/addressed in an April 2018 memorandum.

- Is the use of 10th/Chestnut a viable option (including the turn back to 9th)?
- How much park ROW would be required for the 10th/Chestnut alignment?
- Light rail speed?
- Can a station simply be a raised platform?
- Height of boarding platform?
- What is the minimal width of the platform?
- Would a possible station be located to the north or south, to the east, west, or center?
- Could fare machines be located at the entries to the park instead of on the platforms?
- How long does a train stop at a station?
- What are the material options for the space between the tracks?
- What materials could be used to fill the wheel flange space?
- How long would construction take on 9th Street within the park?

The Gateway Foundation expressed its potential willingness to cooperate with and support the City of St. Louis on Northside-Southside LRT implementation through Citygarden in return for the following agreements.

- Permanent closure of 9th Street to all vehicular traffic, with the exception of northbound rail traffic.
- The City of St. Louis to expressly turn over management of this space—by formally vacating 9th Street—to the Gateway Foundation to be operated under the terms of the existing Cooperation Agreement.
Agreement between the City of St. Louis and the Gateway Foundation. The Foundation would like to begin this take-over process in 2018.

- The authority to design and build—with the exception of the physical laying of track as needed for the rail traffic—all elements of infrastructure needed for the operation of the line. This would include any park design elements that are viewed by the Foundation as needed to integrate the line into Citygarden.
- The authority to design and build a station on the northern end of 9th Street south of Chestnut Street, with the exception of the physical required station elements and track as needed for the train station.
- The City, or other entity, to reimburse the Gateway Foundation for expenses that would have been incurred by the City in the design and/or construction of all aspects of the rail system running along 9th Street between Market and Chestnut streets had the Foundation not taken on these projects. This includes, but is not limited to, the cost of barriers, station, ticket stand, etc.

Illustrative design drawings provided by the Gateway Foundation are included in Appendix A. Coordination with the Gateway Foundation will continue as the project moves into Project Development and the environmental clearance process.

4.0 Coordination with America’s Center

Background

Since the 2008 Northside-Southside Study, America’s Center has begun conversations with the City of St. Louis to vacate 9th Street between Lucas Avenue and Convention Plaza to allow for America’s Center to expand to the west. In addition, America’s Center is planning an expansion that includes adding a plaza on the block bounded by Convention Plaza on the north, 9th Street on the east, Lucas Avenue on the south, and 10th Street on the west.

The 2008 LPA had tracks on Convention Plaza and a one-way pair on 9th and 10th streets. As a result, the 2008 LPA would pass between the planned plaza and America’s Center on the vacated portion of 9th Street. The project team has explored four additional alignment alternatives that provide options for addressing the rail’s interface with America’s Center.

Potential Options

The following provides a high-level overview of each of the proposed options. Appendix B provides more detail regarding the conceptual designs.

Current Design

The current design would traverse through the proposed expansion plans for America’s Center on what is currently 9th Street, between the planned plaza and the existing convention center. The LRT would need to be integrated with the planned expansion of America’s Center. Positioning the stations between Washington Avenue and Lucas Avenue would provide easy connections to America’s Center and businesses along Washington Avenue. Figure 4-1 shows the current design through downtown St. Louis near America’s Center.
Figure 4-1: Current Design through Downtown St. Louis near America’s Center

There is loading dock for America’s Center on 9th Street near the intersection with Lucas Avenue. America’s Center staff are concerned about maintaining large vehicle access to the loading dock with an LRT station on 9th Street south of Lucas Avenue. Figure 4-2 and Figure 4-3 show the turning movements for a truck with a 67-foot wheel base, the largest truck currently using the loading dock. While the truck turning into the loading dock would be required to cross the LRT tracks within the intersection of 9th Street and Lucas Avenue, they could continue to access the loading dock. General automobile traffic and trucks accessing the loading dock would be allowed to cross the tracks at the intersection of 9th Street and Lucas Avenue. These movements would, however, require signalization of the intersection to separate LRT vehicles from general traffic and trucks.
Figure 4-2: Turning Movements into the America’s Center Loading Dock on 9th Street
Recommendation: Continue to explore integrating with the proposed America’s Center plaza with representatives from Explore St. Louis, in an effort to develop a workable solution for both projects.

Option 1: Cut Through Proposed Plaza

Option 1 is to maintain single track operation on 9th and 10th streets, as proposed in the 2008 LPA. Then the northbound track in Option 1 would cut diagonally across the proposed America’s Center plaza between the intersections of 9th Street and Lucas Avenue to 10th Street and Convention Plaza. This option would allow for the planned vacation of 9th Street between Lucas Avenue and Convention Plaza. Option 1 would allow the LRT alignment to be integrated into the design of the proposed convention center plaza. In addition, it may require shifting the northbound platform for the Washington Avenue station slightly. During further design, the location of the northbound station should be explored in greater detail, including potentially modifying the standard station platform dimensions to avoid conflicts with existing driveways. Option 1 would require coordination between the America’s Center expansion and the Northside-Southside Project. Figure 4-4 shows Option 1 with the northbound alignment cutting diagonally through the blocked planned for a plaza.
Figure 4-4: Option 1: Cut Through Proposed Plaza

**Recommendation:** Continue to explore integrating with the proposed America’s Center plaza with representatives from Explore St. Louis, in an effort to develop a workable solution for both projects.

**Option 2: Cut Through Western Parking Lot**

Option 2 maintains single track operation on 9th and 10th streets, as proposed in the 2008 LPA. When the northbound track reaches Lucas Avenue it turns west traveling along the south side of the proposed convention center plaza until 10th Street. Both northbound and southbound tracks would cross the western parking lot diagonally with a station in the middle of the block. This option would allow for the expansion of the America’s Center to continue as planned. Option 2 would allow for the light rail station to be integrated with landscaping of the western parking lot, acting as extension of the convention center.
plaza and providing sight line connections between the station and the America’s Center, encouraging America’s Center visitors to access and use the MetroLink system. Figure 4-5 shows Option 2 cutting through the block to the west of the proposed plaza and integrating a station into the block. Figure 4-6 shows the rail integrated into a plaza at Portland State University.

Figure 4-5: Option 2: Cut Through Block to the West of Proposed Plaza
In order for light rail vehicles to make the turn from 9th Street to Lucas Avenue, the light rail tracks would need to be located either on the eastern side of 9th Street, closest to the loading dock for the America’s Center, or encroach slightly on the planned America’s Center plaza.

**Recommendation**: Continue to explore crossing the proposed America’s Center plaza with representatives from the America’s Center, in an effort to develop a workable solution for both projects.

**Option 3: Both Tracks on 10th Street**

Option 3 has both northbound and southbound tracks on 10th Street from Convention Plaza to Clark Avenue. This would avoid conflicts with planned expansion of the America’s Center. However, two-way operations would require closing 10th Street to through traffic, which would have a significant impact on downtown circulation. There are numerous businesses including structured parking and loading docks with access from 10th Street. A single travel lane providing access to businesses and residences along 10th Street could likely be maintained, except at station locations. It would also require the light rail tracks to shift back and forth from the east to the west side of the right-of-way to in order to maintain driveway accesses. These minor shifts in the track alignment will reduce the speed that light rail vehicles can travel between stations. In addition, the reduction of 10th Street to a single travel lane may limit the types of vehicles that can access the businesses along 10th Street, due to reduced turning radius. Single lane access to businesses would require indirect routing to and from business and may detract from business.
Since the platforms would be approximately 6 inches higher than the sidewalk, separation between the sidewalk and platform would likely be required in the form of a railing, step, or combination of railing and step at various points along the platform. This would require narrowing the existing sidewalk. In places where building doors open out, sidewalk capacity may be limited. Figure 4-7 shows Option 3 with both northbound and southbound tracks on 10th Street.

**Figure 4-7: Option 3: Both Tracks on 10th Street**

**Recommendation**: Remove the concept of double tracking 10th Street from consideration.
Option 4: Washington Avenue

Option 4 would avoid the planned expansion of the America's Center by turning the LRT alignment from 9th and 10th streets on Washington Avenue (one block south of Lucas Avenue), and follow Washington Avenue to 14th Street. To accommodate the light rail turning movements from Washington Avenue onto 10th Street would require converting Washington Avenue into a one lane road (most likely westbound) from 10th Street to 14th Street. While no lane closures would be necessary to allow light rail vehicles to turn from Washington Avenue onto 14th Street, the stop bar for westbound traffic on Washington Avenue would need to be moved farther from the intersection, which would limit visibility for a driver turning onto 14th Street.

Another challenge that would be introduced by converting Washington Avenue from a two-way street to a one-way westbound street would be redirecting the eastbound traffic currently on Washington Avenue. St. Charles Street, the next street to the south, would generally be a logical pair in a one-way pair; however, St. Charles Street primarily functions as an alley to the businesses on Washington Avenue with numerous loading docks and dumpsters protruding into the sidewalk and, in some cases, the street. Adding large amounts of traffic to St. Charles Street may have an adverse impact on the businesses that rely on St. Charles Street for deliveries and picks-ups. Figure 4-8 shows Option 4 with eastbound and westbound tracks on Washington Avenue.

Additionally, Washington Avenue is used for special events. The special events may need to be rerouted to other streets if light rail is operating on Washington Avenue.
**Recommendation**: Remove the Washington Avenue option from consideration.

**Option 5: 9th Street – Washington Avenue – 10th Street**

Option 5 maintains single track operation on 9th and 10th streets as proposed in the 2008 LPA. When the northbound track reaches Washington Avenue it turns west traveling along the north side of Washington Avenue then turns north at 10th Street. Both northbound and southbound tracks would stay on 10th Street before turning west on Convention Plaza as shown on Figure 4-9. This would require converting Washington Avenue from five lanes to three lanes between 9th and 10th streets. Due to track turning radius and tangent length requirements at platforms, the station would need to be located in the current intersection of 10th Street and Lucas Avenue, necessitating the closure of Lucas Avenue at 10th Street, essentially forming two dead-end roads. In addition, 10th Street between Convention Plaza and Washington Avenue would need to be closed to vehicular traffic other than light rail vehicles. This option would have a significant impact on downtown circulation.
To accommodate the track turning radius, right-of-way acquisition would be required at the northeast corner of Washington Avenue/10th Street and southwest corner of Convention Plaza/10th Street. Other concerns include poor sight line for the LRT and pedestrians at the southwest corner of 9th Street and Washington Avenue, and introduction of two-stage pedestrian crossing at the northeast corner of 10th Street and Washington Avenue due to track turning radius.

**Figure 4-9: Option 5: Tracks on 9th Street – Washington Avenue – 10th Street**

**Recommendation**: Remove the 9th Street – Washington Avenue – 10th Street option from consideration.

**Option 6: 9th Street – Washington Avenue – 10th Street with Western Parking Lot**

Option 6 maintains single track operations on 9th and 10th streets as proposed in the 2008 LPA. When the northbound track reaches Washington Avenue, it turns west traveling along the north side of Washington Avenue, then turns north at 10th Street. Similar to Option 5, this would require converting Washington Avenue from five lanes to three lanes between 9th and 10th streets. Both northbound and
southbound tracks would cross the western parking lot diagonally with a station in the middle of the block. However, because the station would be shifted out of 10th Street, a single lane of traffic on 10th Street can be maintained between Washington Avenue and Lucas Avenue (Figure 4-10). It would also allow Lucas Avenue to remain open to vehicular traffic at 10th Street.

To accommodate the track turning radius, right-of-way acquisition would be required at the northeast corner of Washington Avenue/10th Street. The western parking lot would need to be acquired to accommodate the tracks and platform.

Other concerns with this option include poor sight line for the LRT and pedestrians at the southwest corner of 9th Street and Washington Avenue and introduction of a two-stage pedestrian crossing at the northeast corner of 10th Street and Washington Avenue due to track turning radius.

**Recommendation:** Remove the 9th Street – Washington Avenue – 10th Street with western parking lot option from consideration.
Conclusion

Based on the review of possible options to accommodate the planned expansion of the America’s Center, the Northside-Southside corridor should remain as close as feasible to the LPA approved in 2008. Any deviations, if necessary, to the 2008 LPA should be confined to the portion of the alignment immediately adjacent to the America’s Center, between the intersection of 11th Street and Convention Plaza and Lucas Avenue. As a result, the Northside-Southside Study will only consider the current alignment and Options 1 and 2.
5.0 Alignment Option along Broadway

Introduction

The Northside-Southside Project is proposed as an in-street running light rail on embedded tracks. The current Northside-Southside Study builds upon a similar study completed in 2008, which identified an LPA that included light rail operating adjacent to I-55 south of Gasconade Street, primarily for faster running times. During study stakeholder engagement, the project team was asked to evaluate an alignment south of Gasconade Street that would operate along Broadway, rather than I-55. A formal request to do so was made in a letter, dated June 17, 2017, from St. Louis Aldermen to the EWCCOG. The memorandum summarizes the initial evaluation of an alignment along Broadway. It is anticipated that the alignment along Broadway would be evaluated further as the project advances (Figure 5-1). The focus of the analysis is on physical feasibility. It does not address potential ridership impacts and development opportunities.

Potential Broadway Alignment

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.
Figure 5-1: 2008 LPA Alignment and Broadway Alignment Option
Development Opportunities along Broadway

The neighborhoods along Broadway are stable neighborhoods that have experienced a neighborhood-based rebirth in the last decade, particularly along the river with the development of the Bluffs on Broadway and Chouteau's Bluff, and along Michigan Avenue near Carondelet Lions Park and Fanetti Plaza. In addition, the construction of River City Casino added a regional destination to the Broadway corridor. The addition of in-street running light rail along Broadway could build upon ongoing redevelopment to transform the Broadway area, as it has in other communities like Norfolk, Virginia, and St. Paul, Minnesota (Figure 5-2).

Figure 5-2: Redevelopment along Street Running Light Rail

Southern Terminus

Further evaluation would be required to identify the southern terminus of the alignment along Broadway. FTA prefers projects to have logical termini, or strong destinations, on either end of line. Since an alignment along Broadway would primarily serve the communities along Broadway, compared to an I-55 alignment that would primarily serve commuters from the southern end of the corridor, the demand for a park-and-ride lot at the southern terminus would likely be reduced. In addition, there is no large commercial node along Broadway that would create a logical terminus. Instead, the development along Broadway is generally neighborhood commercial or industrial and is consistent along the corridor.

Further examination, including public engagement, would likely be needed, possibly in subsequent phases of overall project development, to determine the southern terminus along Broadway. As part of the exploration into a logical southern terminus, connections to the River City Casino should be evaluated. In addition, the identification of a southern terminus should be coordinated with the St. Louis County's forthcoming study evaluating a MetroSouth light rail extension.
Design Challenges

Several areas along Broadway create design challenges and may result in additional impacts to the surrounding community, including the I-55 overpass and interchange with Broadway, Bellerive Boulevard bridge over Broadway, freight tracks south of Tesson Street, and the bridge over the River des Peres. While all of these design challenges have potential solutions, they could have additional impacts on the neighboring community that would need to be weighed against the potential benefits.

I-55 Overpass and Interchange

The current I-55 bridge over Broadway is a four-span bridge with approximately 16 feet of clearance. Broadway has one through lane, one left turn lane, and a bicycle lane under I-55 in each direction (Figure 5-3). Currently the area under the I-55 bridge is insufficient to maintain the existing traffic movements and introduce light rail operations.

As a result, a new bridge for I-55 over Broadway would need to be constructed. The new bridge would likely be a two- or three-span bridge to provide the additional width to accommodate the existing traffic movements and light rail. The new bridge would need to be raised to provide necessary clearance for light rail vehicles. Raising the level of I-55 approximately 4 feet may result in reconfiguring the on and off ramps for the interchange between Broadway and I-55.

Figure 5-3: I-55 over Broadway

Bellerive Boulevard Bridge

The existing Bellerive Boulevard bridge over Broadway is a low clearance arched bridge, with clearance that varies between 13 feet and 15 feet 4 inches over Broadway (Figure 5-4). Operating light rail on Broadway would require the construction of a new Bellerive Boulevard bridge to provide adequate clearance for light rail. This would also require raising the profile of Bellerive Boulevard.
Freight Tracks South of Tesson Street

Broadway is crossed by a freight railroad track south of Tesson Street. If the terminus of the light rail were south of Tesson Street, the light rail would need to be grade separated from the freight track. This would likely require a new bridge for both light rail and automobile traffic on Broadway over the freight tracks. Building a bridge would also raise the level of Broadway. As a result, it would likely require closing the driveways along Broadway between Primm Street and Poepping Street, one block north and south of Tesson Street (Figure 5-5). This loss of access to Broadway would likely result in acquisition of residences and relocation of businesses, which may be enough community impact to result in the selection of a terminus north of Tesson Street.
Bridge over the River des Peres

The bridge over the River des Peres currently has three southbound travel lanes (right turn lane, through lane, and left turn lane) and one northbound travel lane. The bridge, not including sidewalks, is approximately 55 feet wide. As a result, the construction of a new bridge over the River des Peres would be required to maintain the existing traffic patterns and add light rail.

Conclusion

Based on the preliminary review of the Broadway corridor, in-street running light rail appears to be feasible from a design perspective. However, crossing the freight tracks south of Tesson Street would introduce some potentially significant impacts to residents and businesses. Further evaluation is needed to identify a logical terminus and potential station locations.
The outcome of the Northside-Southside Study likely will be a minimal operable segment (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.

Analysis of future phased investment to reach full corridor build-out, which would likely occur in future phases of overall project development, would include ridership and development impact, including potential transit-oriented development opportunities.

### 6.0 Cass Avenue Alternative

The routes and station locations that were initially evaluated during this study are defined in the *Detailed Definition of Alternatives Report*, which was finalized in October 2017. Three alternatives through the NGA/Old North St. Louis neighborhood were included for study (2008 LPA, St. Louis Avenue, and Delmar Boulevard, as shown by the orange, blue, and purple lines, respectively, on Figure 6-1). Subsequent to this report, the study team received community feedback and learned additional details about the pedestrian and vehicle entrances to the new NGA facility.

This input resulted in the addition of an alternative primarily along Cass Avenue through the NGA/Old North St. Louis/Carr Square neighborhood, as shown on Figure 6-1 (green line).
Figure 6-1: Alignment Options through the NGA/Old North St. Louis Neighborhood
The Cass Avenue alternative would travel along Natural Bridge Avenue before turning south on Parnell Street to Jefferson Street, turning east on Cass Avenue, and then turning south on 14th Street. Station locations for the Cass Avenue alternative through the NGA/Old North St. Louis / Carr Square neighborhood include:

- Natural Bridge & Parnell
- Madison & Jefferson
- Cass & 16th
- 14th & Delmar

Detailed design drawings of the Cass Avenue alternative are provided in Appendix C.

**Cass Avenue Alternative: Key Metrics**

Key metrics for the Cass Avenue alternative were calculated to enable an apples-to-apples comparison with the three previously-defined alternatives through the NGA/Old North St. Louis/Carr Square neighborhood. These metrics reflect data for the full 17-mile corridor, and were calculated using the same data sources and methodologies that were used to evaluate the initial three alternatives, as reported in the *Detailed Evaluation of Alternatives Summary Report* (May 2018) and the six supporting technical memoranda.

There are essentially no significant differences in the technical evaluation results that would dictate the selection of one alternative over another, as shown in Table 6-1. Selection of the alternative(s) in the NGA/Old North St. Louis/Carr Square neighborhood to carry forward for study in the next project phases must, then, rely on the degree to which each meets the project goals, community preference, and neighborhood development plans.

**Table 6-1: Summary of Key Evaluation Metrics for the Full Corridor**

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<th>Via St. Louis Avenue</th>
<th>Via Delmar Boulevard</th>
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<td>81,800</td>
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<td># of Residents (2015)</td>
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<td>82,200</td>
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Why is the Cass Avenue Alignment an Option to Study Further?

The Cass Avenue alignment meets the goals of the Northside-Southside Study, as defined in the *Purpose and Need Report*:

**Project Need #1: Stabilization, Revitalization, and Redevelopment of Key Areas**

- The Cass Avenue alternative best aligns with community investment strategies, including the Choice Neighborhoods designation.

- The Cass Avenue alternative serves the Old North and Carr Square neighborhoods.

**Project Need #2: Expanded Access to Jobs and Activity Centers**

- The Cass Avenue alternative best serves the pedestrian entrances to the NGA campus.

- The Cass Avenue alternative serves both North St. Louis and Carr Square residents and the NGA.
APPENDIX A: GATEWAY FOUNDATION’S ILLUSTRATIVE DESIGN DRAWINGS
APPENDIX B: AMERICA’S CENTER ALTERNATIVE DESIGN DRAWINGS
LEFT TURN ONTO 11TH STREET ELIMINATED

NEW SIGNALIZED INTERSECTION

LUCAS AVE.

PROVIDE MIN. 6' CLEARANCE BROOM BUILDING

PROVIDE 22' SIDEWALK TO ACCOMMODATE 85' TURNING RADIUS

PARKING LANE

WASHINGON AVE
10TH STREET - SIDE PLATFORM
DOUBLE TRACK

<table>
<thead>
<tr>
<th>60' R.O.W.</th>
<th>SW/ PLATFORM</th>
<th>GUIDEWAY</th>
<th>SW/ PLATFORM</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>17'-23'</td>
<td>20'</td>
<td>17'-23'</td>
</tr>
</tbody>
</table>

10TH STREET - SIDE PLATFORM
SINGLE TRACK

<table>
<thead>
<tr>
<th>60' R.O.W.</th>
<th>SW</th>
<th>GP</th>
<th>GP</th>
<th>GUIDEWAY</th>
<th>SW/ PLATFORM</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>10'</td>
<td>11'</td>
<td>11'</td>
<td>11'</td>
<td>17'</td>
</tr>
</tbody>
</table>
10TH STREET - DOUBLE TRACK

10TH STREET - SINGLE TRACK
APPENDIX C: CASS AVENUE ALTERNATIVE DESIGN DRAWINGS
## TABLE OF CONTENTS

| SEGMENT 3 TYPICAL SECTIONS (NGA OPTION 3) | TS-035 TO TS-038 |
| SEGMENT 3 PLAN AND PROFILES (NGA OPTION 3) | PP-332 TO PP-336 |
Typical Sections

Date: 5/7/2018

Cass-TS-036.dgn

As Noted

Northside - Southside
Study
Segment 3
NGA Option 3
Typical Sections

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PLAN AND PROFILE
NGA OPTION 3
SEGMENT 3
NORTHSIDE - SOUTHSIDE
STUDY
ST LOUIS
ST LOUIS
6'-6"
7'-0"
7'-0"
27'-0"
6'-6"
10'-0"
10'-0"
6'-0"
6'-0"
BIKE LANE
BIKE LANE
R/W
R/W
EXISTING 80' R.O.W.
VARIES
VARIES
(CASS TO CARR)
14TH STREET
(CASE TO CASE)
LEGEND:
EXISTING SIGNALIZED INTERSECTION
PROPOSED SIGNALS AT INTERSECTION

NORTH SIDE - SOUTH SIDE
STUDY
SEGMENT 3
NGA OPTION 3
PLAN AND PROFILE
STA 2080+00 TO STA 2105+00

CONCEPTUAL
ONLY
NOT FOR
CONSTRUCTION

- THIS MEDIA SHOULD NOT BE CONSIDERED A CERTIFIED DOCUMENT -