

MIDTOWN CORRIDOR STUDY FINAL DRAFT SUMMARY

PHASE I – TRAFFIC CIRCULATION SUMMARY AND CONCLUSIONS

This traffic and circulation portion of the study has examined the potential for closing specific bridges spanning the Midtown Corridor to vehicular and/or pedestrian/bicycle traffic and the potential impacts of these modifications to transportation mobility, access, and circulation. A detailed Year 2030 traffic analysis was undertaken which generally demonstrated relatively small impacts to nearby intersection levels of service. The two main exceptions to this are that a Columbus Avenue bridge closure would impact delay for one intersection movement that would operate at LOS E, and an 11th Avenue bridge closure would impact two intersections with movements and/or approaches projected to operate at LOS E.

A wide range of other access and circulation-related criteria were used to evaluate the potential of each candidate bridge for full closure or a change in use to pedestrian/bicycle only access. These included criteria relating to emergency vehicle access and circulation, pedestrian/bicycle access and circulation, current and future land use and development access needs, pedestrian-oriented development potential, general vehicle circulation/congestion, average annual daily traffic, and existing transit routes. Based on these criteria, scores were assigned and tabulated for vehicular bridge closures and for change in use to pedestrian/bicycle access only. Table 12 summarizes findings generated in Tables G-1 through G-4 of Appendix H and shows a combined listing of these scores and rankings with potential actions identified for further consideration for each of the candidate bridges.

Based on the combined rankings analysis of potential bridge closures and/or change in use, the following preliminary recommendations are made:

- Consider full closure (i.e., possible removal) of the 15th, 16th, or 17th Avenue bridge (this is the group of bridges with mid-level to high rankings for vehicular closure and relatively lower rankings for a change in use to pedestrian/bicycle access only, as shown in Table 12).
- Consider a change in use to pedestrian/bicycle access only for the Colfax and/or 18th Avenue bridges (this is the group of bridges with relatively higher rankings for both vehicular closure and for a change in use to pedestrian/bicycle access only, as shown in Table 12).
- Due to potential impacts to access, circulation, and congestion, retain full access at the Fremont, Harriet, Pillsbury, Columbus, 11th, and 13th Avenue bridges (this is the group of bridges with relatively low rankings for closure to vehicles, as shown in Table 12).
- Consider a change in use to pedestrian/bicycle access only, OR a full closure at the 12th and 14th Avenue bridges (this is the group of bridges with a mid-level to high ranking for vehicular closure and a mid-level ranking for change in use to pedestrian/bicycle only, as shown in Table 12).

- Consider a change in use to pedestrian/bicycle access only, OR retain full access at the Aldrich Avenue Bridge (this bridge had a higher ranking for pedestrian/bicycle use and a lower ranking for vehicular closure than either the 12th or 14th Avenue bridge).

Table 12. Combined Vehicular Closure and Pedestrian/Bicycle Change in Use Rankings

| West End Bridges | Total Vehicular Closure Score | | Total Ped/Bridge Change in Use Score | | Action for Further Consideration |
|-------------------------|-------------------------------|---------|--------------------------------------|---------|---|
| | Raw Score ¹ | Ranking | Raw Score ² | Ranking | |
| Fremont Ave. S | 13 | 14 | 8 | 1 | Retain Full Access |
| Colfax Ave. S | 29 | 3 | 6 | 3 | Change to Ped/Bike Use Only |
| Aldrich Ave. S | 26 | 7 | 4 | 5 | Possible Change to Ped/Bike or Retain Full Access |
| Harriet Ave. S | 17 | 13 | 0 | 10 | Retain Full Access |
| Pillsbury Ave. S | 19 | 12 | 2 | 7 | Retain Full Access |
| East End Bridges | | | | | |
| Columbus Ave. S | 24 | 10 | 0 | 10 | Retain Full Access |
| 11th Ave. S | 25 | 9 | 4 | 5 | Retain Full Access |
| 12th Ave. S | 28 | 4 | 2 | 7 | Possible Change to Ped/Bike or Full Closure |
| 13th Ave. S | 22 | 11 | 8 | 1 | Retain Full Access |
| 14th Ave. S | 31 | 1 | 2 | 7 | Possible Change to Ped/Bike or Full Closure |
| 15th Ave. S | 30 | 2 | 0 | 10 | Full Closure |
| 16th Ave. S | 27 | 6 | 0 | 10 | Possible Full Closure |
| 17th Ave. S | 26 | 7 | 0 | 10 | Full Closure |
| 18th Ave. S | 28 | 4 | 6 | 3 | Change to Ped/Bike Use Only |

¹ Higher scores indicate more feasible candidates for closure to vehicles.

² Higher scores indicate more attractive candidates for change in use to pedestrian/bicycle only.

Even if an option to utilize the Midtown Corridor is not selected as part of the Southwest Transitway Alternatives Analysis Study, other options for transportation within the corridor may be considered in the future. There are numerous factors which would require extensive engineering to assess the impacts that transit construction would have on the existing bridges. It may be necessary to remove and/or replace some of the existing bridges to implement a transitway, and the HCRRA is cautious that any work planned for the bridges will not impede future uses or alignments of the transportation corridor.

PHASE II STRUCTURAL EVALUATION — CONCLUSIONS BASED ON FIVE STRUCTURES ANALYSED

All five bridges reviewed in this report exhibit degradation of concrete, either through materials used in the original construction or through the environmental exposure of more than 90 years. Once general concrete degradation begins, it is common for further deterioration to be accelerated. These general concrete conditions have left reinforcement bars exposed and unprotected. In this state, the steel reinforcement will more readily oxidize and have less strength. If the steel corrosion and concrete degradation continue, the load carrying capacity of the bridges will be reduced and eventually require the bridges' closure.

Comparison of the sufficiency ratings of the five bridges gives the best overall indicator of the health of each bridge. For these bridges, a sufficiency rating below 40 may indicate an expected life of less than four years, a rating between 40 and 60 may indicate an expected life of four to eight years, and a rating above 60 may indicate a life expectancy of over eight years.

PHASE II IMPACTS OF BRIDGE INFRASTRUCTURE CHANGES TO THE HISTORIC DISTRICT

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Engineers analyzing the bridges along the CM&SP grade separation have found structural and functional problems with virtually every bridge. Although some of the bridges are not immediate candidates for replacement and could be retained for a period of time, it is difficult for the bridge owners to justify significant expenditures to maintain and repair structures with limited life. Ultimately, they recommend replacing or removing every bridge along the corridor. (? SMM)

The bridges are only one of the characteristic features of the historic district. Another, the trackage, has already been lost, leaving the district extremely vulnerable as other changes occur. This makes the stakes higher for the bridges, since their removal can be the tipping point between the district's retaining National Register status and its being delisted.

The integrity of the section of the corridor between Stevens and 11th Avenues has already been compromised beyond redemption. Removal of other bridges would pose a serious threat to the integrity of the remaining sections. The fate of the district from Stevens to Fremont Avenues is perhaps already sealed by the intense pace of redevelopment in this area and the accompanying pressure to transform the corridor's industrial character into something more comfortable for the new, nonindustrial uses.

The best hope for retaining a justifiable district lies in the section east of 11th Avenue. The loss of any bridge in this section, given the integrity problems to the west, could be the last straw for the district. The challenge will be to balance the practical needs and economic realities identified by

engineers and planners with the unique qualities that characterize the irreplaceable resource of the Chicago Milwaukee and St. Paul Railroad Grade Separation Historic District.

SUMMARY OF EXISTING BRIDGE CONDITIONS

The traffic and circulation study has revealed that certain bridges, thought to be early candidates for closure/removal, should be retained for vehicular traffic. These crossings are at Fremont, Bryant, Harriet, Grand, Pleasant, Pillsbury, Oakland, Columbus, 10th, 11th, and 13th Avenues. Other bridges should be reclassified and retained to provide pedestrian and/or bicycle facilities for crossing the Midtown Corridor. These crossings include Colfax and Aldrich Avenues. If these bridges are reclassified within the next several years, the reduction of live loading from vehicular to pedestrian level could promote a longer useful life before replacement may be needed. Five bridges toward the east end of the corridor, 12th, 14th, 15th, 16th, and 17th Avenues, are not projected to be required from a transportation perspective once the bridges' useful lives have expired. Two of these five, 12th and 14th Avenues, are current candidates to be reclassified as pedestrian/bicycle. As noted previously, reducing the live loads could extend the lives of these two bridges.

Bridges reviewed in this report exhibit degradation of concrete, either through materials used in the original construction or through the environmental exposure of more than ninety years. Once general concrete degradation begins, it is common for further deterioration to be accelerated. These general concrete conditions have left reinforcement bars exposed and unprotected. In this state, the steel reinforcement will more readily oxidize and have less strength. If the steel corrosion and concrete degradation continue, the load carrying capacity of the bridges will be reduced and eventually require the bridges' closure.

Rehabilitation and repair techniques, both past and more present methods, were discussed. In the past, the City has utilized some of the current repair practices on the corridor bridges with good success, including shotcrete, patching, and milling the road asphalt surface and placing a new membrane with asphalt overlay. While these methods have been used mostly to stabilize gross foundation issues, deck wearing surfaces, and/or railing issues, they have not completely answered the deterioration of the concrete and reinforcing in the cast-in-place concrete T beam superstructures.

Comparison of the sufficiency ratings of the bridges gives the best overall indicator of the health of each bridge. For these bridges, a sufficiency rating below 40 may indicate an expected life of less than four years, a rating between 40 and 60 may indicate an expected life of four to eight years, and a rating above 60 may indicate a life expectancy of over eight years. Changing the live loading on some of these bridges from vehicular traffic to pedestrian loads could extend the useful life of the bridge anywhere from four to ten years.

RECOMMENDATIONS FOR EACH BRIDGE

The Colfax Avenue and 18th Avenue South bridges should be considered for reclassification to pedestrian and/or bicycle trail bridges. Each structure has an expected life exceeding eight years, and potentially more if their live loadings are reduced to just pedestrian level loadings. These structures should be replaced with a pedestrian or trail style bridge when the existing bridge's useful life has expired

The 12th Avenue and 14th Avenue bridges should be considered for reclassification to pedestrian and/or bicycle trail bridges. Each structure has an expected life exceeding eight years, and potentially more if traffic live loads are removed. These structures should be removed and potentially not replaced at the end of their useful lives.

The Aldrich Avenue bridge could be reclassified as a pedestrian and/or trail bridge or could retain full vehicular access. This structure should be replaced at the end of its useful life, which anticipated at greater than eight years, as either a full vehicular or pedestrian trail bridge.

The remaining bridges should retain full vehicular access. At the ends of their useful lives, they should be replaced with new bridges, except that the 15th, 16th, and 17th Avenue bridges should be considered for full removal without replacement from a traffic viewpoint. The 1st, Portland, and Cedar Avenue bridges should be programmed for replacement, as their anticipated useful lives are less than four years each.

These recommendations for each bridge, timeline and traffic classification topics are summarized on Table 14 below.

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Table 14. Midtown Corridor Planning Study - Hennepin Avenue to Cedar Avenue 2005 DATA - PROGRAMMING IS NOT UP TO DATE

| ORDER (W to E) | BRIDGE LOCATION | ROADWAY CLASSIFICATION | OWNER | RECONSTRUCTED | SUFFICIENCY RATING | SUFFICIENCY RANKING | EXPECTED LIFE BASED ON SUFFICIENCY RATING | ABANDONMENT STUDY CANDIDATE | RETAIN FULL ACCESS | | | RECLASSIFY | | REMOVAL AT E.O.L. | REMARKS |
|-------------------|----------------------|---------------------------|---------|---------------|-----------------------|------------------------|--|--------------------------------|--|-----------------|---------------------------------|--------------------------------------|-----------|----------------------|---------|
| | | | | | | | | | Mn/DOT or MSA or CSA or Newer Bridge | Result of Study | CPED or Physical Limitations | PED/BIKE OR RETAIN FULL ACCESS | Ped./Bike | | |
| 5 | HENNEPIN AVENUE | MSA | CITY | 1980 | 96.9 | 34 | 30+ | | | | | | | | |
| 6 | FREMONT AVENUE SOUTH | LOCAL | HCRRRA | | 31.8 | 4 | <4 | YES | | | | | | | |
| 7 | EMERSON AVENUE SOUTH | MSA | CITY | 1986 | 97.9 | 35 | 30+ | | | | | | | | |
| 8 | DUPONT AVENUE SOUTH | MSA | CITY | 1987 | 96.8 | 33 | 30+ | | | | | | | | |
| 9 | COLFAX AVENUE SOUTH | LOCAL | HCRRRA | | 64.2 | 14 | >8 | YES | | | | | | | |
| 10 | BRYANT AVENUE SOUTH | LOCAL | HCRRRA | | 75.1 | 18 | >8 | YES | | | | | | | |
| 11 | ALDRICH AVENUE SOUTH | LOCAL | HCRRRA | | 86.8 | 29 | >8 | YES | | | | | | | |
| 12 | LYNDALE AVENUE SOUTH | CSA | COUNTY | 1987 | 86.0 | 28 | 30+ | | | | | | | | |
| 13 | GARFIELD AVENUE | LOCAL | CITY | 1992 | 95.9 | 31 | 40+ | | | | | | | | |
| 14 | HARRIET AVENUE | LOCAL | HCRRRA | | 69.2 | 16 | >8 | YES | | | | | | | |
| 15 | GRAND AVENUE | LOCAL | HCRRRA | | 61.2 | 12 | >8 | YES | | | | | | | |
| 16 | PLEASANT AVENUE | LOCAL | HCRRRA | | 51.4 | 9 | 4 - 8 | YES | | | | | | | |
| 17 | PILLSBURY AVENUE | LOCAL | HCRRRA | | 88.7 | 30 | >8 | YES | | | | | | | |
| 18 | BLAISDELL AVENUE | MSA | CITY | 1982 | 99.2 | 36 | 30+ | | | | | | | | |
| 19 | NICOLLET AVENUE | LOCAL | HCRRRA | | 47.0 | 8 | 4 - 6 | | | | | | | | |
| 20 | 1ST AVENUE SOUTH | MSA | HCRRRA | | 30.8 | 3 | <4 | | | | | | | | |
| 21 | STEVENS AVENUE | LOCAL | HCRRRA | | 56.1 | 10 | 4 - 8 | | | | | | | | |
| 22 | I-35W (MAINLINE) | MNDOT | STATE | 1967 | 85.3 | 27 | 20+ | | | | | | | | |
| 23 | 2ND AVENUE SOUTH | MSA | CITY | 1982 | 80.6 | 24 | 30+ | | | | | | | | |
| 24 | 4TH AVENUE SOUTH | MSA | HCRRRA | 1997 | 99.8 | 37 | 40+ | | | | | | | | |
| 25 | PORTLAND AVENUE | CSA | HCRRRA | | 36.5 | 6 | <4 | | | | | | | | |
| 26 | OAKLAND AVENUE | LOCAL | HCRRRA | | 96.0 | 32 | >8 | YES | | | | | | | |
| 27 | PARK AVENUE | CSA | HCRRRA | 2005 | 28.5 | 4 | 70+ | | | | | | | | |
| 28 | COLUMBUS AVENUE | LOCAL | HCRRRA | | 45.8 | 7 | 4 - 8 | YES | | | | | | | |
| 29 | CHICAGO AVENUE | MSA | HCRRRA | 2004 | 28.6 | 2 | 70+ | | | | | | | | |
| 30 | ELLIOT AVENUE | PRIVATE | PRIVATE | | 77.0 | 20 | PRIVATE | | | | | | | | PRIVATE |
| 31 | 10TH AVENUE SOUTH | LOCAL | HCRRRA | | 61.9 | 13 | >8 | YES | | | | | | | |
| 32 | 11TH AVENUE SOUTH | LOCAL | HCRRRA | | 80.7 | 25 | >8 | YES | | | | | | | |
| 33 | 12TH AVENUE SOUTH | LOCAL | HCRRRA | | 78.3 | 20 | >8 | YES | | | | | | | |
| 34 | 13TH AVENUE SOUTH | LOCAL | HCRRRA | | 69.0 | 15 | >8 | YES | | | | | | | |
| 35 | 14TH AVENUE SOUTH | LOCAL | HCRRRA | | 79.4 | 22 | >8 | YES | | | | | | | |
| 36 | 15TH AVENUE SOUTH | LOCAL | HCRRRA | | 74.7 | 17 | >8 | YES | | | | | | | |
| 37 | BLOOMINGTON AVENUE | MSA | HCRRRA | | 76.4 | 18 | >8 | | | | | | | | |
| 38 | 16TH AVENUE SOUTH | LOCAL | HCRRRA | | 83.8 | 26 | >8 | YES | | | | | | | |
| 39 | 17TH AVENUE SOUTH | LOCAL | HCRRRA | | 80.0 | 23 | >8 | YES | | | | | | | |
| 40 | 18TH AVENUE SOUTH | LOCAL | HCRRRA | | 60.7 | 11 | >8 | YES | | | | | | | |
| 41 | CEDAR AVENUE | CSA | HCRRRA | | 36.4 | 5 | <4 | | | | | | | | |

- NEW BRIDGES (BUILT SINCE 1967)
- BRIDGES IN 5 YEAR CAPITAL IMPROVEMENTS PROGRAM
- BRIDGES TO CONSIDER FOR INCLUSION IN CAPITAL IMPROVEMENTS PROGRAM

FINAL CONCLUSIONS

The City of Minneapolis Public Works Department and Hennepin County have conducted a study of the bridges of the Midtown Corridor to address Stipulation 3 of the Section 106 Memorandum of Agreement (MOA) Between the Federal Highway Administration and the Minnesota State Historic Preservation Office Related to Bridge Replacement Project S.P. 141-165-15. This study has included a planning study for the bridges of the historic district, a review of potential repair or rehabilitation limitations, a narrative of the original construction methods, and a discussion of foreseeable effects of additional bridge removals/changes of use on the historic district.

While review of these bridge structures is an attempt to formulate a course of action for the foreseeable future, bridge rehabilitation or replacement is a process that longer than the three-year period set forth in Stipulation 6 of the MOA, which reads:

If the terms of this agreement have not been implemented 3 years after signature, this agreement should be null and void. In such event, FHWA shall notify the parties of this agreement of the expiration, and if appropriate, shall re-initiate review of the undertaking in accordance with 36CFR 800.7(c)(4) and Section 110(1) of NHPA.

The City, along with Hennepin County, is therefore hopeful that meeting the terms of this MOA will provide a basis for future bridge work without the need for any significant new stipulations in future project MOAs.

It must also be realized that the City Council cannot approve any project without encumbering funding for that project and that most of the bridge work discussed in this report, outside of normal maintenance, is beyond the tenure of the existing Council. The City Council, therefore, cannot pass any resolutions binding them to the funding of any bridge projects that will occur beyond their immediate tenure.

The HCRRA purchased the Midtown Corridor for the potential use of future transit, with special consideration for preserving the corridor for future LRT or bus rapid transit. HCRRA is cautious that any work planned for the bridges will not impede future uses or alignments of the transportation corridor. The current Southwest Transitway Alternatives Analysis Study, to be finalized in late 2006, will identify transitway options that may utilize a portion of the Midtown Corridor. Sufficient engineering has not been performed to determine the specific modifications to the existing bridges that might be needed for a transitway. It may be necessary to remove and/or replace some of the existing bridges to implement a transitway. Even if an option utilizing the Midtown Corridor is not selected as part of the Southwest Transitway Alternatives Analysis Study, other options for rail transportation within the corridor may be considered in the future, and the extent to which they would impact the existing bridges cannot be determined at this point in time.