Non-motorized Crossings Analysis
APPENDIX T12 –
NON-MOTORIZED CROSSINGS ANALYSIS

Introduction

The original construction of I-94 severed a regularly spaced grid of pedestrian scale streets through many residential neighborhoods and replaced it with a much less-frequent spacing of streets that cross the freeway and often carry considerable volumes of motor vehicle traffic. As a result, walking and bicycling trips became longer and required crossing the freeway on facilities that were often less comfortable and possibly less safe. The purpose of the non-motorized crossings analysis is to review and document the existing pedestrian and bicycle crossings in the Rethinking I-94 study area and identify a framework to guide future crossing improvement investments. The framework emphasizes serving the needs of those who are mostly likely to rely on pedestrian and bicycle travel (including access to transit) to meet their basic transportation needs.

This analysis of non-motorized crossings in the corridor was initiated in response to stakeholder input regarding the barrier to pedestrian and bicycle movement presented by the freeway and the desire to improve multimodal connectivity between and among I-94 communities.

The methodology for the analysis evolved over time, with input from the Rethinking I-94 Planning and Land Use Working Group and the TAC. Ultimately, the key components of the work were:

- Crossings Inventory
- Spacing Analysis
- User Needs Indicators
- Crossing Improvement Principles
- Types of Potential Improvements

Each of these is described below.

Crossings Inventory

Attachment 1 provides an inventory of the 67 street, trail, or rail crossings over or under I-94 between West Broadway Avenue in Minneapolis and Highway 61 in St. Paul. The crossings are spread over a 15-mile distance and have multiple owners and widely varying characteristics. The purpose of developing a crossing inventory was to bring all relevant information about the crossings into a single location for use by MnDOT staff as well as agency partners and community members. The inventory provides the following information for each crossing:

- Descriptive information (location, year built, owner, etc.)
- Existing pedestrian and bicycle facilities (including dimensions where available)
• Planned bicycle facilities
• Transit information (transit routes and proximity to regional transit)
• Americans with Disabilities Act (ADA) accommodations
• Other designations

Two figures were developed to accompany the inventory. Figure 1 shows the location of all 67 crossings that include pedestrian and/or bicycle facilities. Figure 2 identifies the crossings by facility type (pedestrian, bicycle, over-crossing, undercrossing, railroad, etc.).

A potential next step in this analysis would be to assess the adequacy of the existing crossing facilities with respect to condition, function, safety, etc. While such an effort was beyond the scope of work for Phase 1 of Rethinking I-94, the spreadsheet tool provides the initial basis for such an assessment.

Spacing Analysis

To consider adequacy of the distance between existing crossings, the study team produced a series of three maps that visually identify gaps between crossings of ½ mile, ¼ mile, or 1/8 mile, as shown in Figures 3, 4, and 5, respectively. The ½ mile spacing analysis shows only one location in the corridor where the distance between crossings is greater than ½ mile (near TH 280). The ¼ mile analysis shows three areas where spacing is greater than ¼ mile: north of Dunwoody Blvd in Minneapolis, near TH 280, and east of downtown St. Paul. The 1/8 mile spacing analysis shows that for most of the corridor, crossing spacing is greater than 1/8 mile. This spacing information can be incorporated into a more robust walkshed analysis to understand how the spacing of crossings influences trip time and length for non-motorized users.

The fourth map in the spacing analysis highlight the existing street grid (including existing street crossings of I-94) to visually highlight locations where a pedestrian scale street grid may be intact but where there are relatively few crossings (Figure 6).
Figure 1. Existing Pedestrian, Bicycle, and Multimodal Crossings of I-94
Figure 2. Existing Pedestrian, Bicycle, and Multimodal Crossings of I-94, by Type
Figure 3. Distance to Next Crossing - Gaps Greater than 1/2 Mile to Next Crossing

Legend
1/4 mile buffer around existing crossing

Gap to next crossing is visible when distance between crossings exceeds 1/2 miles.
Figure 4. Distance to Next Crossing - Gaps Greater than 1/4 Mile to Next Crossing

Legend
- 1/8 mile buffer around existing crossing

Gap to next crossing is visible when distance between crossings exceeds 1/4 miles.
Figure 5. Distance to Next Crossing - Gaps Greater than 1/8 Mile to Next Crossing

Legend

1/16 mile buffer around existing crossing

Gap to next crossing is visible when distance between crossings exceeds 1/8 miles.
Figure 6. Street Grid Pattern, and Crossings of I-94
User Needs Indicators

The next layer of analysis uses available socioeconomic data as potential indicators of populations that are more reliant on walking, transit, and bicycling for their basic transportation needs. Factors used as potential indicators are described below:

- **Poverty (Figures 7 and 8):** Census tracts where 40% or more of residents with family or individual incomes less than 185% of the federal poverty threshold (in 2016 this was $45,442 for a family of four and $22,622 for an individual living alone). A subset of this analysis excludes tracts with a large share of college or graduate students who may report very low income but have other sources of support.
- **Racial Minority (Figure 9):** Census tracts where more than 50% of the population are defined as minority by U.S. Census definitions.
- **People of Color Experiencing Concentrated Poverty (Figure 10):** This measure shows census tracts where the first two potential indicators of transportation need are combined into a single measure.
- **Low Wage Worker Household Density (Figure 11):** Shows concentrations of households where workers have earnings of $40,000 annually or less, based on the U.S. Census Longitudinal Employer-Household Dynamics (LEHD) program.
- **Transit Dependent Populations (Figure 12):** Using the American Community Survey (ACS) 5-year summary file, this map shows the percent of households with zero motorized vehicles available.

Cursory analysis of these maps suggests that are geographic areas with populations where more than one of these indicators is present. Linking these areas to a combined walkshed and crossings map could be used to identify locations where investments in crossings would be more likely to benefit populations that are more dependent on walking, bicycling and transit to meet their basic transportation needs.
Figure 7. Areas of Poverty Concentration

Legend
Poverty concentration (per tract)
- >40% poverty

Data source: US Census, Metropolitan Council, Mn Geospatial Commons
Figure 8: Areas of Non-Student Poverty Concentration

Legend
- Non-student poverty concentration (per tract)
- >40% poverty

Data source: US Census, Metropolitan Council, Mn Geospatial Commons
Figure 9: Areas of Minority Concentration

Legend

Minority concentration (per tract)
>50% minority

Data source: US Census, Metropolitan Council, Mn Geospatial Commons
Figure 10: Areas of Poverty Concentration, of Minority Concentration, and Both

Legend
- Poverty and minority concentration (per tract)
  - >40% non-student poverty
  - >50% minority
  - >40% non-student poverty AND >50% minority

Data source: US Census, Metropolitan Council, Mn Geospatial Commons
Figure 11: Density of Low Wage Worker Households, Per Acre

Legend
Density of low wage worker households (per acre)

- 0 to 2
- 2 to 3.9
- 4 to 5.9
- 6 to 7.9
- 8 or more

Data source: US Census, Metropolitan Council, Mn Geospatial Commons
Figure 12: Transit-dependent Households

Legend

Percent of HH zero motor vehicles

- 0 - 12 %
- 12 - 24 %
- 24 - 36 %
- 36 - 48 %
- 48 - 60 %

Data source: US Census, Metropolitan Council, Mn Geospatial Commons

Print date: 05/09/18
Crossing Improvement Factors

Although this initial phase of Rethinking I-94 does not identify new crossings or improvements to existing crossings, the study team and stakeholder committees prepared two sets of factors that could be used to prioritize future investments. While these principles include input from the TAC and the Planning and Land Use Working Group, they are considered preliminary until a more thorough input process is conducted.

**DRAFT FACTORS SUGGESTING A CROSSING NEED**

- Presence of equity and vulnerable populations, including high-poverty, high minority populations and concentrations of seniors, children, and ADA populations
- Proximity to residential concentrations
- Proximity to employment concentrations
- Proximity to destinations
  - Consider schools, parks, places of worship, grocery and other stores, colleges and universities, entertainment centers, etc.
- Distance to next crossing
- Pedestrian/bicycle trip generators
- User safety and comfort
- Others to be identified

**DRAFT FACTORS SUGGESTING CROSSING LOCATION PRIORITY**

- Crossing would address the needs of equity and vulnerable populations, including high-poverty, high minority populations and concentrations of seniors, children, and ADA populations
- Addresses user comfort / safety / convenience
- Connects or is part of local or regional walk / bike networks
- Serves a large number of people
  - Population density
  - Employment density
- Connects to / provides access to mass transit
- Serves transit-dependent households
- Connects to schools and libraries
- Is identified as a priority in a local or regional plan
- Cost effectiveness
- Others to be determined
Types of Potential Improvements

While no recommendations for crossing improvements are being made during this phase of study, the study team sought to define the types of improvements that could be made in any given location. Table 1 provides the menu of options that could be considered.

Table 1. Potential Crossing Improvement Types

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<th>Type</th>
<th>Description</th>
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<td>MINIMUM STANDARD</td>
<td>Improve to minimum standard, as agreed upon by the involved jurisdictions</td>
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<td>LOW-COST ADDITIONS</td>
<td>Low-cost additions could significantly enhance function (even if facility meets standards or was recently improved)</td>
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<tr>
<td>ENHANCED FACILITY</td>
<td>Provide enhanced facility that goes beyond minimum standards</td>
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<td>UNIQUE TREATMENTS</td>
<td>Potential for unique treatments (extra width, addition of art or other aesthetic features, etc.) based on context, community interests, partnerships, etc.</td>
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<tr>
<td>NEW</td>
<td>Potential for a new crossing that does not exist today</td>
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Conclusions

The crossings analysis is an example of the adaptive approach taken in Rethinking I-94 in that additional analysis was undertaken on this issue as the engagement process identified the degree of stakeholder interest in crossings and potential crossing improvements.

This first phase of crossings analysis developed an inventory of existing crossings that is intended to be used by MnDOT and stakeholders as individual projects and needs are identified. The analysis also identifies factors that should be considered to guide future investments.

Prepared by: WSP, Community Design Group
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Rethinking I-94 Crossing Inventory (as of 5-22-2018)
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