Appendix F

Ann Arbor
Lower Town Mobility Study

Pedestrian Crossing Analysis
(NCHRP 562)

memorandum

Date: February 2, 2021

To: Luke Liu, PE
cc: Steven Loveland, PE, PTOE
From: Stephen Dearing, PE, PTOE

Re: Review of Pedestrian Crossings in Lower Town

Background:

One of the requirements of the City in their Request for Proposals was for an evaluation of all uncontrolled crossings within the Study Area in accordance with NCHRP 562. The purpose was to propose recommended pedestrian crossing treatments for existing locations and to identify new locations where such crossings are needed.

NCHRP 562 Improving Pedestrian Safety at Unsignalized Crossings reports on the research into recent developments in geometric design features, traffic control devices, and technologies to improve pedestrian safety. As noted in its title, it does not deal with pedestrian crossings at signalized intersections. It also explicitly excludes consideration of school crossings, since school safe walking routes have different characteristics meriting different treatments. Rather, it looks at pedestrian crossings for general public use and investigate the effectiveness of approaches to their safety. Based on the research, it recommends selected engineering treatments to improve safety for pedestrians crossing high-volume, high-speed roadways at unsignalized intersections. It also developed guidelines for use in selecting pedestrian crossing treatments for unsignalized intersections and midblock locations.

NCHRP 562 offers quantitative procedures. In the guidelines, key inputs include variables (such as pedestrian volume, street crossing width, and traffic volume) to recommend one of four possible crossing treatment categories: marked crosswalk; enhanced, high-visibility, or “active when present” traffic control device; red signal or beacon device; and conventional traffic control signal. To facilitate use of the guidance, an Excel spreadsheet was made available from the authors of NCHRP 562.

The use of NCHRP 562 is intrinsic to the city’s process of determining the design standards to be implemented for pedestrian crossings. The City’s design guidelines are stratified into three categories: Standard, Standard Plus and High Risk. The choice of various treatments would then be further refined depending on the functional classification and characteristics of the roadways to be crossed. The process and design guidelines are encompassed in a city document called ***Ann Arbor Pedestrian Crossing Guidelines Quick Sheets***, dated January 15, 2019.

The spreadsheet available for implementing NCHRP 562 was inconvenient to use, so a new spreadsheet was created for this project. The new Excel file incorporates not only the logic structure of the NCHRP 562 guidance but also that of Ann Arbor’s Pedestrian Crossing Guidelines. So the outputs of this new spreadsheet are both one of the four NCHRP 562 treatment categories and the corresponding Ann Arbor set of three design guidelines.

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Existing Crossings Evaluation:

A total of 31 existing pedestrian crossings were evaluated. This number is a fraction of the total pedestrian crossings in the study area. Excluded from the evaluation were those at intersections under traffic signal control, as well as those that represent the crossings of local streets. Examples of each would be Broadway St at Swift St and Chandler Rd at Indianola Ave, respectively. For the former type locations, the Ann Arbor set of design guidelines do not apply, and for the latter, there is no usage data for vehicle volumes and pedestrians to make for a meaningful analysis.

Of the locations that were evaluated, the traffic data collection effort for this project was able to supply vehicle volume and pedestrian crossing data for some. Within each corridor being analyzed, it was possible to assume that vehicle volumes at uncounted locations would be approximately the same order of magnitude for the locations in the same corridor where we had counts. The crossing distances for the pedestrian crossings were obtained from aerial mapping. So the single biggest unknown for 20 locations was the pedestrians per hour using the crossings. We found that the outcome in terms of Ann Arbor crossing design guidelines was not particularly sensitive to this data input within the range of likely pedestrian usage values.

From the evaluation, we found that one location, Maiden Lane at Island Drive, merited a **Standard Plus** treatment. Given the traffic controls currently in place, this location has but one deficiency. We recommend that pedestrian warning signs (W11-2) should be added here. All other locations were evaluated as meriting **Standard** treatment. However, not all of these locations had such treatments currently in place. The following are locations where high visibility crosswalk markings should be installed:

- Across Barton Dr at Starwick Dr.
- Across Pontiac Trail at Montana Way
- Across Pontiac Trail at Polson St
- Across Traver St at Moore St

There are two locations that merit additional discussion. From the list above, the crossing of Barton at Starwick Drive is proximate to Barton having a sharp horizontal curve that limits sight distance, especially for eastbound traffic. There is an existing key walk extending from the sidewalk to the curb in front of 900 Barton. To use this location for a pedestrian crossing, the City would need to add a ramp on this side (southwest) and then the ramp and walk across the street (northeast) in front of 901 Barton. However, it would be better for sight distance visibility to the crosswalk to shift the crossing about 40 feet to the northwest, so it would be just north of the driveway to 901 Barton. While improving sight distance, it would be advantageous to add advance warning for eastbound Barton by way of a pedestrian warning sign with an AHEAD plaque (W11-2 plus W16-9P).

The second location is on Barton Dr at the boardwalk opening between M-14 and Brede Place, near the driveway for 221 Barton Dr. Unfortunately, other than the boardwalk, there are no sidewalks along this segment of Barton. So there is no pedestrian facility to connect a crosswalk to. But respecting that the boardwalk opening will be focal point for pedestrians, we recommend that pedestrian warning signs (W11-2) should be added with the plaque NEXT 800 FEET (W16-4P). The sign for eastbound should be installed just east of the EB M-14 ramps. Westbound signage should be placed about 110 feet east of the driveway for 221 Barton Dr.

Potential New Locations:

We next considered the study area to identify where new pedestrian crossings would be merited. One key consideration was providing convenient crossing locations to be able to access public transit bus stops. Another consideration was the spacing and distance between existing pedestrian crossings as a representation of adverse travel to be able to cross major streets.

With these factors in mind, we identified four locations where new pedestrian crossings should be provided. They are:

- Across Pontiac Trail at Skydale Dr
- Across Pontiac Trail at Rudolf Steiner School south driveway
- Across Pontiac Trail at Northside Ave
- Across Swift St at Pontiac Trail

Skydale was chosen to represent a close intersection to serve transit users boarding and alighting at the bus stop between Skydale and Arrowwood Trail, while avoiding the driveways adjacent to Arrowwood Trail. The Rudolf Steiner School south driveway was chosen to try to service both the school and the bus stop on the east side with one crossing. Northside Ave represents an almost halfway point between the existing crossings at Barton and at Brookside and a reasonably close point for the bus stop at Starwick. Finally, the proposed crossing of Swift St at Pontiac Trail is of the north leg of this intersection.

We then evaluated these locations for the appropriate treatment categories, and in turn the design guidelines. All locations were judged to merit **Standard** treatments. In their cases, this means that high visibility crosswalk markings should be installed.