Memo | Memphis STP Pedestrian Sidewalk Project

To: Kyle Wagenschutz, City of Memphis
CC:
From: Jean Crowther, Collin Chesston, John Cock, Alta Planning + Design
Date: November 11th, 2014
Re: Pedestrian Count Locations and Methodology (Task 2.3)

Introduction

Annual counts conducted in a systematic manner provide benchmarking information on walking activity and related benefits. Count data adds to the understanding of existing pedestrian travel patterns, preferences, and needs. This allows for more strategic planning of future walkway investments and provides a means of evaluating the impact of programs and facilities. While count data will not provide comprehensive mode share data, it offers a snapshot of peak pedestrian activity on a typical day. It can also provide important baseline data for before-after studies where new investments are planned and provide insight into overall trends in the Memphis walking environment over time.

This memorandum outlines a proposed pedestrian count methodology and process for implementation. The approach is based on the National Bicycle and Pedestrian Documentation project, an annual bicycle and pedestrian count and survey effort (www.bikepeddocumentation.org). However, the count methodology and forms have been revised to meet specific needs related to the current plan – to document pedestrian activity related to the use of marked pedestrian crossings at signalized, unsignalized, and midblock locations. In particular, many pedestrians in Memphis can be observed crossing near but not within marked pedestrian crossings. While this has likely become part of the culture in Memphis, it is surmised that the availability of pedestrian infrastructure is likely influencing pedestrian habits. The count methodology used in this plan establishes a baseline that can be used to track changes in the number and share of pedestrians using provided crossings as new pedestrian enhancements are made.

Pedestrian Counts Program

A regular pedestrian count program is instrumental for measuring change over time. This empirical data can be used to monitor implementation of the recommendations of the Memphis STP Pedestrian Project and its impact on Memphis residents and visitors. The purpose of initiating a count program in Memphis is to gather important benchmarking information about walking rates as well as behaviors, including the use of marked pedestrian crossings. This information is useful to City staff and local and regional stakeholders for understanding whether there is an association between plan implementation and walking activity and behaviors.

A manual count program, with annual data collection efforts, requires the partnership of community members. Counters can be volunteers or agency staff, as long as proper training and support is provided. The initial counts following the methodology outlined here were completed by students of University of Memphis' professor Dr. Stephanie Ivey, with training provided by Alta staff. The University of Memphis may continue to administer volunteer counters in the future. Other potential partners in Memphis include:

- Other institutions of higher education such as Christian Brothers University (especially departments or institutes related to public health, planning, transportation, and engineering)
- Walking and/or transit advocates; running clubs
- Safe Routes to School volunteers
- Nonprofit organizations related to active transportation or outdoor recreation including Wolf River Greenway and Livable Memphis
- Advisory committees such as the Memphis MPO Active Transportation Advisory Committee

The following section identifies a recommended methodology for pedestrian counts that has been conducted in the fall of 2014 as part of the Memphis STP Pedestrian Project.

Data Collection Methodology

This section provides a recommended count methodology, including count dates and times, pre-count preparation steps, and resources that will help agency staff with the manual count effort. The end of this section identifies 20 proposed locations to include in the manual count program, where initial counts were completed in the fall of 2014.

Count Type

The National Bicycle and Pedestrian Documentation Project (NBPD) recommends 'screenline' counts, which provide corridor-specific data and are relatively simple to conduct and analyze over time. However, for this plan, **Alta proposed that the City of Memphis conduct intersection counts, which record pedestrian activity on two streets as well as turning movements between them**. While this approach is slightly more complicated and requires two volunteers at each location, it will be more useful data for documenting pedestrian crossing activity. Specifically, intersection counts provide a means of documenting pedestrian behaviors in areas where there are potential conflicts with vehicles and how frequently pedestrians are making use of marked pedestrian crossings.

Through the current planning process, Alta has observed that many pedestrians do not cross at intersections or marked crossings. This behavior may be indicative of a need for additional pedestrian crossing opportunities or for additional enhancements to improve conditions for pedestrians at existing signalized intersections or other marked crossings. **Intersection counts will provide information about location-specific pedestrian behaviors, while also documenting general trends in pedestrian volumes (where pedestrian activity is occurring and where it is not), and provide a basis for understanding how demographics, land use, and other factors influence pedestrian travel.** The count form developed for Memphis includes space for the volunteer counters to document activity at the intersection, while also separately counting those pedestrians crossing near, but not at the marked crossing.

Count Dates and Times

Alta recommends that Memphis complete counts on the national count dates, which in Fall 2014 were September 9-14. The National Count Dates represent a peak period for walking and bicycling, in which weather conditions across the country are generally conducive, schools and colleges have been underway for several weeks, and people have returned from vacations and are back at work.

Counts are typically to be conducted on a weekday, when school is in session. NBPD recommends that counts be conducted on a Tuesday, Wednesday or Thursday. Counts at the 20 locations in this study could have been conducted on any of the above days.Counts were performed during the same week, but not all counts were conducted on the exact same day. This provides agencies, organizations and volunteers with scheduling flexibility. The initial counts took place during the NBPD recommended weekday afternoon peak period of 5-7 PM. **Note that it is important that count data reflect the same time periods for all future counts of this type in order to be consistently compared over time**

Table 1 below summarizes Memphis's count dates and times:

Table 1 – Fall 2014 count dates and times

Day	Date	Time
Weekday (Tuesday, Wednesday, or Thursday)	September 9, 10, 11[1]	5:00 PM to 7:00PM

Count Forms

The attached count form (Appendix B) was used by all intersection counters. The form provides a place for counters to document crossing movements at each leg of the intersection, whether it occurs within the crosswalk or outside of it. The "notes" section on the form provides specific spaces for documenting:

- Pedestrians identified as youth (estimated to be under the age of 18)
- Pedestrians that use the push-button pedestrian signal (a cumulative tally of all uses)
- Additional comments (such as faded crosswalks, observed conflicts between pedestrians and vehicles, or if pedestrians are commonly unable to complete the crossing in the allotted 'Walk' time.)

Alta hosted a counter training on September 2nd to instruct all volunteers and staff in using the count form and collecting consistent data across all count locations.

Count Locations

Recommended Count Locations

The NBPD website provides guidelines for selecting count locations, based on access to transit, proximity to main entrances for shopping or employment areas, and high density downtown or residential areas. For Memphis, Alta prioritized locations meeting one or more of the following criteria related to the Memphis Pedestrian Sidewalk Program:

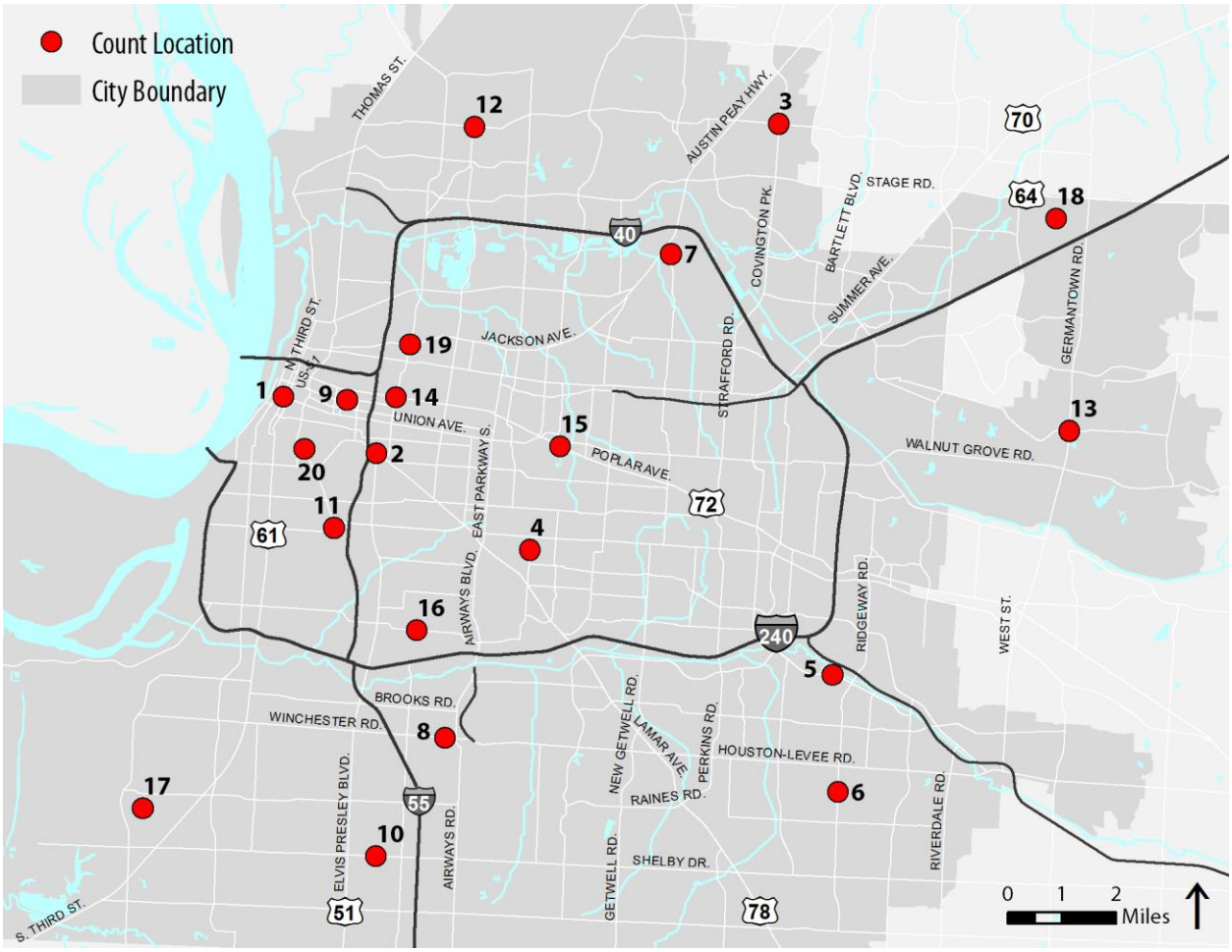
- High crash intersections (5 locations)
- Locations identified in a school survey of pedestrian needs (2 locations)
- Planned and funded capital improvement project (1 locations)
- Minor or minimally controlled crossing, such as a zebra crossing of an arterial (3 locations)
- City and stakeholder input (2 locations)
- Locations serving many destinations based on the shortest path analysis (7 locations)

[1] These dates are for 2014. The national count dates for future years can be found on the NBPD website (www.bikepeddocumentation.org)

Table 2 - Proposed Count Locations

Map ID	Street	Cross-Street	Reason for Location
1	Union St	Second St	High crash intersection
2	Lamar Ave	Bellevue Blvd	High crash intersection
3	Covington Pk	Yale Rd	High crash intersection
4	Pendleton St	Deadrick Ave	High crash intersection
5	Mt. Moriah Rd	Pickering Dr	High crash intersection
6	Hickory Hill Rd	Ridgeway Blvd	School survey comment
7	Wales Ave	Graham St	School survey comment
8	Winchester Ave	Boeingshire Dr	Minimally controlled crossing
9	Jefferson Ave	Btn Dunlap & Adams	Minimally controlled crossing
10	Shelby Dr	Btn Woodridge & Southmall	Minimally controlled crossing
11	South Parkway	Mississippi Blvd	Shortest Path Analysis
12	Frayser Blvd	Overton Crossing St	Shortest Path Analysis
13	Germantown Pkwy	Trinity Rd	Shortest Path Analysis
14	Poplar Ave	Cleveland St	TAC suggestion
15	Poplar Ave	Btn Fenwick & Tishomingo (3030 Poplar Ave)	Planned capital improvement project
16	Manchester Rd	Ball Rd	City suggestion
17	Western Park Dr	Westmont St	Shortest Path Analysis
18	Kate Bond Road	Deerfield Trace	Shortest Path Analysis
19	Jackson Ave	Watkins Street	Shortest Path Analysis
20	Mississippi Blvd	Georgia Ave/Lauderdale Ave	Shortest Path Analysis

Figure 1: Proposed Count Locations



Summary of Count Results

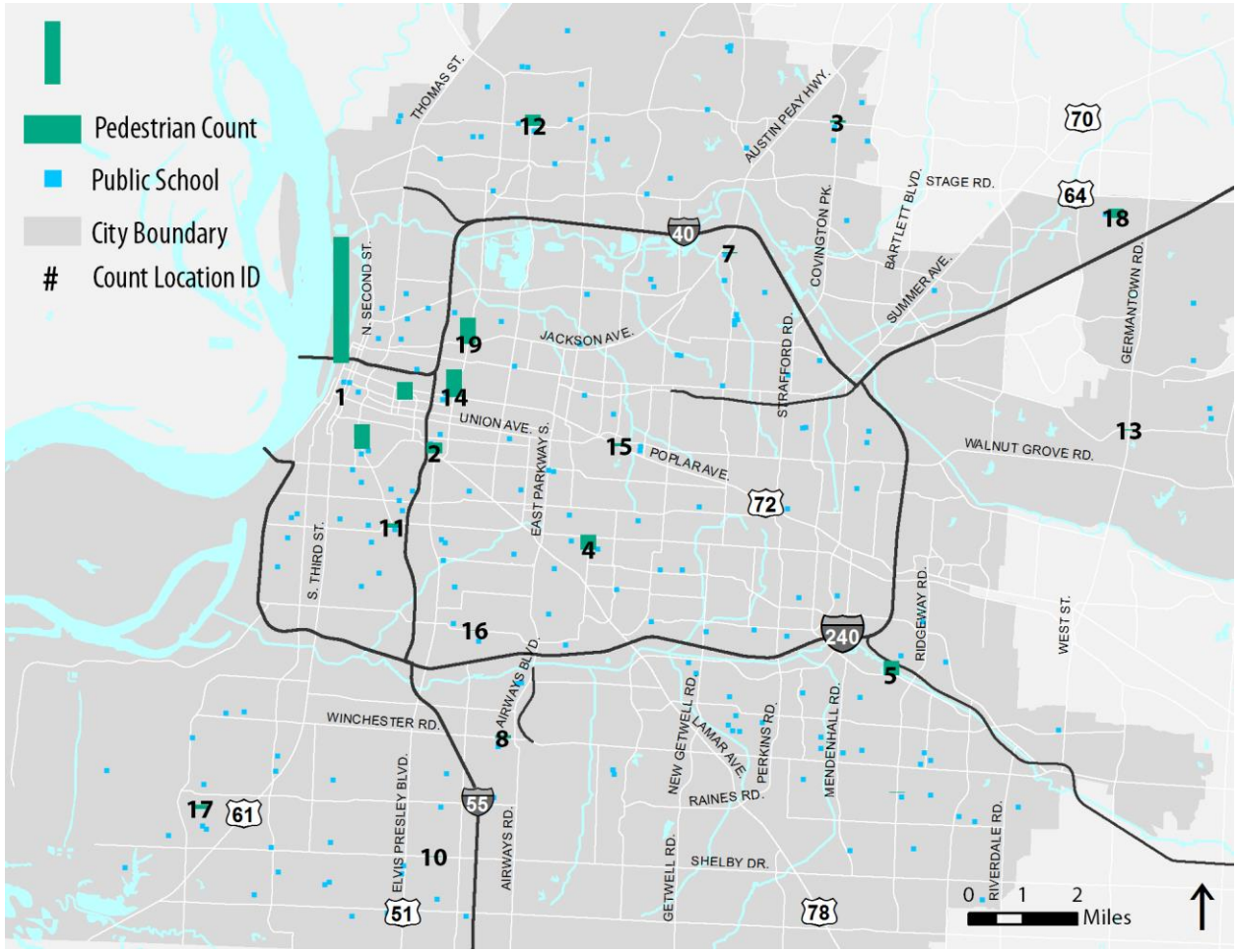
Table 3 through Table 6 below identify the top locations in terms of a) overall pedestrian volumes, b) share of youth pedestrians c) locations where pedestrians were most likely to cross near but away from the designated crossing, and d) locations where pedestrians were most likely to cross at the designated crossing. Note that locations with less than 10 pedestrians are excluded from these tables due to small sample size.

The **highest pedestrian crossing volumes** were observed downtown, along major commercial corridors, at a location near several schools, and in the medical district.

Table 3 - Count locations with the highest pedestrian crossing volumes (including both at and near the crossing)

Location	ID	Total Pedestrians	% Crossing Away from Designated Crossing	% of Youth Pedestrians	Notes
Union Ave. and Second Street	1	**1,066**	27%	1%	Signalized intersection downtown with crosswalks on all legs
Poplar Ave. and Cleveland	14	**233**	52%	3%	Signalized intersection on commercial corridor with crosswalks on all legs (faded, barely visible)
Jackson and Watkins	19	**227**	60%	5%	Signalized intersection in commercial area with crosswalks across Jackson Ave (2)
Georgia Ave and Lauderdale Ave	20	**209**	68%	31%	Signalized intersection near 3 schools (Booker T Washington High School, Larose Elementary School, and Martin Luther King Headstart) with crosswalks across Georgia Ave (2), Mississippi Blvd (N side), S Lauderdale St (N Side)
Jefferson Midblock at Hospital	9	**152**	66%	1%	Midblock crossing in medical district with high visibility crosswalk across Jefferson Ave

Figure 2: Count Results by Number of Pedestrians Observed



The **highest percentage of youth pedestrians** were all found at count locations located near schools.

Table 4 - Count locations with the highest percentage of youth pedestrians

Location	ID	Total Pedestrians	% Crossing Away from Designated Crossing	% of Youth Pedestrians	Notes
Western Park and Westmont	17	39	NA	**100%**	Near Westwood Park entrance, Westwood Elementary School, Chickasaw Middle School
S. Parkway and Mississippi	11	35	29%	**53%**	Near Circles of Success Learning Academy (Public Charter School), South Memphis Farmer's Market
Winchester and Boeingshire	8	26	39%	**46%**	Near Winchester Elementary School
Kate Bond and Deerfield Trace	18	84	26%	**42%**	Near Kate Bond Elementary School, Kate Bond Middle School
Frayser & Overton	12	92	78%	**36%**	Near Memphis Business Academy (Public Charter School) Denver Elementary School, commercial

Many pedestrians in Memphis can be observed choosing to cross near, but not at designated crossing facilities. Table 5, Table 6, and Figure 3 illustrate the count locations where pedestrians were the least and most likely to cross at the designated crossing.

- The locations with the highest percentage of pedestrians crossing **near but not at the designated crossing** are all locations with higher pedestrian count volumes. These include four signalized intersections (all involve two roadways of 4 lanes or greater) and a high visibility crosswalk across a four lane road. The intersections of two major streets can be intimidating for pedestrians who may face conflicts with right and left turning vehicles. Additional treatments such as a protected left turn phase, leading pedestrian intervals, a longer pedestrian walk phase, and more frequent crosswalk maintenance could increase the share of pedestrians choosing to cross these roads at the signalized intersection. Enhancing the crosswalk on Jefferson Avenue with a median refuge island or a flashing beacon could increase the percentage of pedestrians making use of this crossing facility.
- The locations with the highest percentage of pedestrians using the designated crossing tend to have lower crossing volumes, so there is an element of uncertainty regarding how well these percentages reflect the true averages.

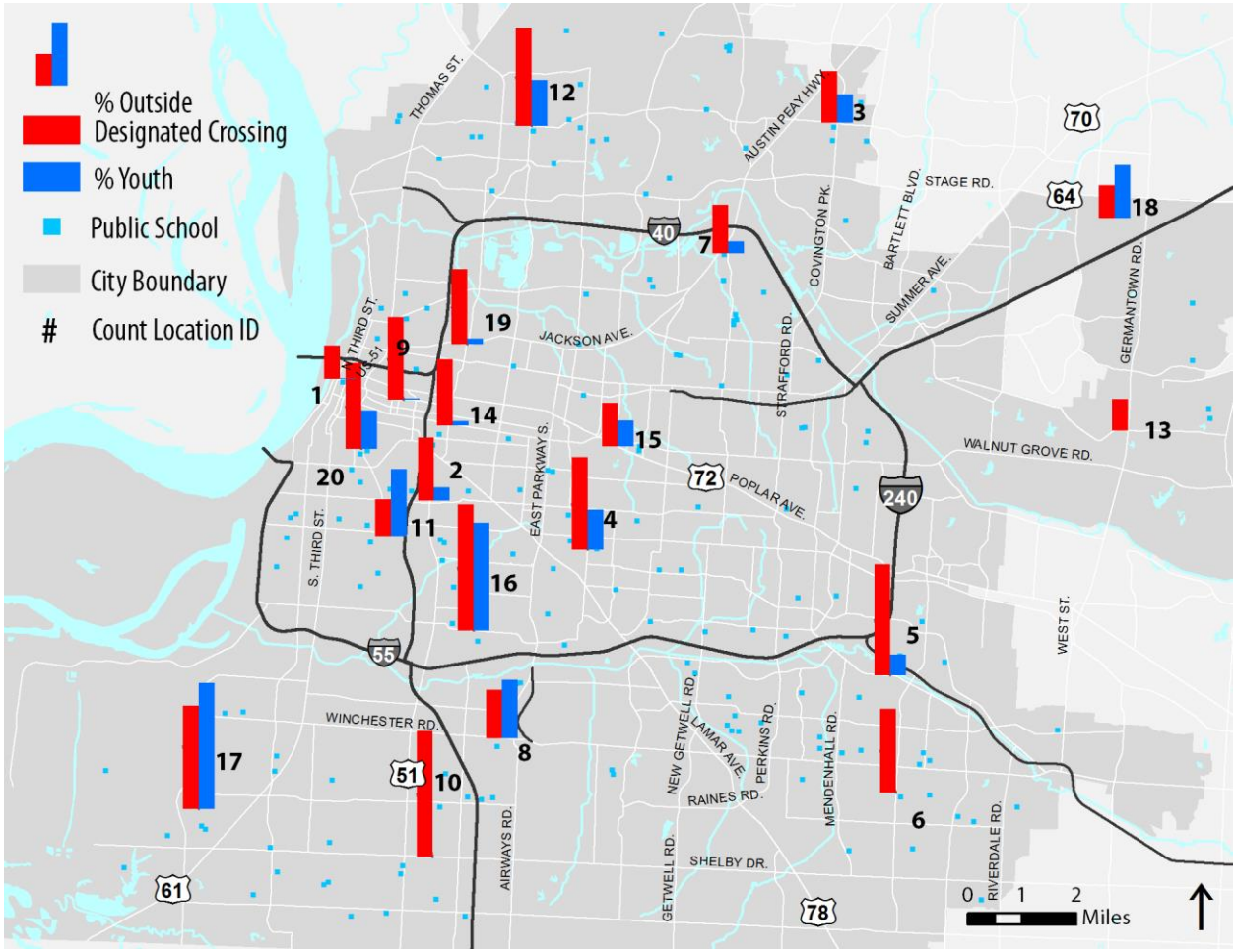
Table 5 – Count locations with the highest percentage of pedestrians crossing at locations near but not at the designated crossing

Location	ID	Total Pedestrians	% Crossing Away from Designated Crossing	% of Youth Pedestrians	Notes
Frayser & Overton	12	96	**78%**	36%	Signalized intersection of two 5 lane roads, with crosswalks on all legs
Georgia Ave and Lauderdale Ave	20	209	**68%**	31%	Signalized intersection of a 4 lane and 2 lane road, with crosswalks across Georgia Ave (2), Mississippi Blvd (N side), S Lauderdale St (N Side)
Jefferson Midblock at Hospital	9	152	**66%**	1%	High visibility crosswalk across a 4 lane road (Jefferson Ave)
Jackson and Watkins	19	227	**60%**	5%	Signalized intersection of a 4 lane and 6 lane road, with crosswalks across Jackson Ave (2)
Poplar Ave. and Cleveland	14	233	**52%**	3%	Signalized intersection of a 7 lane and 4 lane road, with crosswalks on all legs (faded, barely visible)

Table 6 - Count locations with the lowest percentage of pedestrians crossing away from intersections include:

Location	ID	Total Pedestrians	% Crossing Away from Designated Crossing	% of Youth Pedestrians	Notes
Kate Bond and Deerfield Trace	18	84	**26%**	42%	High visibility crosswalk across two 2 lane roads, with crosswalks across Kate Bond Rd (N side, Continental), Deerfield Trace (2)
Union Ave. and Second Street	1	1,066	**27%**	1%	Signalized intersection of a 5 lane and 3 lane road downtown with crosswalks on all legs
S. Parkway and Mississippi	11	35	**29%**	53%	Signalized intersection of 5 lane and 3 lane road with crosswalks on all legs (faded)
Winchester and Boeingshire	8	26	**39%**	46%	Unsignalized crossing of a 7 lane and a 2 lane road, with crosswalks across Winchester Rd (W side) and Boeingshire Dr (S side)
Wales and Graham	7	13	**39%**	10%	Unsignalized crossing of a 2 lane road with crosswalk across Graham St (S side, faded)

Figure 3: Count Results by Percentage of Youth Pedestrians and Percentage of Pedestrians Crossing outside a Designated Crossing



Appendix A – Considerations for Future Counts

The Memphis Urban Area Metropolitan Planning Organization (Memphis MPO) has recently initiated a bicycle and pedestrian count program which is conducted annually at 40 locations each April, a good weather month in Memphis. The selected count locations are sites where the MPO has either recently funded projects or has projects under design.

The 20 locations identified in this memo for the City of Memphis should also be counted annually to track changes in activity and pedestrian behaviors (e.g., use of marked crossing facilities). These weekday counts should continue to be performed during the annual NPBD count period in September for consistency.

The citywide count program established here is intended to tally the number of pedestrians at key locations around the city (while the current plan focuses on schools, other locations may include downtown, employment centers, and on trails); **the same locations should be counted in the same manner annually.**

Considerations for future count locations:

- If resources allow, the program could be expanded to include both a weekday and weekend[2] count at each location during the national count week. The program could also be expanded to count up to four times per year to track seasonal and other variations (optional quarterly count dates are provided on the NBPD website)**.**
- **If major on-street or off-street infrastructure projects are planned**, baseline and post-construction user counts can be performed through this coordinated annual count process for maximum efficiency.
- Similarly, if land use developments are occurring that impact a specific user group, **pre- and post-construction counts** can be performed to track more refined information about the growth of walking activity. Examples could be new student housing within walking distance of campus or new multi-family housing near transit stops.
- **Future iterations of the annual count program could include user surveys**. Surveys allow an agency to learn more detailed user information such as demographics, trip origin/destinations, trip purpose, and perceived benefits of bicycling and walking. The NBPD website includes survey instructions, forms, and participant training materials: http://bikepeddocumentation.org. It is not necessary to survey pedestrians every year. To optimize resources, surveys can be performed every 3-5 years to track changes in pedestrian perceptions and trip types over time.
- **Over time, the city and partners could invest in permanent and mobile automated counters** and integrate pedestrian counts into regularly scheduled and on-going traffic count programs and required traffic impact analysis studies so that data on pedestrian usage are a regular part of transportation data collection for the City. Even as automated counters are used in the future at select locations, manual counts can continue to provide data at a wider number of locations.

[2] The recommended national weekend count period is a Saturday from 12-2PM.

Appendix B – 2014 Pedestrian Count Results

Table 7: Summary of Pedestrian Count Results

Location	ID	Total Pedestrians	% Crossing Away from Designated Crossing	% of Youth Pedestrians	Crossing Type	Crossing Context	Pedestrian Infrastructure
Union Ave. and Second Street	1	1066	26.6%	0.6%	Signalized Intersection	Downtown	Crosswalks on all legs
Bellevue and Lamar	2	90	50.0%	10.6%	Signalized Intersection	Commercial Corridor	Crosswalks on all legs (faded)
Covington Pike and Yale	3	22	40.9%	22.5%	Signalized Intersection	Near school/commercial	Crosswalks on all legs (faded), median on Yale St on W side of intersection (no refuge)
Deadrick and Pendelton	4	129	73.6%	32.1%	Unsignalized Intersection	Near school/neighborhood	Crosswalk across Pendleton St (N side) and Deadrick Ave (E side, faded)
Mt. Moriah and Pickening	5	124	87.9%	16.8%	Unsignalized Intersection	Residential/Industrial	No infrastructure
Ridgeway Blvd and Hickory Hill Rd	6	6	66.7%	0.0%	Signalized Intersection	Near School	Crosswalk across Hickory Hill Rd (N side)
Wales and Graham	7	13	38.5%	9.5%	Unsignalized Intersection	Near School	Crosswalk across Graham St (S side, faded)
Winchester and Boeingshire	8	26	38.5%	46.2%	Unsignalized Intersection	Near School	Crosswalk across Winchester Rd (W side) and Boeingshire Dr (S side)
Jefferson Midblock at Hospital	9	152	65.8%	1.1%	Midblock	Medical District	High visibility crosswalk across Jefferson Ave
Woodbridge and Southland	10	2	100.0%	0.0%	Midblock	Near private school and mall	High visibility crosswalk across Shelby Dr (ladder) with median refuge
S. Parkway and Mississippi	11	35	28.6%	52.8%	Signalized Intersection	Near school, farmer's market	Crosswalks on all legs (faded)
Frayser & Overton	12	96	78.1%	36.3%	Signalized Intersection	Near schools, commercial	Crosswalks on all legs
Germantown Pky and Trinity	13	8	25.0%	0.0%	Signalized Intersection	Commercial Corridor	Crosswalks on all legs, slip lane with pedestrian refuge on southwest corner, medians on all

							approaches (no other refuges)
Poplar Ave. and Cleveland	14	233	52.4%	3.4%	Signalized Intersection	Commercial Corridor	Crosswalks on all legs (faded, barely visible)
Poplar Ave. and Library Entrance	15	26	34.6%	20.5%	Midblock	Library (Counter to stand in front of library entrance)	No infrastructure
Ball St. and Manchester Rd.	16	7	100.0%	85.7%	Unsignalized Intersection		No infrastructure
Western Park and Westmont	17	39	82.1%	100.0%	Unsignalized Intersection	Near park entrance, schools	No infrastructure
Kate Bond and Deerfield Trace	18	84	26.2%	42.0%	Unsignalized Intersection	Near school	High visibility crosswalk across Kate Bond Rd (N side, Continental), Crosswalks across Deerfield Trace (2)
Jackson and Watkins	19	227	59.5%	4.6%	Signalized Intersection	Commercial area	Crosswalks across Jackson Ave (2)
Georgia Ave and Lauderdale Ave	20	209	67.9%	30.6%	Signalized Intersection	Near 3 schools	Crosswalks across Georgia Ave (2), Mississippi Blvd (N side), S Lauderdale St (N Side)

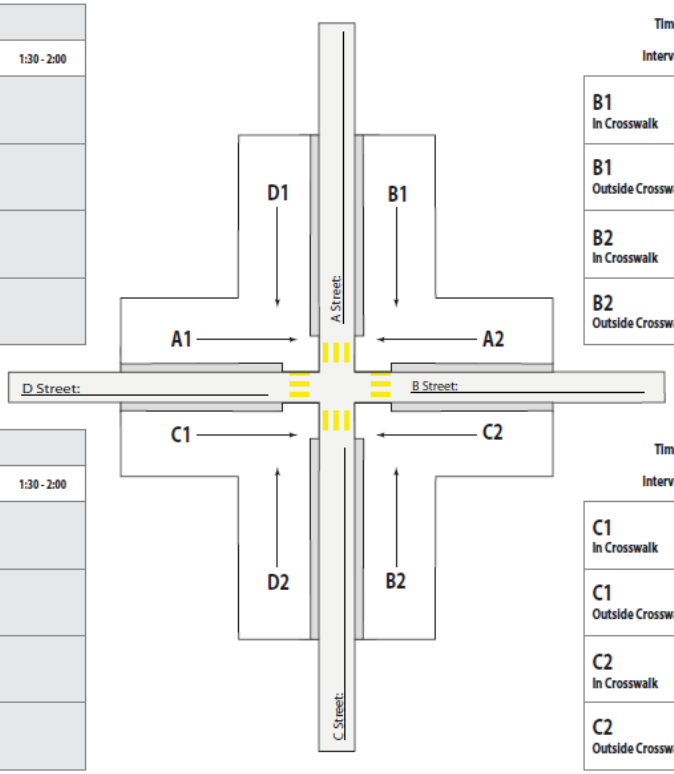
Table 8: Count Location Dates, Times, and Weather Notes

Location	ID	Date	Time	Weather Notes (°F)
Union Ave. and Second Street	1	9/17/2014	5-7PM	74° Overcast
Bellevue and Lamar	2	9/23/2014	5-7PM	80° Sunny
Covington Pike and Yale	3	9/17/2014	5-7PM	74° Overcast
Deadrick and Pendelton	4	9/9/2014	5-7PM	92° Sunny
Mt. Moriah and Pickening	5	9/18/2014	5-7PM	79° Partly Cloudy
Ridgeway Blvd and Hickory Hill Rd	6	9/9/2014	5-7PM	92° Sunny
Wales and Graham	7	9/16/2014	5-7PM	76° Partly Cloudy
Winchester and Boeingshire	8	9/9/2014	5-7PM	93° Partly Cloudy
Jefferson Midblock at Hospital	9	9/18/2014	5-7PM	80° Partly Cloudy
Woodbridge and Southland	10	9/9/2014	5-7PM	92° Sunny
S. Parkway and Mississippi	11	9/16/2014	5-7PM	76° Partly Cloudy
Frayser & Overton	12	9/10/2014	5-7PM	93° Partly Cloudy
Germantown Pky and Trinity	13	9/9/2014	5-7PM	92° Sunny
Poplar Ave. and Cleveland	14	9/18/2014	5-7PM	79° Partly Cloudy
Poplar Ave. and Library Entrance	15	9/9/2014	5-7PM	92° Sunny
Ball St. and Manchester Rd.	16	9/18/2014	5-7PM	77° Partly Cloudy
Western Park and Westmont	17	9/10/2014	5-7PM	93° Partly Cloudy
Kate Bond and Deerfield Trace	18	9/18/2014	5-7PM	79° Partly Cloudy
Jackson and Watkins	19	9/18/2014	5-7PM	80° Partly Cloudy
Georgia Ave and Lauderdale Ave	20	9/9/2014	5-7PM	95° Sunny

Appendix C – Pedestrian Count Form

Time:				
Interval:	0:0 - 0:30	0:30 - 1:00	1:00 - 1:30	1:30 - 2:00
A1 In Crosswalk				
A1 Outside Crosswalk				
A2 In Crosswalk				
A2 Outside Crosswalk				

Time:				
Interval:	0:0 - 0:30	0:30 - 1:00	1:00 - 1:30	1:30 - 2:00
B1 In Crosswalk				
B1 Outside Crosswalk				
B2 In Crosswalk				
B2 Outside Crosswalk				



Time:				
Interval:	0:0 - 0:30	0:30 - 1:00	1:00 - 1:30	1:30 - 2:00
D1 In Crosswalk				
D1 Outside Crosswalk				
D2 In Crosswalk				
D2 Outside Crosswalk				

Time:				
Interval:	0:0 - 0:30	0:30 - 1:00	1:00 - 1:30	1:30 - 2:00
C1 In Crosswalk				
C1 Outside Crosswalk				
C2 In Crosswalk				
C2 Outside Crosswalk				

DATE: _____
TIME: _____
LOCATION: _____
_____
_____
WEATHER: _____
_____
_____

OTHER PEDESTRIANS TALLY
Those who travel through the intersection but do not cross a street

PUSH BUTTON USE TALLY
Track use of pedestrian push buttons

YOUTH TALLY
Under Age 18, all movements

OTHER NOTES
Note faded crosswalks, conflicts between pedestrians and vehicles, and other behaviors or infrastructure issues.