

## CITY OF PITTSBURGH

**TO:** Pat Hassett  
Assistant Director

**DEPARTMENT:** Department of Public Works/  
Bureau of Engineering and  
Construction

**FROM:** Amanda Broadwater  
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**DEPARTMENT:** Department of Public Works/  
Bureau of Engineering and  
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**SUBJECT:** Mid-Block Crosswalk Warrants for the City of Pittsburgh

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This memo is intended to be a guide for determining when a mid-block crosswalk may be warranted and when an engineering study is may be submitted for consideration. This document is also provided to recommend the minimum information that shall be provided in the engineering study. However, additional information may be requested by the City due to site specific conditions

### Introduction

Within any urban area, pedestrian mobility along and across streets often conflicts with vehicular traffic on the street. This is especially true in highly developed sections of a city. Accommodating pedestrian mobility while controlling the flow of traffic is particularly challenging given safety concerns. The typical point of crossing for pedestrians is at an intersection where traffic signals and stop signs can be used to allocate time for the pedestrians to safely cross the street. In some instances, however, there is a need (or desire) for pedestrians to cross at a "mid-block" location away from an intersection. Because pedestrians and related traffic control devices are not typically expected at mid-block locations, the placement and design of such crossings require careful consideration of traffic control measures to ensure their appropriateness and safe configuration. Where appropriate, the safety of both pedestrians and motorists must be paramount in the design of mid-block crossings, trumping any concerns for motorist and pedestrian convenience.

### Policy

Mid-block pedestrian crossing shall only be considered where the pedestrian desire line cannot be reasonably accommodated at a nearby intersection and the crossing can be designed as a safe and accessible crossing in accordance to prevailing engineering standards. Within in the City of Pittsburgh, overuse of mid-block crosswalks should be avoided to maximize the effectiveness of the mid-block crosswalks that are warranted. The use of mid-block crosswalks

is greatly discouraged, but the City understands that they are necessary in certain instances, and only where they are necessary, shall they be implemented.

### Engineering Considerations

There are several sources of engineering guidance for evaluating the appropriateness of mid-block crosswalks and for designing mid-block crossings that are safe for all modes of the traveling public including vehicles, pedestrians, cyclists, and transit. Information presented here has been taken from these sources listed at the end of the memo.

The Federal Highway Administration's Manual of Uniform Traffic Control Devices (MUTCD) provides general guidance on the location of crosswalks. From the MUTCD:

“ Marked crosswalks...should be provided at...appropriate points of pedestrian concentration, such as at loading islands, mid-block pedestrian crossings, or where pedestrians could not otherwise recognize the proper place to cross.

Crosswalk lines should not be used indiscriminately. An engineering study should be performed before they are installed at locations away from highway traffic signals or STOP signs.”

However, the MUTCD does not provide specific guidance relative to site conditions such as traffic volume, pedestrian volume, number of lanes, presence or type of median for where marked crosswalks should or should not be used at uncontrolled locations.

According to prevailing standards and guidelines, mid-block crosswalks should be considered only when the following criteria are met:

1. ***ADT volumes are between 2,500 and 12,000 vehicles per day (vpd).*** A recent FHWA study found that marked crosswalks at mid-block locations on streets with ADTs under 12,000 and speeds less than 40 mph had no effect (either positive or negative) on crash rates, but as traffic volumes rose, the frequency and severity of accidents increased. In addition, it has been found that on lower volume streets (under 2,500 vehicles per day) pedestrians are less likely to utilize mid-block crosswalks because an abundance of gaps are available within the traffic stream to allow pedestrians to cross safely. Conversely, streets with ADT of 12,000 vpd or greater do not have gaps long enough for a pedestrian to safely cross the street. The maximum threshold shall be decreased to 9,000 vehicles per day on multi-lane streets if a pedestrian refuge (raised median) is not available. (4,5,6)
2. ***The minimum pedestrian crossing volume is 25 pedestrians per hour for at least four hours of a typical day.*** Frequent pedestrian traffic at a crosswalk location creates expectations for motorists. Infrequent use of a mid-block crosswalk may increase the likelihood of a pedestrian/vehicle accident because a pedestrian crossing violates motorists' expectations while pedestrian expect motorists to yield the right of way. (4)

3. *The posted speed (or 85<sup>th</sup> percentile speed) is less than 40 mph.(4)*
4. *An intersection or uncontrolled crossing is not located within 300 feet of the proposed uncontrolled mid-block crossing. (4)*
5. *A driveway or minor intersection is not located within 100 feet of the proposed mid-block crossing. (4)*
6. *An alternative route is not available for the crossing.*
7. *Adequate sight distance can be provided.* Crosswalk locations must allow motorists to safely yield for pedestrians. Sight distance shall be provided based on current design standards. Parking spaces and roadside features must be included in the sight distance analysis. (4)
8. *The proposed location is not immediately downstream of a bus stop.*
9. *The crossing volume is not caused by a gap in the sidewalk network that can be corrected.*
10. *The proposed mid-block crosswalk will connect to sidewalks on both sides of the street.*
11. *ADA requirements can be met at both ends of the crosswalk.*

For a mid-block crossing to be warranted and safely be designed, the above criteria must be met. However, mid-block crosswalks may also be considered if any of the following criteria are:

1. *The location is an approved school crossing.*
2. *A traffic engineering study indicates a safety issue that can be corrected with a mid-block crosswalk.*
3. *The crosswalk location is part of an approved master plan development that will be implemented in stages.* (The above criteria would be required for the build-out scenario.)

### **Engineering Study**

Given the primacy of pedestrian safety in mid-block crossings, an engineering study may be required to ensure the crossing is warranted and can be designed per prevailing engineering standards for a safe and accessible crossing. As a minimum, the engineering study should provide the following information:

1. Name and classification of the street to be crossed
2. Warrant Analysis
3. Traffic volumes and percentage of heavy vehicles
4. Posted speed and/or 85<sup>th</sup> percentile speed

5. Pedestrian volume and speed
6. Location of pedestrian crossing origin and crossing destination
7. Existing sidewalk and sidewalk ramp locations
8. Sidewalk width
9. Sight distance and obstructions
10. Grades, horizontal curvature, pavement width and the number and type of lanes
11. Location of nearby driveways and intersections
12. Location of on-street parking
13. Location of street lighting
14. Location of drainage structures
15. Distance to the nearest intersection or marked crosswalk in both directions
16. Potential for accidents
17. Bus stop locations

The Municipal Traffic Engineer shall determine when and where an engineering study is required to support a mid-block crossing proposal. Consideration will be based on classification of the street, context/character of the street, and the nature of the pedestrian demand. Application and approval of a mid-block crosswalk shall require submission to the Municipal Traffic Engineer for review and comment.

If a mid-block crosswalk is determined appropriate for the location, it shall be designed and constructed per applicable standards and shall be approved by the City of Pittsburgh's Municipal Traffic Engineer. The design shall meet all current design standards and shall be ADA accessible. At all mid-block crosswalks, high visibility transverse crosswalk markings and pedestrian crossing warning signs (W2-11) shall be installed. On multilane streets, yield lines with "Yield here to Pedestrians" signs (R1-5a) shall be installed. Dependant on traffic and pedestrian volumes as well as visibility conditions, additional traffic control devices may be required. The approved design of a mid-block crosswalk shall be responsive to any comments and recommendations provided by the Municipal Traffic Engineer.

cc: Guy Costa, DPW / Sidney Kaikai, DCP / John Doherty, Law / File

## References:

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2. U.S. Department of Transportation Federal Highway Administration. Safety Effects of Marked Versus Unmarked Crosswalks at Uncontrolled Locations: Final Report and Recommended Guidelines, 2005, <http://www.tfhrc.gov/safety/pubs/04100/04100.pdf>
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4. Institute of Transportation Engineers. Context Sensitive Solutions in Designing Major Urban Thoroughfares for Walkable Communities, 2006, <http://www.ite.org/bookstore/RP036.pdf>
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6. City of Columbia, Missouri. Policy and Standards for Pedestrian Crossings, 2000.
7. City of Palo Alto, California. Mid-Block Crosswalk Guidelines, 2000
8. Colorado Department of Transportation. Marked Crosswalk, (Brochure)
9. Virginia Department of Transportation, Traffic Engineering Division. Guidelines for the Installation of Marked Crosswalks.