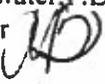


**CITY OF PITTSBURGH**

**TO:** Pat Hassett  
Assistant Director

**DEPARTMENT:** Department of Public Works/ Bureau of  
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**FROM:** Amanda Broadwater, P.E.  
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**DEPARTMENT:** Department of Public Works/ Bureau of  
Engineering and  
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**DATE:** January 3, 2008

**SUBJECT: MULTI-WAY STOP SIGN WARRANTS FOR THE CITY OF PITTSBURGH**

This memo is intended to be a guide for determining when multi-way stop signs can be implemented based on sound engineering warrants.

**Introduction**

A multi-way stop sign can be an effective tool to help assist motorists, cyclists, and pedestrians in determining who has the right of way at an intersection. A multi-way stop sign is generally seen at an intersection of two streets that have nearly the same traffic volume or at an intersection where the normal right of way rule is violated, or where intersection geometry dictates a need for a stop condition such as an extreme grade, or site line obstructions.

A multi-way stop sign is not a traffic calming device. Studies have shown that unwarranted stop signs are more likely to be disregarded by traffic; therefore, increasing the likelihood of accidents at the intersection. Many times, multi-way stops are requested to reduce speeding. However, before-and-after studies have not shown a decrease in vehicular speed due to the implementation of a multi-way stop, rather increases in mid-block speed have been observed. Additional issues result from installing unwarranted multi-way stops such as increased traffic noise, pollution, additional delay, disregard for traffic control devices, and traffic enforcement.

**Policy**

Multi-way stop control will be implemented at intersections only when warranted by current engineering standards and supported by an engineering assessment of intersection conditions.

## **Engineering Considerations**

Within the City of Pittsburgh, two sources of engineering guidance are acceptable for evaluating the appropriateness of multi-way stops. These sources and applicable sections are listed below.

The first source is The Manual of Uniform Traffic Control Devices (MUTCD). It provides the following guidance for the location of stop signs, and multi-way stops signs.

### **Section 2B.05 STOP Sign Applications**

#### **Guidance:**

STOP signs should be used if engineering judgment indicates that one or more of the following conditions exist:

- A. Intersection of a less important road with a main road where application of the normal right-of-way rule would not be expected to provide reasonable compliance with the law;
- B. Street entering a through highway or street;
- C. Unsignalized intersection in a signalized area; and/or
- D. High speeds, restricted view, or crash records indicate a need for control by the STOP sign.

#### **Standard:**

Because the potential for conflicting commands could create driver confusion, STOP signs shall not be installed at intersections where traffic control signals are installed and operating except:

- A. If the signal indication for an approach is a flashing red at all times; or
- B. If a minor street or driveway is located within or adjacent to the area controlled by the traffic control signal, but does not require separate traffic signal control because an extremely low potential for conflict exists.

Portable or part-time STOP signs shall not be used except for emergency and temporary traffic control zone purposes.

#### **Guidance:**

STOP signs should not be used for speed control. (High speeds warrant stop controls as specified in the minimum volume warrant 3.)

STOP signs should be installed in a manner that minimizes the numbers of vehicles having to stop. At intersections where a full stop is not necessary at all times, consideration should be given to using less restrictive measures such as YIELD signs.

### **Section 2B.07 Multiway Stop Applications**

#### **Support:**

Multiway stop control can be useful as a safety measure at intersections if certain traffic conditions exist. Safety concerns associated with multiway stops include pedestrians, bicyclists, and instances where all road users expect other road users to stop. Multiway stop control is used where the volume of traffic on the intersecting roads is approximately equal.

The restrictions on the use of STOP signs described above also apply to multiway stop applications.

Guidance:

The decision to install multiway stop control should be based on an engineering study. The following criteria should be considered in the engineering study for a multiway STOP sign installation:

A. Where traffic control signals are justified, the multiway stop is an interim measure that can be installed quickly to control traffic while arrangements are being made for the installation of the traffic control signal.

B. A crash problem, as indicated by 5 or more reported crashes in a 12-month period that are susceptible to correction by a multiway stop installation. Such crashes include right- and left-turn collisions as well as right-angle collisions.

C. Minimum volumes:

1. The vehicular volume entering the intersection from the major street approaches (total of both approaches) averages at least 300 vehicles per hour for any 8 hours of an average day, and

2. The combined vehicular, pedestrian, and bicycle volume entering the intersection from the minor street approaches (total of both approaches) averages at least 200 units per hour for the same 8 hours, with an average delay to minor-street vehicular traffic of at least 30 seconds per vehicle during the highest hour, but

3. If the 85th-percentile approach speed of the major-street traffic exceeds 65 km/h or exceeds 40 mph, the minimum vehicular volume warrants are 70 percent of the above values.

D. Where no single criterion is satisfied, but where Criteria B, C.1, and C.2 are all satisfied to 80 percent of the minimum values. Criterion C.3 is excluded from this condition.

Option:

Other criteria that may be considered in an engineering study include:

A. The need to control left-turn conflicts;

B. The need to control vehicle/pedestrian conflicts near locations that generate high pedestrian volumes;

C. Locations where a road user, after stopping, cannot see conflicting traffic and is not able to reasonably safely negotiate the intersection unless conflicting cross traffic is also required to stop; and

D. An intersection of two residential neighborhood collector (through) streets of similar design and operating characteristics where multiway stop control would improve traffic operational characteristics of the intersection.

In addition to the MUTCD, the Pennsylvania Code dictates additional warrants for multi-way stop sign applications. From Title 67 Chapter 212 of the Pennsylvania Code:

(c) *Multiway stop applications.* In addition to the criteria and options warranting multiway stop applications in the MUTCD, the following apply:

(1) The five or more reported crashes in a 12-month period for Warrant B may include both reportable crashes, and nonreportable crashes that are documented in the police files that occurred during a 12-month period during the most recent 3 years of available crash data.

(2) Multiway stop applications may not be used because of limited available corner sight distance unless there is no practical method of improving the sight distance or reducing the speed limit to satisfy the minimum corner sight distance values.

The City of Pittsburgh is dedicated to providing a safe and efficient traffic network. In doing so, if a multi-way stop is requested, an engineering assessment will be conducted to determine the appropriateness of fulfilling the request. The Municipal Traffic Engineer shall determine when and where an engineering study is required to support a multi-way stop proposal. If a multi-way stop is determined appropriate for the location, it shall be designed and implemented per the applicable standards and shall be approved by the City of Pittsburgh.

AB:cd

cc: Guy Costa

References:

1. U.S. Department of Transportation Federal Highway Administration. The Manual of Uniform Traffic Control Devices for Highway and Streets 2003 Edition including Revision 1 dated November 2004, <http://mutcd.fhwa.dot.gov/pdfs/2003r1/pdf-index.htm>
2. Commonwealth of Pennsylvania Department of Transportation Bureau of Highway Safety and Traffic Engineering. Official Traffic Control Devices Publication 212, 2005.
3. Martin Bretherton Jr., P.E.(M), Multi-Way Stops – The Research Shows the MUTCD is correct!, <http://www.ite.org/traffic/documents/AHA99B49.pdf>
4. Institute of Transportation Engineers. 4 Issue Briefs Stop Signs, April 2004.