

## MULTIWAY STOP CONTROL

Multiway stop control can be an effective way to improve safety at problem intersections, such as those with sight distance issues that cannot be remedied; significant conflicts with pedestrians, bicyclists, and vehicles; and a history of right-angle crashes. Multiway stop control can also be effective when the traffic volumes of the intersecting roads are near equal.

However, multiway stop control should not be misused. While residents may request stop signs to slow vehicular traffic, multiuse of them at an intersection is ineffective at controlling speeds. They can lead to driver disrespect and ignoring of warranted stop signs, and they may create a different enforcement issue of failing to stop at stops signs.

### Multiway Stop Control Study

Per Section 6109(e) of Title 75 (Pennsylvania Vehicle Code), the decision to install multiway stop control must be based on an engineering and traffic study. According to Section 212.4(b) of Publication 212, these studies can be performed by police officers, roadmasters, maintenance supervisors, or traffic technicians except as noted in Sections 212.109 and 212.117 relating to bridge speed limits and weight, size, and load restrictions.

Knowledge of the local road system will quickly identify problem and crash areas that may be improved with proper use of multiway stop control. As described in the warrants, vehicular volume counts, intersection corner sight distance measurements, crash data analysis, and possibly vehicle delay estimates are required to properly evaluate the need for multiway stop control. Additionally, a review of intersection geometry, adjacent roadway features, and vehicle speeds through the area can further inform the decision.

PennDOT traffic study form TE-102, Multi-way Stop Control at Intersections, can be used to document the study: [www.dot.state.pa.us/portal%20information/traffic%20signal%20portal/TE.html](http://www.dot.state.pa.us/portal%20information/traffic%20signal%20portal/TE.html)

TE-102 (8-09)

### MULTIWAY STOP CONTROL AT INTERSECTIONS ENGINEERING AND TRAFFIC STUDY

PLEASE TYPE OR PRINT ALL INFORMATION IN BLUE OR BLACK INK



A - LOCATION INFORMATION		
COUNTY		MUNICIPALITY
MAJOR STREET INFORMATION		
SR#	TR#	STREET NAME
STATION		LOCATION
MINOR STREET INFORMATION		
SR#	TR#	STREET NAME
STATION		LOCATION



### Multiway Stop Warrants

Section 2B.07 of the *Manual on Uniform Traffic Control Devices (MUTCD)* contains warrants for multiway stop control applications. These warrants are supplemented by additional Pennsylvania-specific criteria in Section 212.106(c) of Title 67 (PennDOT Publication 212). A warrant is a guideline, rather than absolute criteria, to determine whether a sign should be installed. The use of a warrant, tempered with professional judgment and local knowledge, will result in effective implementation of multiway stop control.

The following criteria should be considered in the engineering and traffic study for determining use of a multiway stop control:

- A) As an interim measure that can be installed quickly to control traffic while arrangements are being made for a traffic control signal.
- B) To correct a crash problem, as indicated by five or more reported crashes in a 12-month period, including right-turn, left-turn, and right-angle crashes.
- C) At intersections with the following 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 eight 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 eight 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 40 mph, the minimum vehicular volume warrants are 70 percent of the values provided in Items 1 and 2.
- 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.

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

- The need to control left-turn conflicts;
  - The need to control vehicle/pedestrian conflicts near locations that generate high pedestrian volumes;
  - Locations where a road user, after stopping, cannot see conflicting traffic and is not able to negotiate the intersection unless conflicting cross traffic is also required to stop; and
  - 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, Publication 212 provides criteria for multiway stop applications:
- Under Section 212.106(c)(1), the five or more reported crashes in a 12-month period for Warrant B may include both reportable and nonreportable crashes that are documented in police files and that occurred in a 12-month period during the most recent three years of available crash data.
  - Under Section 212.106(c)(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.

### Improper Use of Multiway STOP Signs

Unfortunately, multiway stop control is sometimes installed to control speed on local streets. Section 2B.04 of the MUTCD clearly states that STOP signs should not be used for speed control. However, many people believe that forcing motorists to stop at each intersection will decrease overall speed on the road even though studies show that STOP signs only reduce speed immediately adjacent to the sign. Many drivers will accelerate between intersections to make up for time lost at the STOP sign.

Engineering studies also indicate that the unwarranted installation of multiway STOP signs may cause additional problems, such as rear-end collisions, a redistribution of traffic onto side streets, wasted fuel, traffic noise, automobile pollution, cost of enforcement, and drivers ignoring the unwarranted STOP signs. If speeding is a concern, municipalities can collect data to document the problems and employ other methods, such as enforcement, speed awareness trailers, or traffic calming measures, to address the problem.

### Ordinances

Section 6109(b) of Title 75 indicates that multiway stop control requires an ordinance. After an engineering and traffic study has been conducted to collect data on existing conditions and compared to warrants for multiway stop control, municipalities should document all findings and results and work with their solicitor to craft or amend the appropriate ordinance.

### Signs for Multiway Stop Control

At intersections where all approaches are controlled by STOP signs, an ALL WAY supplemental plaque (R1-3P) must be mounted below each STOP sign, per Section 2B.05 of the MUTCD. Supplemental plaques with legends, such as 2-WAY, 3-WAY, 4-WAY, etc., are no longer approved and should not be used with STOP signs. PennDOT's Publication 236, *Handbook of Approved Signs*, also addresses the use of these required plaques.

For intersections where STOP signs control all but one approach to the intersection, plaques with the appropriate additional messages of TRAFFIC FROM LEFT (RIGHT) DOES NOT STOP (W4-4AP) or ONCOMING TRAFFIC DOES NOT STOP (W4-4BP) should be used unless the only

non-stopped approach is from a one-way street.

CROSS TRAFFIC DOES NOT STOP (W4-4P) signs may be used beneath a STOP sign when engineering judgment indicates that conditions are present that are causing or could cause motorists to misinterpret the intersection as an all-way stop. Refer to the MUTCD and PennDOT Publication 236 for specific guidance on these supplementary signs.

Section 2B.05 of the MUTCD and Section 212.107 of PennDOT Publication 212 provide specific guidance for justifying and placing the EXCEPT RIGHT TURN plaque (R1-10P). In general, the EXCEPT RIGHT TURN plaque is authorized for use below a STOP sign to allow right-turn movements to flow without stopping at an intersection when the major flow of traffic makes a right-hand turn rather than proceeding straight through.

Use of the EXCEPT RIGHT TURN plaque should be limited to those locations where significant energy savings can be realized by minimizing the number of vehicles required to stop or substantially reduce their speeds. When used, STOP signs are required on all other intersection approaches except for the approach with a corresponding left-turn movement. Care should be taken to ensure that no traffic conflicts exist. An engineering and traffic study is required for this sign.

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By taking the appropriate steps before installing multiway stop control, municipalities can ensure that the signs' use and location will help to improve safety and properly regulate traffic through an area. Improper signing and ignoring the warrants may create issues for road users and the responsible municipality.

