

Minimum Traffic Signal Warrants



City				Date		
Major Street		Minor Street		Speed Limit	Population	Analysis for Year

Peak 8 Hour Volume (Vehicles and/or Pedestrians per Hour)

Time (Use the same time for both streets)									
Major Street (Total vehicles from both approaches)									
Minor Street (Total vehicles from one direction)									
Pedestrian (Highest volume crossing the major street)									

Warrant	Description	Compliance	
		Yes	No
1 Eight-Hour Vehicular Volume	<p>One of the following conditions exists for each of any 8 hours of an average day:</p> <p>A. The VPH given in the 100% column of Table 1-A-1 and Table 1-A-2 exist, <u>or</u></p> <p>B. The VPH given in the 100% column of Table 1-B-1 and Table 1-B-2 exist.</p> <p>Volumes on the major street and minor street must be for the same 8 hours. The higher volume on the minor street is not required to be from the same approach during each of these 8 hours.</p> <p>Option: If the posted speed limit exceeds 40 mph, or if the intersection lies within an isolated community with a population of less than 10,000, the 70% columns may be used in place of the 100% columns.</p>	<input type="checkbox"/>	<input type="checkbox"/>
	<p>OR</p>	<p>Both of the following conditions exist for each of any 8 hours of an average day:</p> <p>A. The VPH given in the 80% column of Table 1-A-1 and Table 1-A-2 exist, <u>and</u></p> <p>B. The VPH given in the 80% column of Table 1-B-1 and Table 1-B-2 exist.</p> <p>Note: The major street and minor street volumes must be for the same 8 hours of each condition, however, the 8 hours satisfied in Table 1-A does not have to be the same 8 hours satisfied in Table 1-B. On the minor street, the higher volume does not need to be from the same approach during each of these 8 hours.</p>	<input type="checkbox"/>

Table 1-A Eight Hour Vehicular Volume

-1. Volume required for each of any 8 hours on major street (Total of both approaches)

Number of Lanes		100%	80%	70%
Major Street	Minor Street			
1	1	500	400	350
2 or more	1	600	480	420
2 or more	2 or more	600	480	420
1	2 or more	500	400	350

-2. Volume required for each of any 8 hours on minor street approach (One direction only)

Number of Lanes		100%	80%	70%
Major Street	Minor Street			
1	1	150	120	105
2 or more	1	150	120	105
2 or more	2 or more	200	160	140
1	2 or more	200	160	140

Number Hours Met (8 Req'd)

Table 1-B Eight Hour Interruption of Continuous Traffic

-1. Volume required for each of any 8 hours on major street (Total of both approaches)

Number of Lanes		100%	80%	70%
Major Street	Minor Street			
1	1	750	600	525
2 or more	1	900	720	630
2 or more	2 or more	900	720	630
1	2 or more	750	600	525

-2. Volume required for each of any 8 hours on minor street approach (One direction only)

Number of Lanes		100%	80%	70%
Major Street	Minor Street			
1	1	75	60	50
2 or more	1	75	60	50
2 or more	2 or more	100	80	70
1	2 or more	100	80	70

Number Hours Met (8 Req'd)

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Warrant	Description	Compliance	
		Yes	No
<p>2</p> <p>Four-Hour Vehicular Volume</p>	<p>For each of any 4 hours of an average day, the plotted points on <u>Figure 1</u> represent 100% VPH on the major street (total of both approaches.)</p> <p>and</p> <p>The VPH on the higher-volume minor street approach (one direction only) fall above the applicable curve for the existing combination of approach lanes.</p> <p>On the minor street, the higher volume does not need to be from the same approach during each of these 4 hours.</p> <p>Use <u>Figure 2</u>, 70% chart if the speed limit exceeds 40 mph or if this is an isolated community with a population of less than 10,000.</p>	<input type="checkbox"/>	<input type="checkbox"/>

Figure 1. Warrant 2, Four-Hour Vehicular Volume (100% Factor)

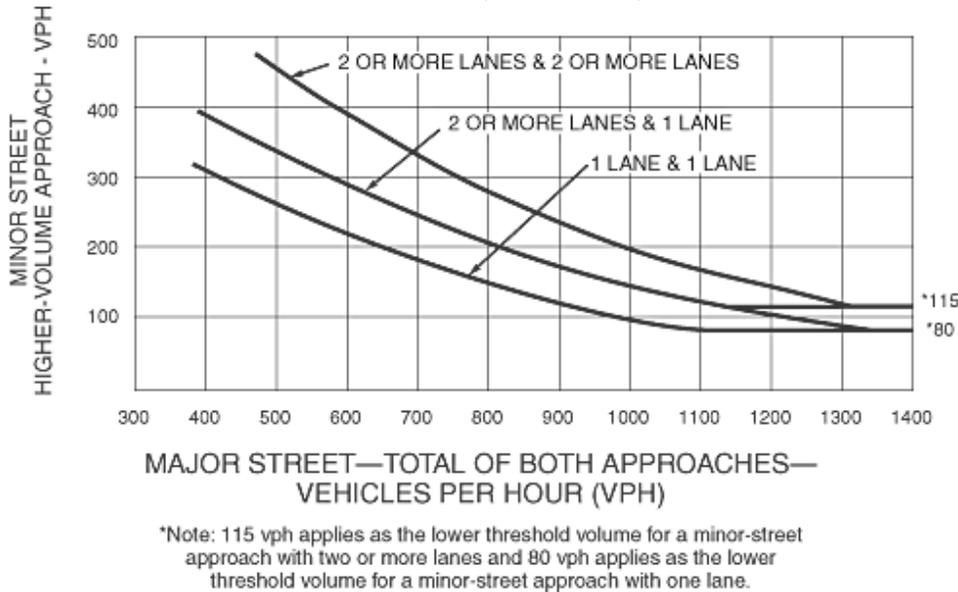
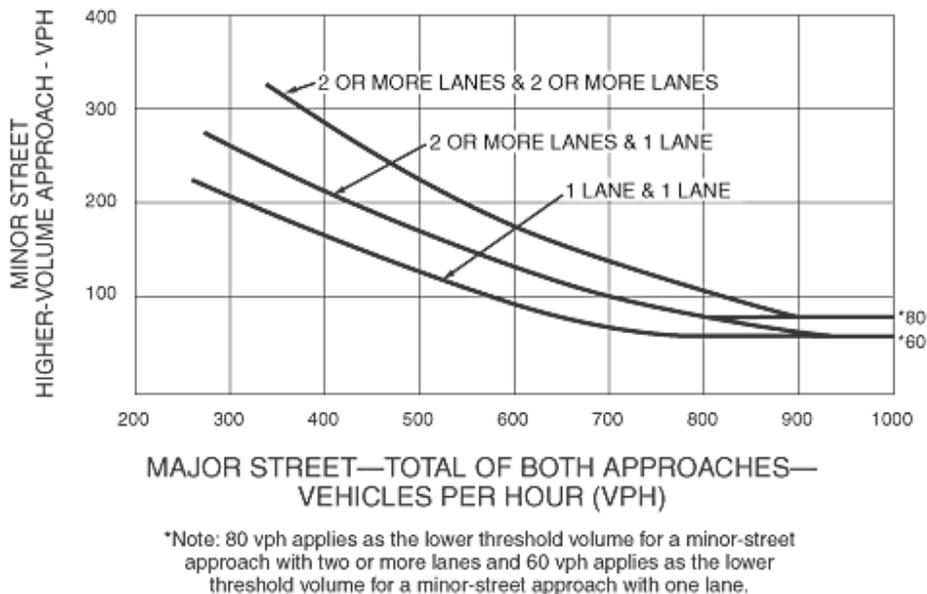


Figure 2. Warrant 2, Four-Hour Vehicular Volume (70% Factor)



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Warrant	Description	Compliance	
		Yes	No
3 Peak Hour	If either of the two following categories (A or B) are met: A. If all three of the following conditions exist for the same 1 hour (any four consecutive 15-minute periods) of an average day: 1. The total vehicle stopped time delay on a minor street approach (one direction only) controlled by a STOP sign equals or exceeds: 4 vehicle-hours for a one-lane approach, or 5-vehicle-hours for a two-lane approach, <u>and</u> 2. The volume on the same minor street approach (one direction only) equals or exceeds: 100 VPH for one moving lane of traffic, or 150 VPH for two moving lanes, <u>and</u> 3. The total volume entering during the hour equals or exceeds: 650 VPH for intersections with three approaches, or 800 VPH for intersections with four or more approaches.	<input type="checkbox"/>	<input type="checkbox"/>
	OR		
	B. The plotted point representing the VPH on the major street (total of both approaches) and the corresponding VPH on the higher-volume minor street approach (one direction only) for 1 hour (any four consecutive 15-minute periods) of an average day falls above the applicable curve in <u>Figure 3</u> , Peak Hour (100% Factor) for the existing combination of approach lanes. Use <u>Figure 4</u> , Peak Hour (70% Factor) if the speed limit exceeds 40 mph, or if the intersection lies within a built-up area of an isolated community having a population of less than 10,000.	<input type="checkbox"/>	<input type="checkbox"/>

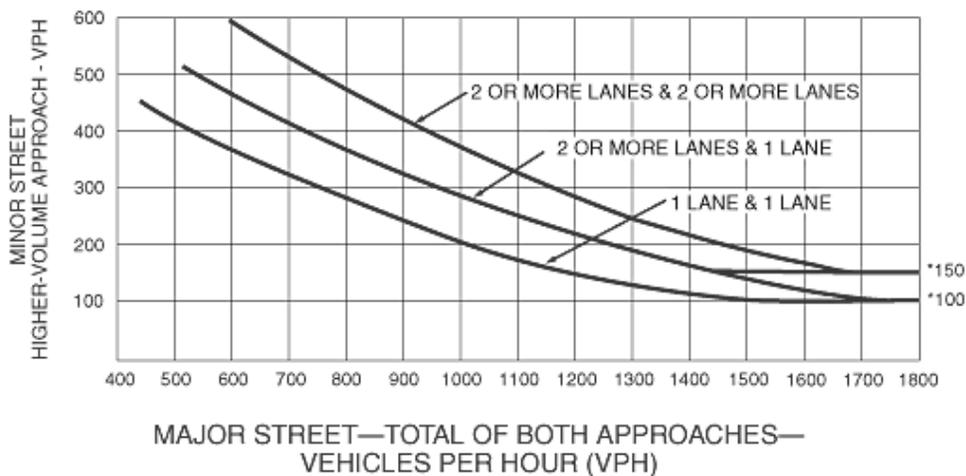
Notes for 3, Peak Hour

The Peak Hour Signal Warrant is intended for use at a location where, for a minimum of 1 hour of an average day, traffic on the minor street suffers undue delay when entering or crossing the major street. This signal warrant must be applied only in unusual circumstances. Such cases include high-occupancy facilities that attract or release large numbers of vehicles over a short period of time.

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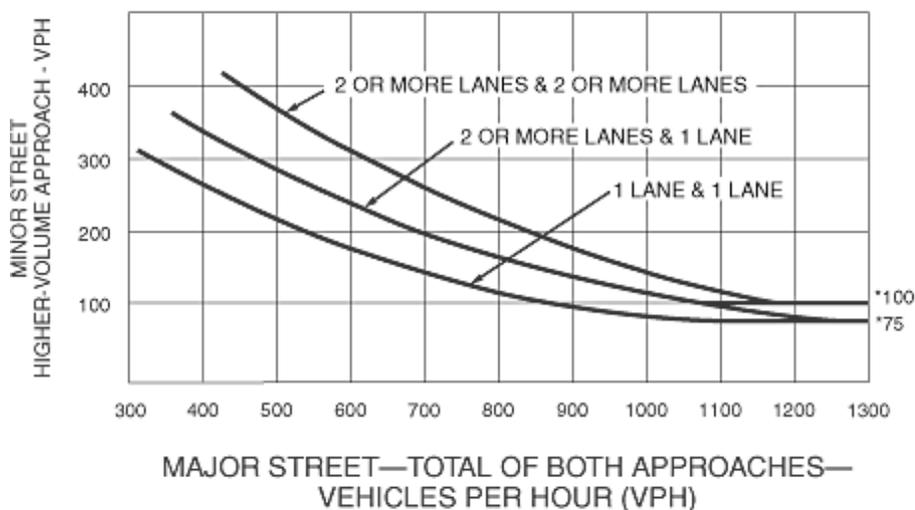
Figure 3. Warrant 3, Peak Hour (100% Factor)



*Note: 150 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 100 vph applies as the lower threshold volume for a minor-street approach with one lane.

Figure 4. Warrant 3, Peak Hour (70% Factor)

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 70 km/h OR ABOVE 40 mph ON MAJOR STREET)



*Note: 100 vph applies as the lower threshold volume for a minor-street approach with two or more lanes and 75 vph applies as the lower threshold volume for a minor-street approach with one lane.

Warrant	Description	Compliance	
		Yes	No
4 Pedestrian Volume	A. Pedestrian volume crossing the major street during an average day is 100 or more for each of any 4 hours, or 190 or more during any one hour; and B. There are fewer than 60 gaps per hour in the traffic stream to allow pedestrians to cross during the same period when the pedestrian volume criterion is satisfied. Where there is a divided street having a median of sufficient width for pedestrians to wait, the requirement applies separately to each direction of vehicular traffic. See note on next page.	<input type="checkbox"/>	<input type="checkbox"/>

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Warrant	Description	Compliance	
		Yes	No
5 School Crossing	A. Number of gaps in traffic stream during the period children are using the crossing is less than the number of minutes in the same period; <u>and</u> B. At least 20 children use the crossing during the latest crossing hour;	<input type="checkbox"/>	<input type="checkbox"/>

Notes for 4, Pedestrian Volume and 5, School Crossing

Shall not be applied if at location where the distance to the nearest traffic control signal along the major street is less than 300 feet, unless the proposed traffic control signal will not restrict the progressive movement of traffic.

6 Coordinated Signal System	A. In a one-way street or on a street that has traffic predominantly in one direction, the adjacent traffic control signals are so far apart that they do not provide the necessary degree of vehicular platooning; <u>or</u> B. On a two-way street, adjacent traffic control signals do not provide the necessary degree of platooning and the proposed and adjacent traffic control signals will collectively provide a progressive movement.	<input type="checkbox"/>	<input type="checkbox"/>
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7 Crash Experience	A. Adequate trial of alternatives with satisfactory observance and enforcement has failed to reduce the crash frequency; <u>and</u> B. Five or more reported crashes of type susceptible to correction by a traffic control signal have occurred within a 12-month period, each crash involving personal injury or property damage apparently exceeding the applicable requirements for a reportable crash; <u>and</u> C. For each of any 8 hours of an average day, the VPH given in both of the 80% columns in Tables 1-A-1 and 1-A-2 or the VPH in both of the 80% columns in Tables 1-B-1 and 1-B-2 exists on the major street and the higher-volume minor street approach, respectively, to the intersection, or the volume of pedestrian traffic is not less than 80% of the requirements specified in the Pedestrian Volume Warrant. These major street and minor street volumes shall be for the same 8 hours. On the minor street, the higher volume shall not be required to be on the same approach during each of the 8 hours.	<input type="checkbox"/>	<input type="checkbox"/>
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8 Roadway Network	A. The intersection has a total existing or immediately projected entering volume of at least 1,000 VPH during the peak hour of a typical weekday and has 5-year projected traffic volumes based on an engineering study that meet one or more of Warrants 1,2 and 3 during an average weekday; <u>or</u> B. The intersection has a total existing or immediately projected entering volume of at least 1,000 VPH for each of any 5 hours of a non-normal business day (Saturday or Sunday). Note: A major route as used in this warrant shall have one or more of these characteristics: 1. Principal network for through traffic 2. Includes a highway entering a city 3. Appears as a major route on an official plan	<input type="checkbox"/>	<input type="checkbox"/>
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District Traffic Engineer's Signature	Date
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