

## **APPENDIX I**

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- Signal Warrants Worksheets

**Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 2 of 4)**

Major Street: Boston Ave Date: 2010-09-22  
 Minor Street: 29th St-I-5 SB On ramp Scenario: Year 2030

**WARRANT 2 - Four Hour Vehicular Volume** SATISFIED\* YES  NO

Record hourly vehicular volumes for any four hours of an average day.

APPROACH LANES	Hour			
	One	2 or More		
Both Approaches - Major Street				
Higher Approach - Minor Street				

*All plotted points fall above the curves in Figure 4C-1. (URBAN AREAS)	Yes <input type="checkbox"/>	No <input type="checkbox"/>
<u>OR</u> , All plotted points fall above the curves in Figure 4C-2. (RURAL AREAS)	Yes <input type="checkbox"/>	No <input type="checkbox"/>

**WARRANT 3 - Peak Hour** SATISFIED YES  NO   
 (Part A or Part B must be satisfied)

**PART A** SATISFIED YES  NO

(All parts 1, 2, and 3 below must be satisfied for the same one hour, for any four consecutive 15-minute periods)

1. The total delay experienced for traffic on one minor street approach (one direction only) controlled by a STOP sign equals or exceeds four vehicle-hours for a one-lane approach, or five vehicle-hours for a two-lane approach; <u>AND</u>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
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>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
3. The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with four or more approaches or 650 vph for intersections with three approaches.	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>

**PART B** SATISFIED YES  NO

APPROACH LANES	Hour	
	One	2 or More
Both Approaches - Major Street	x	
Higher Approach - Minor Street	x	

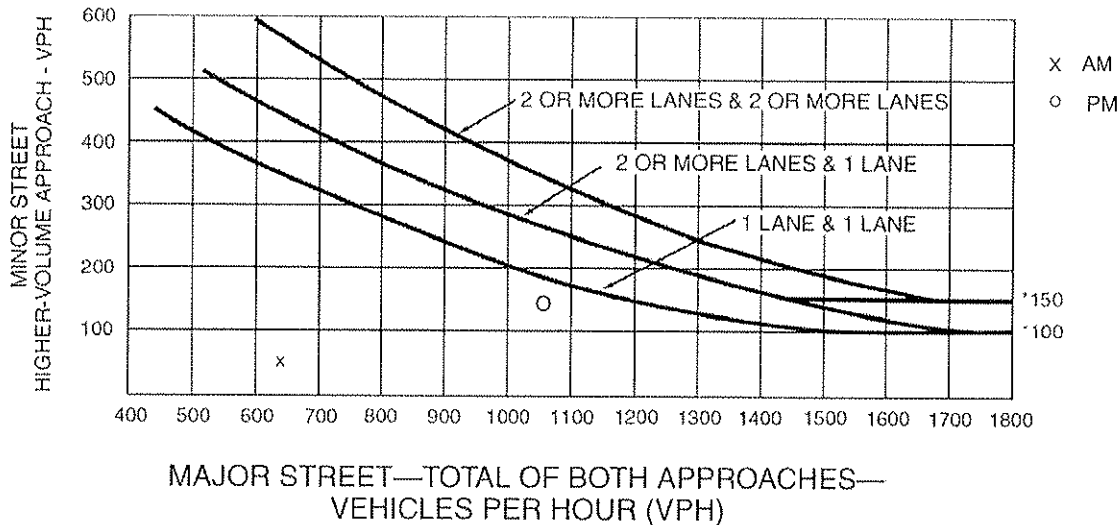
AM 623 PM 1076  
 AM 61 PM 143

The plotted point falls above the curve in Figure 4C-3.	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>
<u>OR</u> , The plotted point falls above the curve in Figure 4C-4.	Yes <input type="checkbox"/>	No <input type="checkbox"/>

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

**Figure 4C-3. Warrant 3, Peak Hour**

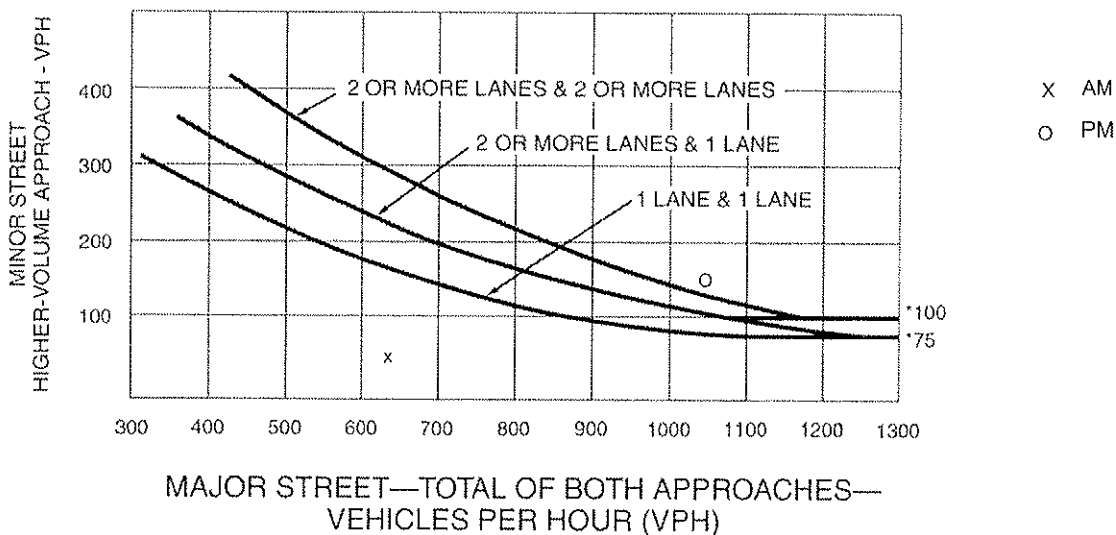
Major Street: Boston Ave Date: 09-22-2010  
 Minor Street: 29th St - I-5 SB On-ramp Scenario: Year 2030



\*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 4C-4. Warrant 3, Peak Hour (70% Factor)**

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 79.64 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.

**Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 2 of 4)**

Major Street: Harbor Dr

Date: 2010-09-22

Minor Street: Sigsbee St

Scenario: Year 2030

**WARRANT 2 - Four Hour Vehicular Volume**

SATISFIED\* YES  NO

Record hourly vehicular volumes for any four hours of an average day.

APPROACH LANES	Hour			
	One	2 or More		
Both Approaches - Major Street				
Higher Approach - Minor Street				

*All plotted points fall above the curves in Figure 4C-1. (URBAN AREAS)	Yes <input type="checkbox"/>	No <input type="checkbox"/>
<u>OR</u> , All plotted points fall above the curves in Figure 4C-2. (RURAL AREAS)	Yes <input type="checkbox"/>	No <input type="checkbox"/>

**WARRANT 3 - Peak Hour**  
 (Part A or Part B must be satisfied)

SATISFIED YES  NO

**PART A**

SATISFIED YES  NO

(All parts 1, 2, and 3 below must be satisfied for the same one hour, for any four consecutive 15-minute periods)

1. The total delay experienced for traffic on one minor street approach (one direction only) controlled by a STOP sign equals or exceeds four vehicle-hours for a one-lane approach, or five vehicle-hours for a two-lane approach; <u>AND</u>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
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>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
3. The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with four or more approaches or 650 vph for intersections with three approaches.	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>

**PART B**

SATISFIED YES  NO

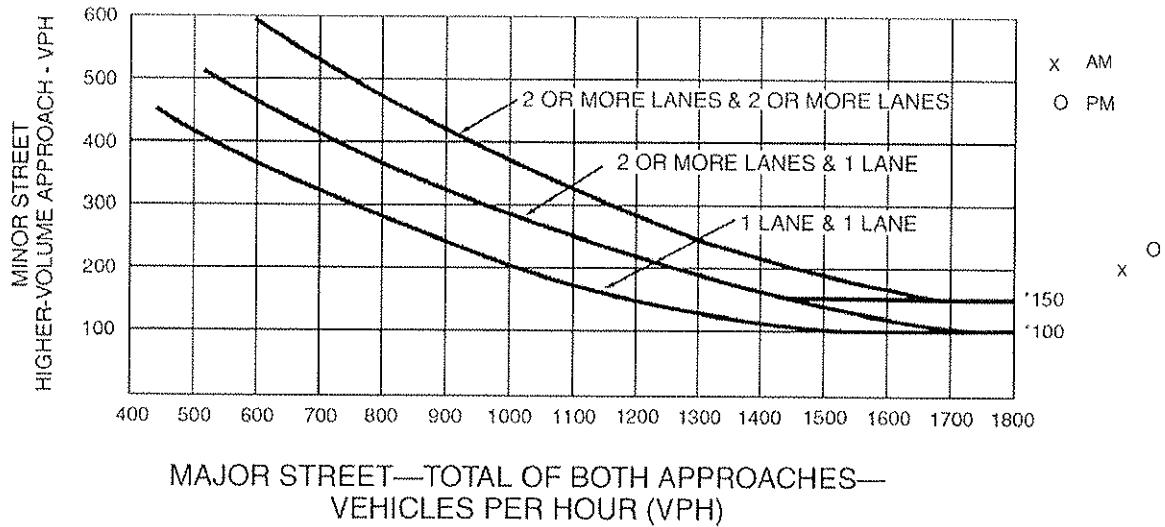
APPROACH LANES			AM	Hour PM
	One	2 or More		
Both Approaches - Major Street		x	2190	2955
Higher Approach - Minor Street	x		200	160

The plotted point falls above the curve in Figure 4C-3.	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
<u>OR</u> , The plotted point falls above the curve in Figure 4C-4.	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

**Figure 4C-3. Warrant 3, Peak Hour**

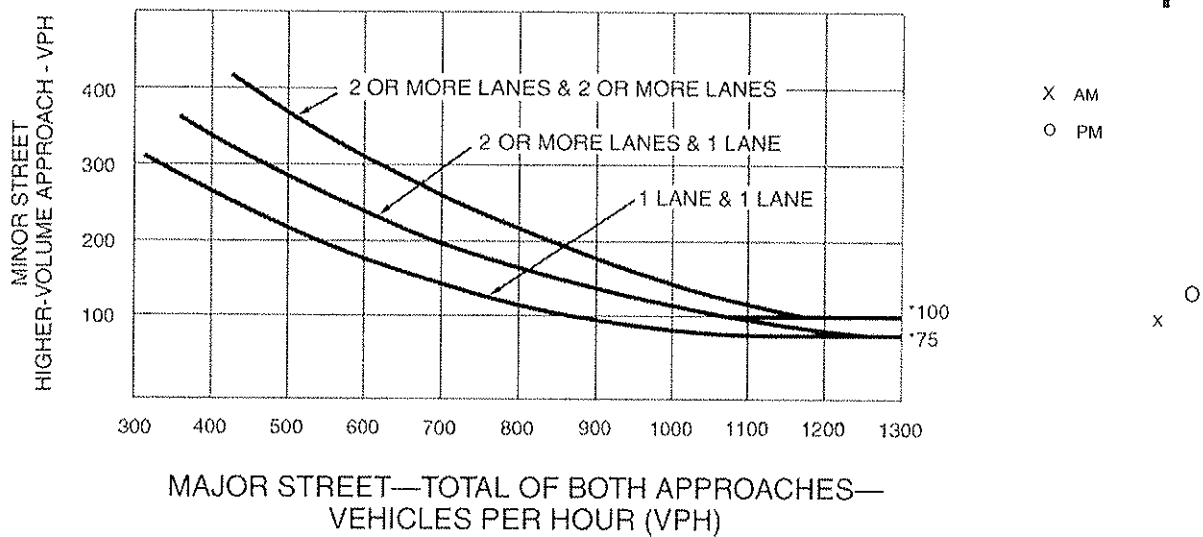
Major Street: Harbor Dr Date: 09-22-2010  
 Minor Street: Sigsbee St Scenario: Year 2030



\*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 4C-4. Warrant 3, Peak Hour (70% Factor)**

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 70 64 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.

**Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 2 of 4)**

Major Street: Logan Ave Date: 2010-09-22  
 Minor Street: Beardsley St / I-5 SB Ramps Scenario: Year 2030

**WARRANT 2 - Four Hour Vehicular Volume** SATISFIED\* YES  NO

Record hourly vehicular volumes for any four hours of an average day.

APPROACH LANES	2 or		Hour			
	One	More				
Both Approaches - Major Street						
Higher Approach - Minor Street						

*All plotted points fall above the curves in Figure 4C-1. (URBAN AREAS)	Yes <input type="checkbox"/>	No <input type="checkbox"/>
<u>OR</u> , All plotted points fall above the curves in Figure 4C-2. (RURAL AREAS)	Yes <input type="checkbox"/>	No <input type="checkbox"/>

**WARRANT 3 - Peak Hour** SATISFIED YES  NO   
 (Part A or Part B must be satisfied)

**PART A** SATISFIED YES  NO

(All parts 1, 2, and 3 below must be satisfied for the same one hour, for any four consecutive 15-minute periods)

1. The total delay experienced for traffic on one minor street approach (one direction only) controlled by a STOP sign equals or exceeds four vehicle-hours for a one-lane approach, or five vehicle-hours for a two-lane approach; <u>AND</u>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
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>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
3. The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with four or more approaches or 650 vph for intersections with three approaches.	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>

**PART B** SATISFIED YES  NO

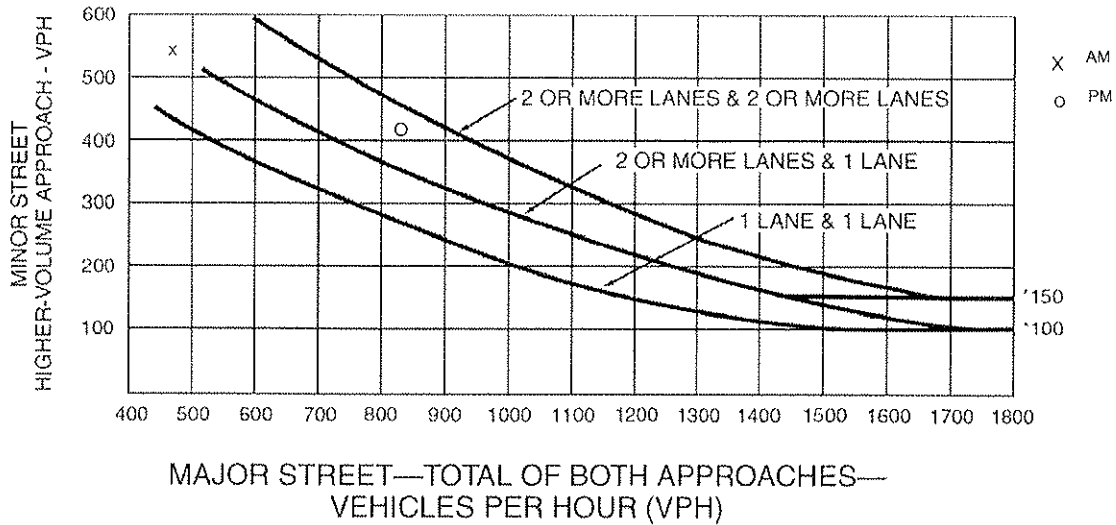
APPROACH LANES	2 or		AM	Hour PM
	One	More		
Both Approaches - Major Street	x		498	802
Higher Approach - Minor Street	x		544	420

The plotted point falls above the curve in Figure 4C-3.	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
<u>OR</u> , The plotted point falls above the curve in Figure 4C-4.	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

**Figure 4C-3. Warrant 3, Peak Hour**

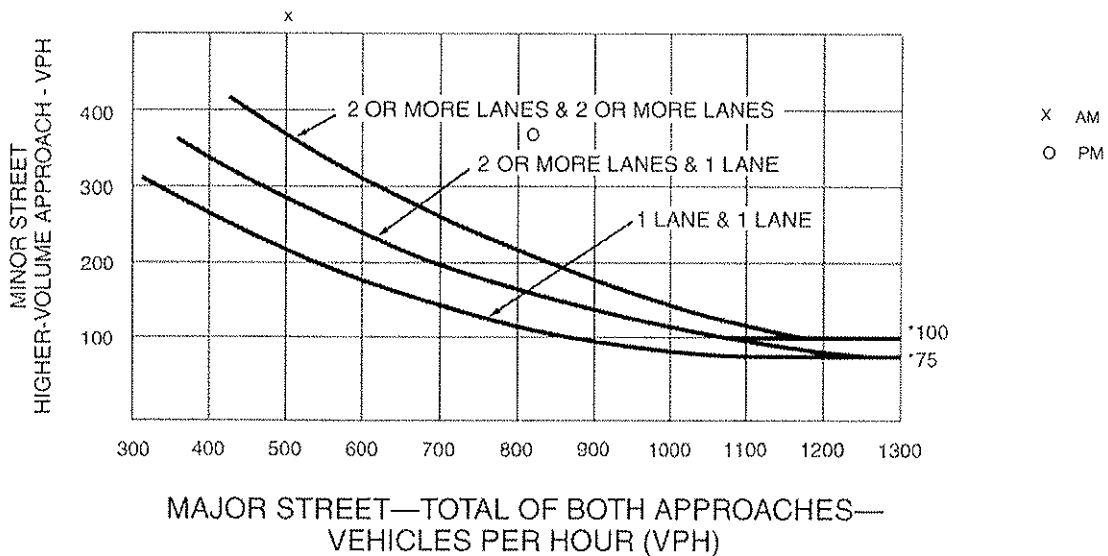
Major Street: Logan Ave Date: 09-22-2010  
 Minor Street: Beardsley St / I-5 SB Ramps Scenario: Year 2030



\*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 4C-4. Warrant 3, Peak Hour (70% Factor)**

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 70 64 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.

**Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 2 of 4)**

Major Street: Logan Ave Date: 2010-09-22  
 Minor Street: Sampson St Scenario: Year 2030

**WARRANT 2 - Four Hour Vehicular Volume** SATISFIED\* YES  NO

Record hourly vehicular volumes for any four hours of an average day.

APPROACH LANES	2 or		Hour			
	One	More				
Both Approaches - Major Street						
Higher Approach - Minor Street						

*All plotted points fall above the curves in Figure 4C-1. (URBAN AREAS)	Yes <input type="checkbox"/>	No <input type="checkbox"/>
<u>OR</u> , All plotted points fall above the curves in Figure 4C-2. (RURAL AREAS)	Yes <input type="checkbox"/>	No <input type="checkbox"/>

**WARRANT 3 - Peak Hour** SATISFIED YES  NO   
 (Part A or Part B must be satisfied)

**PART A** SATISFIED YES  NO

(All parts 1, 2, and 3 below must be satisfied for the same one hour, for any four consecutive 15-minute periods)

1. The total delay experienced for traffic on one minor street approach (one direction only) controlled by a STOP sign equals or exceeds four vehicle-hours for a one-lane approach, or five vehicle-hours for a two-lane approach; <u>AND</u>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
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>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
3. The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with four or more approaches or 650 vph for intersections with three approaches.	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>

**PART B** SATISFIED YES  NO

APPROACH LANES	2 or		AM	Hour PM
	One	More		
Both Approaches - Major Street	x		725	854
Higher Approach - Minor Street	x		312	354

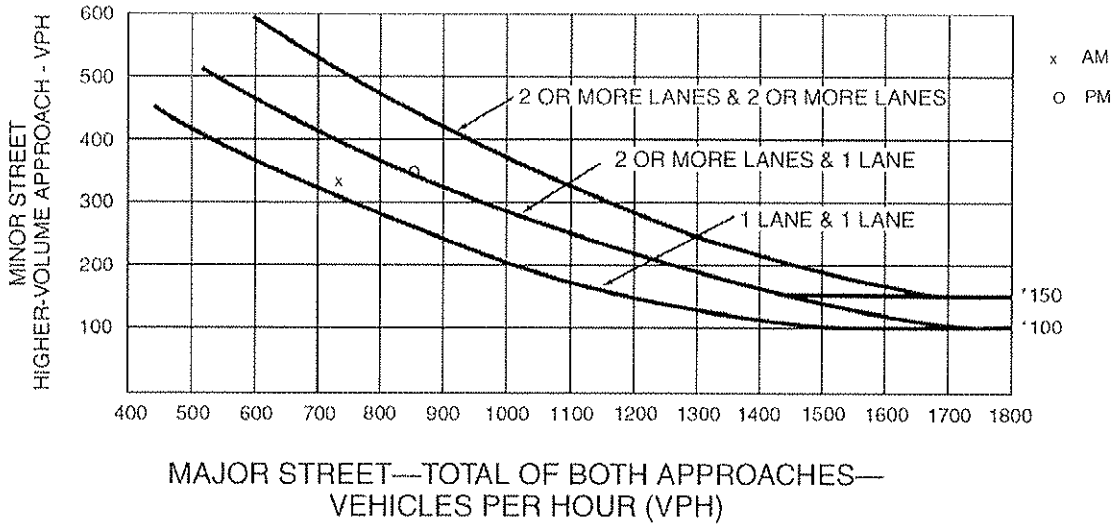
The plotted point falls above the curve in Figure 4C-3.	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
<u>OR</u> , The plotted point falls above the curve in Figure 4C-4.	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.



**Figure 4C-3. Warrant 3, Peak Hour**

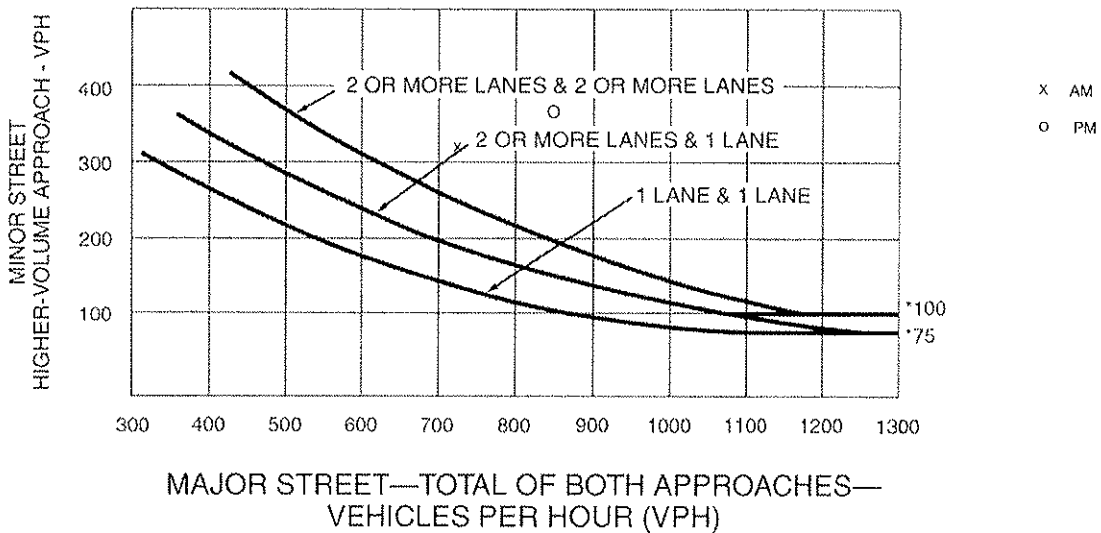
Major Street: Logan Ave Date: 09-22-2010  
 Minor Street: Sampson St Scenario: Year 2030



\*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 4C-4. Warrant 3, Peak Hour (70% Factor)**

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 70 64 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.

**Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 2 of 4)**

Major Street: National Ave Date: 2010-09-22  
 Minor Street: 16th St Scenario: Year 2030

**WARRANT 2 - Four Hour Vehicular Volume** SATISFIED\* YES  NO

Record hourly vehicular volumes for any four hours of an average day.

APPROACH LANES			Hour		
	One	2 or More			
Both Approaches - Major Street					
Higher Approach - Minor Street					

*All plotted points fall above the curves in Figure 4C-1. (URBAN AREAS)	Yes <input type="checkbox"/>	No <input type="checkbox"/>
<u>OR</u> , All plotted points fall above the curves in Figure 4C-2. (RURAL AREAS)	Yes <input type="checkbox"/>	No <input type="checkbox"/>

**WARRANT 3 - Peak Hour** SATISFIED YES  NO   
 (Part A or Part B must be satisfied)

**PART A** SATISFIED YES  NO

(All parts 1, 2, and 3 below must be satisfied for the same one hour, for any four consecutive 15-minute periods)

1. The total delay experienced for traffic on one minor street approach (one direction only) controlled by a STOP sign equals or exceeds four vehicle-hours for a one-lane approach, or five vehicle-hours for a two-lane approach; <u>AND</u>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
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>	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
3. The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with four or more approaches or 650 vph for intersections with three approaches.	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>

**PART B** SATISFIED YES  NO

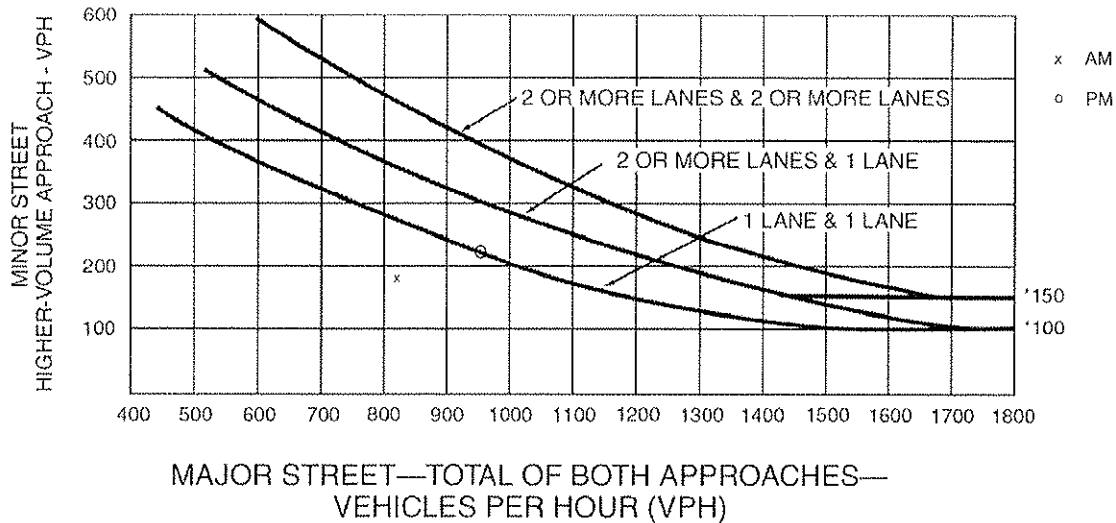
APPROACH LANES			AM	Hour PM
	One	2 or More		
Both Approaches - Major Street	x		806	955
Higher Approach - Minor Street	x		192	220

The plotted point falls above the curve in Figure 4C-3.	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>
<u>OR</u> , The plotted point falls above the curve in Figure 4C-4.	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

**Figure 4C-3. Warrant 3, Peak Hour**

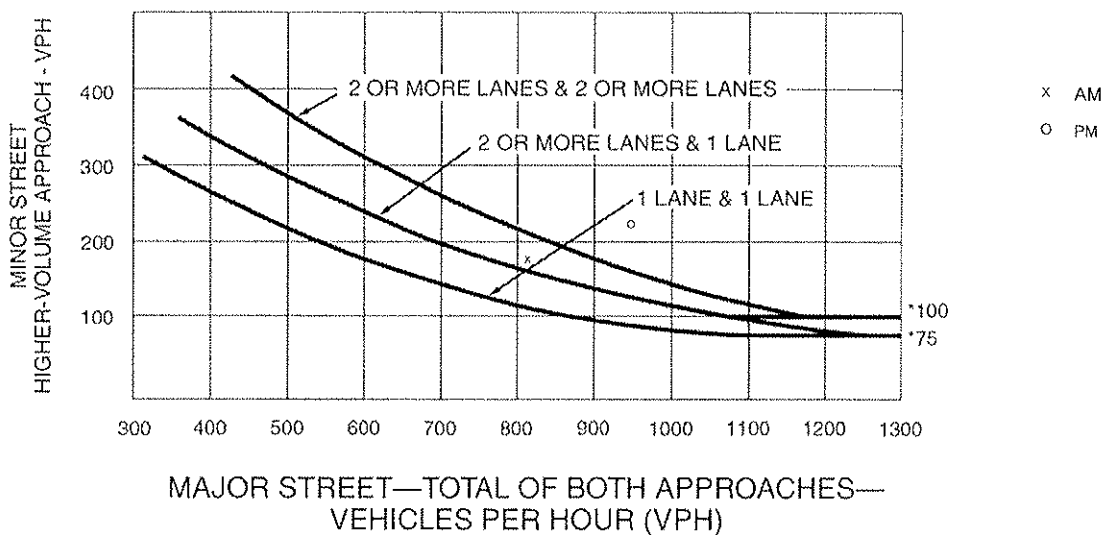
Major Street: National Ave Date: 09-22-2010  
 Minor Street: 16th St Scenario: Year 2030



\*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 4C-4. Warrant 3, Peak Hour (70% Factor)**

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 79 64 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.

**Figure 4C-101 (CA). Traffic Signal Warrants Worksheet (Sheet 2 of 4)**

Major Street: National Ave Date: 2010-09-22  
 Minor Street: Beardsley St Scenario: Year 2030

**WARRANT 2 - Four Hour Vehicular Volume** SATISFIED\* YES  NO

Record hourly vehicular volumes for any four hours of an average day.

APPROACH LANES	Hour			
	One	2 or More		
Both Approaches - Major Street				
Higher Approach - Minor Street				

*All plotted points fall above the curves in Figure 4C-1. (URBAN AREAS)	Yes <input type="checkbox"/> No <input type="checkbox"/>
<u>OR</u> , All plotted points fall above the curves in Figure 4C-2. (RURAL AREAS)	Yes <input type="checkbox"/> No <input type="checkbox"/>

**WARRANT 3 - Peak Hour** SATISFIED YES  NO   
 (Part A or Part B must be satisfied)

**PART A** SATISFIED YES  NO

(All parts 1, 2, and 3 below must be satisfied for the same one hour, for any four consecutive 15-minute periods)

1. The total delay experienced for traffic on one minor street approach (one direction only) controlled by a STOP sign equals or exceeds four vehicle-hours for a one-lane approach, or five vehicle-hours for a two-lane approach; <u>AND</u>	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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>	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
3. The total entering volume serviced during the hour equals or exceeds 800 vph for intersections with four or more approaches or 650 vph for intersections with three approaches.	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

**PART B** SATISFIED YES  NO

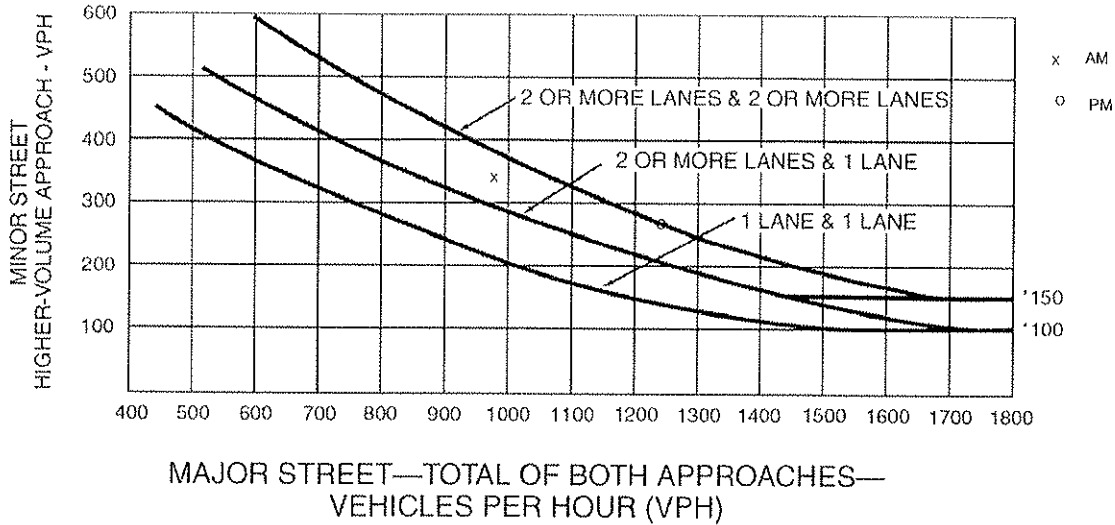
APPROACH LANES	Hour		AM	PM
	One	2 or More		
Both Approaches - Major Street	x		996	1204
Higher Approach - Minor Street	x		374	282

The plotted point falls above the curve in Figure 4C-3.	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
<u>OR</u> , The plotted point falls above the curve in Figure 4C-4.	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal.

**Figure 4C-3. Warrant 3, Peak Hour**

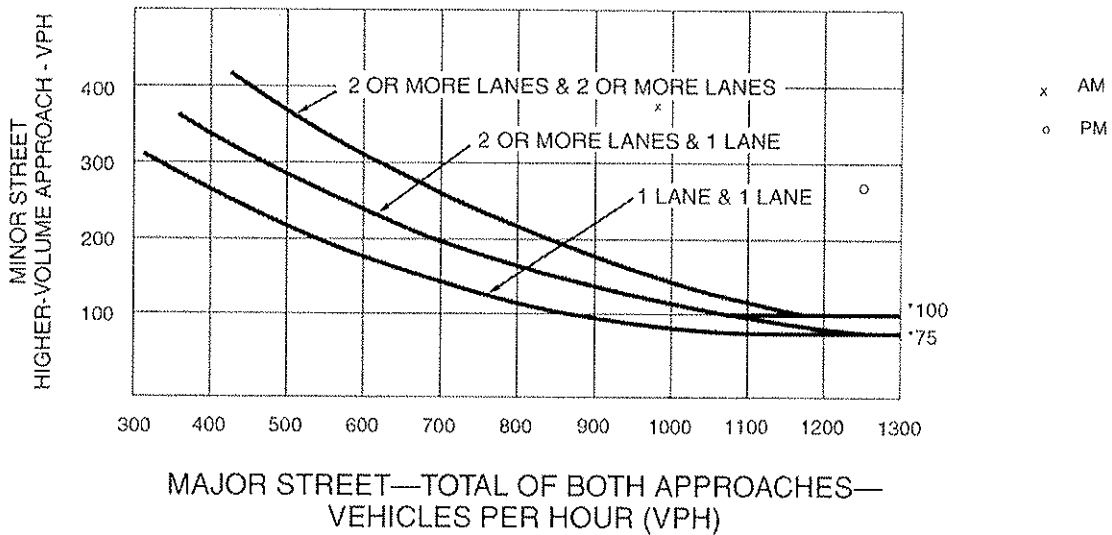
Major Street: National Ave Date: 09-22-2010  
 Minor Street: Beardsley St Scenario: Year 2030



\*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 4C-4. Warrant 3, Peak Hour (70% Factor)**

(COMMUNITY LESS THAN 10,000 POPULATION OR ABOVE 70 64 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.