

46th Street and Van Ness Street

Traffic Signal vs. All-Way Stop Control Analysis

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Signal Removal Process

- 1. Receipt of request from the community for signal decommissioning**
 - 2. Field Investigation and Traffic Analysis – Before Condition**
 - 3. Issue NOI**
 - 4. All-way Red Flash Activation**
 - 5. All-way Static Sign Installation/Intersection Monitoring/Enforcement**
 - 6. Partial Deactivation of Traffic Signal Hardware**
 - 7. Field Investigation and Traffic Analysis – After Condition**
 - 8. Complete Evaluation**
 - 9. Complete Removal of Traffic Signal – With availability of funding**
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Existing Conditions

- ❖ Located in Ward 3.
- ❖ 46th St – Collector; Van Ness St - Collector
- ❖ Posted speed limit of 25 mph on both 46th St and Van Ness St
- ❖ Average Daily Traffic:
 - ❖ 46th St – 3,000 vehicles
 - ❖ Van Ness St – 3,300 vehicles
- ❖ Minimal pedestrian traffic volumes on 46th and Van Ness Streets

Traffic Analysis Methodology

1. Traffic Signal Warrant Analysis

2. Traffic Flow Impacts

- i. Level of Service and Delay**
- ii. Vehicle Queuing**
- iii. Vehicle Stops and Fuel Consumption**

3. Safety Impacts

- i. Intersection Sight Distance**
 - ii. Vehicular Speeding**
 - iii. Compliance with Traffic Control Devices**
 - iv. Accident Analysis**
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Traffic Analysis

1. Traffic Signal Warrant Analysis

- An engineering study of traffic conditions, pedestrian characteristics, and physical characteristics of the location shall be performed to determine whether installation of a traffic control signal is justified at a particular location (2009 MUTCD).
- Investigation of need for a traffic signal shall include analysis of existing vehicular volumes, operations, intersection geometry, pedestrian volumes and other applicable factors contained in the following NINE traffic signal warrants.
- The satisfaction of a traffic signal warrant or warrants shall not in itself require the installation of a traffic control signal (2009 MUTCD).

Traffic Analysis

Warrant	Criteria			Warrant Satisfied
	Major Street	Minor Street	No. of Hours	
1. Eight-Hour Volume				
1A – Minimum Vehicular Volume	600 vph	150 vph	8	NO
1B – Interruption of Continuous Traffic	900 vph	75 vph	8	NO
1C – Combination of Conditions A and B				
Minimum Vehicular Volume	480 vph	120 vph	8	NO
Interruption of Continuous Traffic	120 vph	60 vph	8	NO
2. Four-Hour Volume	See MUTCD for Charts			NO
3. Peak-Hour	See MUTCD for Charts			NO
4. Pedestrian Volume	See MUTCD for more details			NO
5. School Crossing	Not Applicable			NO
6. Coordinated Signal System	Not Applicable			NO
7. Crash Experience	5+ Crashes in 12 months			NO
8. Roadway Network	Not Applicable			NO
9. Intersection Near a Grade Crossing	Not Applicable			NO

Traffic Analysis

2. Traffic Flow Impacts

Level of Service and Delay

- DDOT staff performed level of service (LOS) analysis for study intersection with a traffic signal and all-way stop control signs for both AM and PM peak hours.
- The LOS analysis shows better intersection service level and vehicle delays under both traffic signal than under all-way stop sign control.

Traffic Control	AM Peak-Hour		PM Peak-Hour	
	LOS	Delay	LOS	Delay
Traffic Signal	B	11.3 sec/vehicle	B	18.8 sec/vehicle
All Way Stop Control	A	8.8 sec/vehicle	A	9.4 sec/vehicle

Traffic Analysis

2. Traffic Flow Impacts

Queuing Analysis

- DDOT staff performed 95th-percentile queuing analysis for the study intersection with traffic signal and all-way stop control for both AM and PM peak hours.
- The queuing analysis shows SHORTER vehicle queue results under all-way stop sign control than under traffic signal control for both AM and PM peak hours.

Traffic Analysis

2. Traffic Flow Impacts

Queuing – AM Peak-Hour

Traffic Control	EB	WB	NB	SB
Traffic Signal	29 feet	93 feet	13 feet	38 feet
All-Way Stop Control	5 feet	18 feet	8 feet	30 feet

Queuing – PM Peak-Hour

Traffic Control	EB	WB	NB	SB
Traffic Signal	35 feet	193 feet	23 feet	24 feet
All-Way Stop Control	5 feet	35 feet	18 feet	20 feet

Traffic Analysis

2. Traffic Flow Impacts

Results

The analysis of traffic flow impacts with a traffic signal and with all-way stop control for both AM and PM peak hours at the study intersection shows:

1. Lower vehicle delays and Better level of service
 2. Shorter vehicle queuing
 3. Increase in number of stops and fuel consumption with all-way stop signs as compared to traffic signal
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Traffic Analysis

3. Safety Impacts

Stopping and Intersection Sight Distance

- **Stopping sight distance is met for all four approaches**
- **As a two-way stop-controlled intersection, the intersection sight distance would not be met due to large, mature trees.**
- **As a four-way stop-controlled intersection, the minimum intersection sight distance would be met.**

Traffic Analysis

3. Safety Impacts

Spot Speed Study

- A Spot Speed Study was performed to determine vehicle speeds when vehicles were approaching the intersection.
- Spot speeds were taken on 46th Street.
- Spot speeds were not taken on Van Ness Street since “free-flow” rarely occurred due to extremely short green time that caused most vehicles to stop at the signal.

46 th Street Approach	Posted Speed	Median Speed	85 th Percentile Speed	10 MPH Pace
Northbound	25	23	28	20-29
Southbound	25	24	28	20-29

Traffic Analysis

3. Safety Impacts

Accident Analysis

- **3-year accident report (Jan 1, 2011 – Dec 31, 2013) shows No Pedestrian or Bicycle Crashes at the intersection.**
- **Two collisions resulting in property damage only, a rear end and a sideswipe, were reported.**

Summary of Findings

1. Traffic signal is NOT warranted at this location under the current conditions
 2. All-way stop control may be considered
 3. Motorist non-compliance observed during field visit with some drivers stopping on green and others running the red light
 4. Pedestrian traffic is relatively low
 5. Spot speed study shows 85th-percentile speed on 46th Street is 3 mph above posted speed
 6. Sight distance requires signal or all-way stop
 7. Similar or better results for vehicle delays, level of service, and vehicle queuing comparing signal and all-way stop control
 8. Removal of traffic signal will reduce maintenance cost
 9. More after-condition analysis required
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Recommendations

1. Deactivate existing signal and convert to all-way stop control following DDOT's signal removal process. (Install all-way stop control signs on 46th Street and Van Ness Street.)
2. Activate all-way flashing red
3. Provide MPD enforcement
4. Monitor speeding and motorist compliance with stop signs
5. Potentially deactivate traffic signal
 - Remove vehicle signal heads ONLY and de-activate signal
 - Keep traffic signal pole, mast-arm, and controller cabinet in place

Q/A



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