NoVA Addendum to Memorandum TE-306

The enclosed guidelines are to be used in the implementation of the Memorandum TE-306. These guidelines are provided for additional clarification and to address the left turn clearances. **But engineering judgment shall govern final decisions at all the time.**

Minimum Clearances:

Yellow Change Interval – 4 seconds.
All Red Clearance Interval – 1 second.

Additional Clarification: Since at present there are no signals in NoVA district with Yellow clearance interval less than 4 seconds and All Red clearance interval less than 1 second, minimum Yellow interval of 4 seconds and minimum All Red interval of 1 second should be used.

Through Movements

Yellow Change Interval calculation - Use memorandum TE-306.
All Red Clearance Interval calculation - Use memorandum TE-306.

Additional Clarification: For typical roadway and driver conditions, the following table may be used. (Deceleration rate of 10 ft/sec^2, posted speed, 1 sec. reaction time)

Yellow Change Interval

	Grade of Approach								
	Uphill					Downhill			
Speed (mph)	+4%	+3%	+2%	+1%	Level	-1%	-2%	-3%	-4%
25	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
30	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
35	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
40	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.5	4.5
45	4.0	4.0	4.0	4.5	4.5	4.5	4.5	5.0	5.0
50	4.5	4.5	4.5	4.5	5.0	5.0	5.0	5.0	5.5
55	4.5	5.0	5.0	5.0	5.0	5.5	5.5	5.5	5.5

All Red Clearance Interval

Speed (mph)	Width of the Roadway to Clear								
	20	30	40	50	60	70	80	90	100
25	1.0	1.5	1.5	2.0	2.5	2.5	3.0	3.0	3.0
30	1.0	1.0	1.5	1.5	2.0	2.0	2.5	2.5	3.0
35	1.0	1.0	1.5	1.5	1.5	2.0	2.0	2.0	2.5
40	1.0	1.0	1.0	1.5	1.5	1.5	2.0	2.0	2.0
45	1.0	1.0	1.0	1.0	1.5	1.5	1.5	2.0	2.0
50	1.0	1.0	1.0	1.0	1.0	1.5	1.5	1.5	1.5
55	1.0	1.0	1.0	1.0	1.0	1.0	1.5	1.5	1.5

Protected *Lead* Left Turns from four way intersections and *mainline* T-intersections

Additional Clarification:

Yellow interval: Speed limits are not posted for the left turn bays and speeds vary significantly along the turn bay depending on whether a vehicle started from the stop condition or entered the turn bay from the mainline. Typically vehicles travel less than 40 mph in the left turn bay within the dilemma zone. There fore under typical conditions, Yellow change interval of 4 seconds may be used.

All Red Interval: Typically vehicles turn left at an average speed of 20 to 25 mph (speeds vary at different points within the intersection) through the intersection. Therefore All Red Clearance intervals may be calculated using a speed of 20 to 25 mph in the memorandum TE-306.

(At all non-typical intersections including but not limited to where the grades are steep, one of the through lanes become left turn lanes, intersections are too wide or too narrow, the left turns are made at diagonal or the observed left turn speeds are lower or higher; Yellow and All Red intervals should be calculated using location specific parameters.)

Protected *Lag* Left Turns from four way intersections and *mainline* T-intersections

Additional Clarification:

Yellow interval: In this case, since it will be confusing for drivers to see different yellow times for the left turns and through movements, the use of mainline yellow interval for the left turn phases may be appropriate.

All Red Interval: Typically vehicles turn left at an average speed of 20 to 25 mph (speeds vary at different points within the intersection) through the intersection. Therefore All Red Clearance intervals may be calculated using a speed of 20 to 25 mph in the memorandum TE-306.

(At all non-typical intersections including but not limited to where the grades are steep, one of the through lanes become left turn lanes, intersections are too wide or too narrow, the left turns are made at diagonal or the observed left turn speeds are lower or higher; Yellow and All Red intervals should be calculated using location specific parameters.)

Left turns from the *Shaft* of a T-intersection

Additional Clarification:

Yellow interval: In this case, as the roadway approaches the end of the shaft, vehicles may be traveling at the posted speed of the roadway within the dilemma zone and therefore use the posted speed and memorandum TE-306.

All Red Interval: Typically vehicles turn left at an average speed of 20 to 25 mph (speeds vary at different points within the intersection) through the intersection. Therefore All Red Clearance intervals may be calculated using a speed of 20 to 25 mph in the memorandum TE-306.

(At all non-typical intersections including but not limited to where the grades are steep, one of the through lanes become left turn lanes, intersections are too wide or too narrow, the left turns are made at diagonal or the observed left turn speeds are lower or higher; Yellow and All Red intervals should be calculated using location specific parameters.)