



Legislation Text

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TO: Board of Mayor and Aldermen

FROM: Eric Stuckey, City Administrator
David Parker, City Engineer
Paul Holzen, Director of Engineering
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SUBJECT:

Consideration of Ordinance 2015-62 "An Ordinance To Establish A No Right Turn On Red Regulation On South Royal Oaks Boulevard At The Northbound Approach To Murfreesboro Road" (Discussed at 10/29/15 CIC AND 12/08/15 WS; 01/12/16 BOMA 7-0) SECOND AND FINAL READING

Purpose

The purpose of this memorandum is to provide a recommendation to the Board of Mayor and Aldermen (BOMA) to install No Turn On Red signing for the northbound Royal Oaks Boulevard right turn movement onto Murfreesboro Road (SR 96 East).

Background

The 2009 widening of Royal Oaks Boulevard and Murfreesboro Road created dual northbound right turn lanes that enter three eastbound through lanes. The dotted guideline installed with that project directs the Royal Oaks curb lane into the Murfreesboro Road curb lane, and the second right turn lane into dual optional middle or inside lanes on Murfreesboro Road. The Engineering Department has received occasional requests from motorists to shift outward this dotted guideline to allow the curb lane the option to enter the middle or outside lanes on Murfreesboro Road. This revision would allow the curb lane vehicles to immediately escape the trap of the outside lane right turn drop located 1100 feet downstream at the southbound I-65 on-ramp. It would also require that the second right turn lane enter the inside eastbound through lane on Murfreesboro Road, which splits into the dedicated left turn lanes for the northbound I-65 ramp just 400 feet downstream from the right turn lane stop line. However, the southbound dual left turns also enter the two inside eastbound through lanes on Murfreesboro Road, thus the discussion has focused on the protection of the right turns and left turns from each other.

Data

Engineering investigations of the right turn crash pattern at the Royal Oaks intersection and through the zone leading to the I-65 southbound ramp showed a total of 19 crashes for the period from January 2013 through June 2015. Only two of these involved lane changing in the downstream area, but seven of them involved

lane changing in the turn itself. Most importantly, thirteen of the crashes involved right turns on red, four of these colliding with southbound left turning vehicles. Comparing the right turn crash rate to the statewide average yields 1.31 crashes per million entering vehicles versus 0.89 for Urban Multi-Lane Divided Signalized Turn Lanes; the crash rate here is 48% above the statewide average.

Clearly the NO TURN ON RED regulation should minimize these conflicts, but may also generate additional stacking and delays for this very heavy movement. To identify the impacts, Engineering-TOC modeled the queue lengths and average delays under the two conditions for comparison. The data in the table below shows that the impacts are still within the acceptable range for Level of Service and increases the stacking length by only 8% (two car lengths) in the critical AM peak period. (The available turn bay storage length is 440 feet.) These impacts are certainly acceptable for the minimization of a high right turn on red (RTOR) crash rate at this intersection.

Murfreesboro Rd & Royal Oaks - Northbound right turn operational comparison				
Peak Period		RTOR	No-RTOR	Difference
AM	95 th percentile Queue	565	609	44 (8%)
	LOS (average second)	C(27.3)	C(32)	4.7 (17%)
PM	95 th percentile Queue	635	661	26 (4%)
	LOS (average second)	D(36.7)	D(42.6)	5.9 (16%)
Mid-Day	95 th percentile Queue	176	267	91 (52%)
	LOS (average second)	C(24.4)	C(29.7)	5.3 (22%)
Evening	95 th percentile Queue	422	467	45 (11%)
	LOS (average second)	C(31.4)	D(37.5)	6.1 (19%)

Options

Given that the RTOR is opposed by a protected dual left turn movement, and that the RTOR crashes exceed the minimum criteria (3 per year) in the Manual on Uniform Traffic Control Devices, there is definite justification for installing the NO TURN ON RED regulation. The available options are as follows:

1. Install NO TURN ON RED signing for northbound Royal Oaks Boulevard at SR 96 as a safety measure based on this engineering investigation. Per research reported by the University of Nebraska, significant improvements in compliance can be obtained by placing a red ball on the sign. For added emphasis, use the largest size possible, 36" x 48", and mount adjacent to both the far side mast arm signal head and the near side pedestal signal head.
2. Revise the dotted guideline marking to allow the northbound curb lane to turn into dual optional outside and middle lanes on eastbound SR96. The second turn lane would be guided into the inside through lane (with its downstream diverge to left turn lanes onto I-65), as a lane balancing measure. For proper application, this option must be applied as option 3 below.
3. Combine options 1 and 2.
4. No action - considers that the pattern of lane shifting and crash activity is acceptable.

Financial Impact

The estimated financial impacts are as follows:

Option 1 - Expenditure of \$500 for two signs, one at the near side signal pedestal and one at the far side signal mast arm. Apply the Streets Department traffic sign budget.

Option 2 - See option 3.

Option 3 - Expenditure of about \$400 for two signs, and about \$4,000 for milling and overlay needed to accommodate the re-marking of the dotted guideline.

Option 4 - No cost except ongoing Police and emergency response expenses.

Recommendation

Adopt Option 1 and apply the Streets Department traffic sign budget.