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| | Regular Mail |
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| TO: | The City of Parkville, Missouri |
| FROM: | Todd Fredericksen PE, PTOE Tom Fulton, Senior Project Manager |
| RE: | Traffic Signal Warrant (Route 45 & Julian Drive) |
| DATE: | November 9, 2015 |
| PROJECT #: | 012-2561 |

This technical memorandum addresses a request from the City of Parkville to investigate current accident data and traffic signal warrants at the intersection of Route 45 and Julian Drive in the City of Parkville, Missouri.

Data Collection

Olsson Associates (Olsson) performed peak hour traffic data collection at the intersection of Route 45 and Julian Drive for a traffic impact study completed for QuikTrip. Counts were collected on May 4th, 2012 at Route 45 and Julian Drive from 6:00 to 9:00 AM and 3:00 to 6:00 PM. Traffic volumes from the approved traffic impact study were utilized to analyze conditions at the intersection as some of these volumes were conservatively balanced from the adjacent intersection of Route 45 and Route 9. Supplemental accident data was provided by the City for the years of 2012 through October 27th of 2015.

In the vicinity of the study intersection, Route 45 is an east/west four-lane undivided principal arterial roadway with a posted speed limit of 45 miles per hour (mph). At its intersection with Julian Drive it has one eastbound dedication auxiliary right-turn lane with a storage of approximately 75 feet and one westbound dedicated left-turn lane with a storage of approximately 160 feet.

Julian Drive is a north/south two-lane undivided local street. Julian Drive intersects with Route 45 as a "T-Intersection" on the south side of Route 45 and is stop controlled.

Traffic Signal Warrants

A traffic signal may be justified if traffic conditions meet any of eight signal warrants described in the 2009 Manual on Uniform Traffic Control Devices (MUTCD). The MUTCD provides criteria for conducting an engineering study to determine whether a traffic signal is appropriate at any particular intersection. Based on the data collected, Warrants 3 and 7 were reviewed within this memorandum. The criteria of Warrants 3 and 7 are described in the MUTCD as follows:

Warrant 3, Peak Hour

The Peak Hour signal warrant is intended for use at a location where traffic conditions are such that for a minimum of 1 hour of an average day, the minor-street traffic suffers undue delay when

entering or crossing the major street.

Warrant 7, Crash Experience

The Crash Experience signal warrant conditions are intended for application where the severity and frequency of crashes are the principal reason to consider installing a traffic control signal.

Warrant 3 was discussed and evaluated using information from the original traffic impact study at Route 45 and Julian Drive. The MUTCD offers provisions for roadways with speeds greater than 40 mph to analyze the intersection under 70% warranting conditions. Since the speed limit along Route 45 is 45 mph the MUTCD's provision for roadways with speed limits greater than 40 mph was applied.

Summary and Recommendations

Traffic volumes obtained with the traffic impact study were used to analyze the intersection under existing conditions and based on these volumes the intersection does not meet warrants for signalization. The traffic impact study also included anticipated development traffic which was added to background traffic. The results of the warrant analysis using the background peak hour of traffic volumes with the proposed development peak hour traffic volumes also indicates that the intersection is not expected to warrant a signal. See the attached **Appendix** for warrant analysis results.

The City of Parkville provided intersection accident data from 2012 through October of 2015. Based on the accident data provided, Warrant 7 was reviewed. Based on the data provided, four accidents were recorded during that period at the intersection and none of which were noted as correctable by a signal. Therefore, the intersection does not meet MUTCD criteria for Warrant 7. See the attached **Appendix** for crash data provided.

Since none of the above warrant criteria are currently met it is not recommended that a traffic signal be installed.



OBSERVER: Steve

DATE: 5/24/2012

COUNTY: PLATTE

STATE: MISSOURI

WEATHER: Clear, 80

DAY: THURSDAY

INTERSECTION OF: HIGHWAY 45 AT JULIAN DRIVE

| 15 Minute Time Period | <u>JULIAN DRIVE</u> NORTHBOUND | | | <u>JULIAN DRIVE</u> SOUTHBOUND | | | <u>HIGHWAY 45</u> EASTBOUND | | | <u>HIGHWAY 45</u> WESTBOUND | | |
|-----------------------------|-----------------------------------|---------|-------|-----------------------------------|---------|-------|--------------------------------|---------|-------|--------------------------------|---------|-------|
| | Left | Through | Right | Left | Through | Right | Left | Through | Right | Left | Through | Right |
| 6:00 - 6:15 | 0 | | 0 | | | | | 58 | 2 | 0 | 44 | |
| 6:15 - 6:30 | 0 | | 1 | | | | | 71 | 0 | 0 | 69 | |
| 6:30 - 6:45 | 0 | | 1 | | | | | 102 | 2 | 0 | 60 | |
| 6:45 - 7:00 | 1 | | 1 | | | | | 111 | 2 | 2 | 99 | |
| 7:00 - 7:15 | 1 | | 0 | | | | | 135 | 1 | 3 | 95 | |
| 7:15 - 7:30 | 1 | | 1 | | | | | 180 | 1 | 1 | 152 | |
| 7:30 - 7:45 | 0 | | 2 | | | | | 129 | 1 | 2 | 134 | |
| 7:45 - 8:00 | 2 | | 4 | | | | | 136 | 3 | 0 | 151 | |
| 8:00 - 8:15 | 1 | | 1 | | | | | 135 | 2 | 4 | 125 | |
| 8:15 - 8:30 | 0 | | 1 | | | | | 134 | 1 | 1 | 159 | |
| 8:30 - 8:45 | 1 | | 0 | | | | | 140 | 3 | 0 | 148 | |
| 8:45 - 9:00 | 2 | | 1 | | | | | 121 | 1 | 2 | 166 | |

| 15 Minute Time Period | <u>JULIAN DRIVE</u> NORTHBOUND | | | <u>JULIAN DRIVE</u> SOUTHBOUND | | | <u>HIGHWAY 45</u> EASTBOUND | | | <u>HIGHWAY 45</u> WESTBOUND | | |
|-----------------------------|-----------------------------------|---------|-------|-----------------------------------|---------|-------|--------------------------------|---------|-------|--------------------------------|---------|-------|
| | Left | Through | Right | Left | Through | Right | Left | Through | Right | Left | Through | Right |
| 3:00 - 3:15 | 7 | | 1 | | | | | 174 | 4 | 5 | 165 | |
| 3:15 - 3:30 | 4 | | 1 | | | | | 148 | 7 | 3 | 153 | |
| 3:30 - 3:45 | 11 | | 2 | | | | | 152 | 7 | 8 | 124 | |
| 3:45 - 4:00 | 4 | | 3 | | | | | 157 | 6 | 5 | 206 | |
| 4:00 - 4:15 | 4 | | 2 | | | | | 136 | 4 | 3 | 157 | |
| 4:15 - 4:30 | 7 | | 3 | | | | | 146 | 6 | 6 | 201 | |
| 4:30 - 4:45 | 6 | | 2 | | | | | 171 | 6 | 5 | 209 | |
| 4:45 - 5:00 | 8 | | 0 | | | | | 163 | 8 | 3 | 186 | |
| 5:00 - 5:15 | 4 | | 1 | | | | | 153 | 4 | 0 | 235 | |
| 5:15 - 5:30 | 3 | | 0 | | | | | 175 | 5 | 4 | 222 | |
| 5:30 - 5:45 | 6 | | 5 | | | | | 161 | 11 | 3 | 201 | |
| 5:45 - 6:00 | 7 | | 3 | | | | | 156 | 4 | 0 | 235 | |

Note: Through Volumes Adjusted Upwards to Balance Volumes Between Intersections

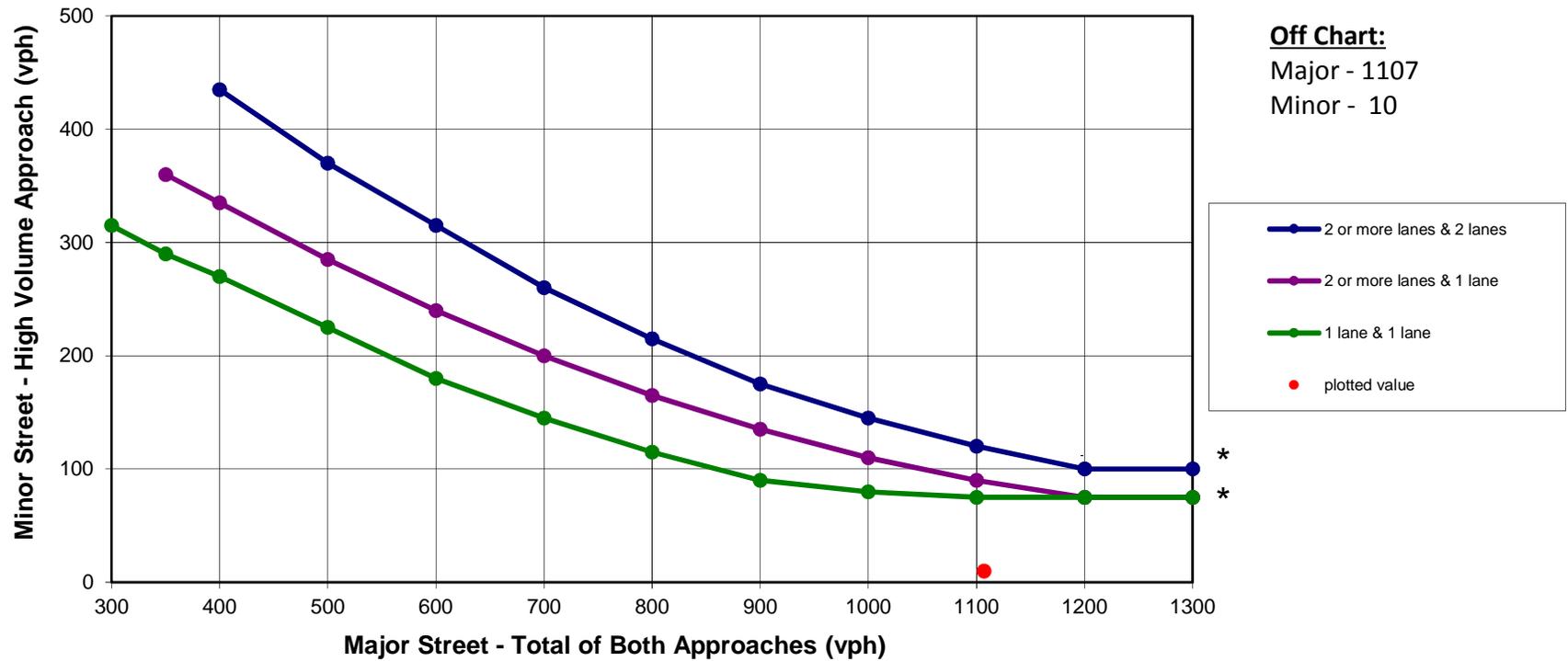
| Accident date | Time | Location | injuries | contributing circumstances | Report # |
|--------------------------------------|--------|--|----------|--|----------|
| None in 2015 at that location | | | | | |
| 10/15/2014 | 6:35am | Eastbound 45 Hwy, 69' after Julian Drive | None | Following too close, deer crossing roadway | 14-1046 |
| 3/12/2014 | 8:15am | Westbound 45 Hwy, 900' before 9 Hwy | None | None, car VS deer MVA | 14-0238 |
| 8/26/2013 | 8:49am | Westbound 45 Hwy, 21' after Julian Drive | Two | Following too close, backed-up traffic from red light at 9 Hwy | 13-1668 |
| 11/13/2013 | 9:36am | Eastbound 45 Hwy, 10' after Julian Drive | None | None, car VS deer MVA | 13-1980 |
| None in 2012 at that location | | | | | |

All accidents reported at the location on 45 Highway in the area of Julian Drive were investigated by the Parkville, Missouri PD. The information gathered was verified from the Missouri State Highway Patrol crash reporting division's website.

JJJ 108
 10-27-15
 Captain Jon Jordan

Existing AM Peak Hour Volume Warrant Missouri Route 45 & Julian Drive

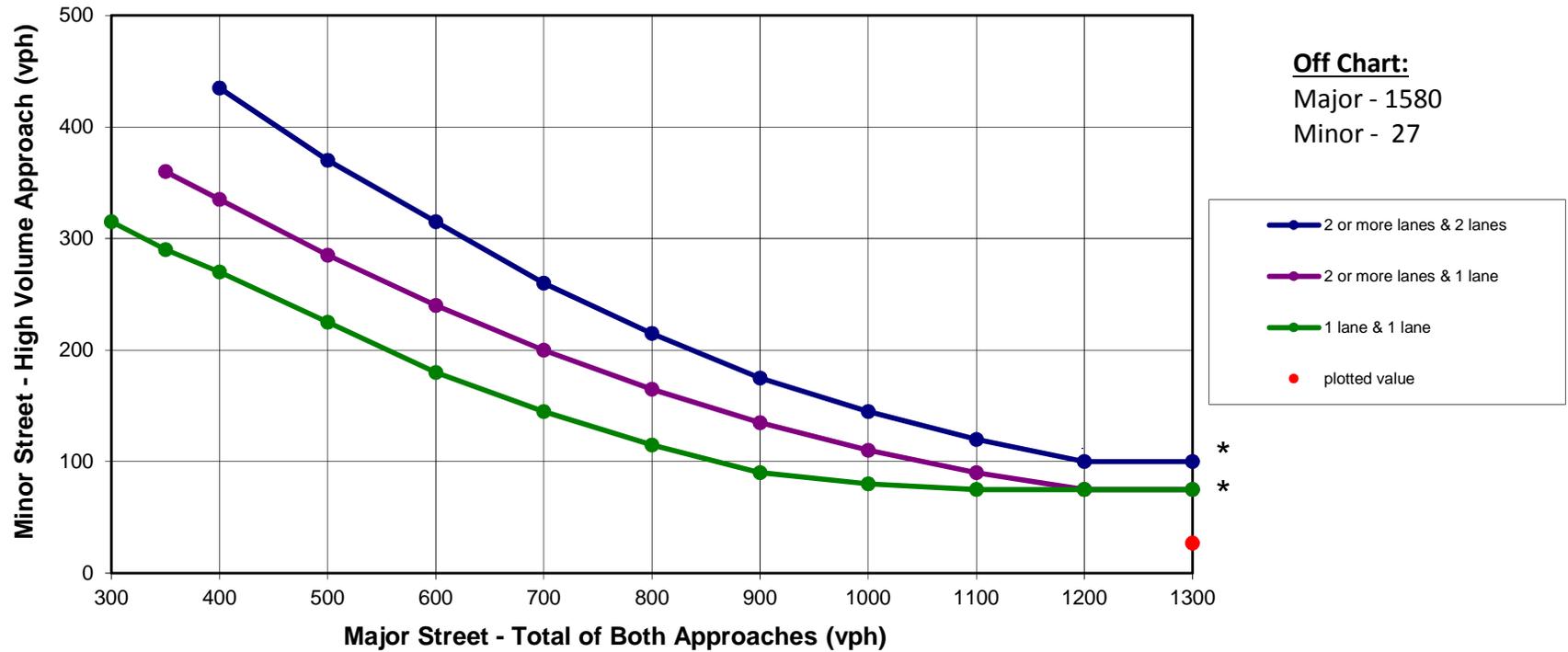
(Community less than 10,000 population or above 40mph on major street)



*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.

Existing PM Peak Hour Volume Warrant Missouri Route 45 & Julian Drive

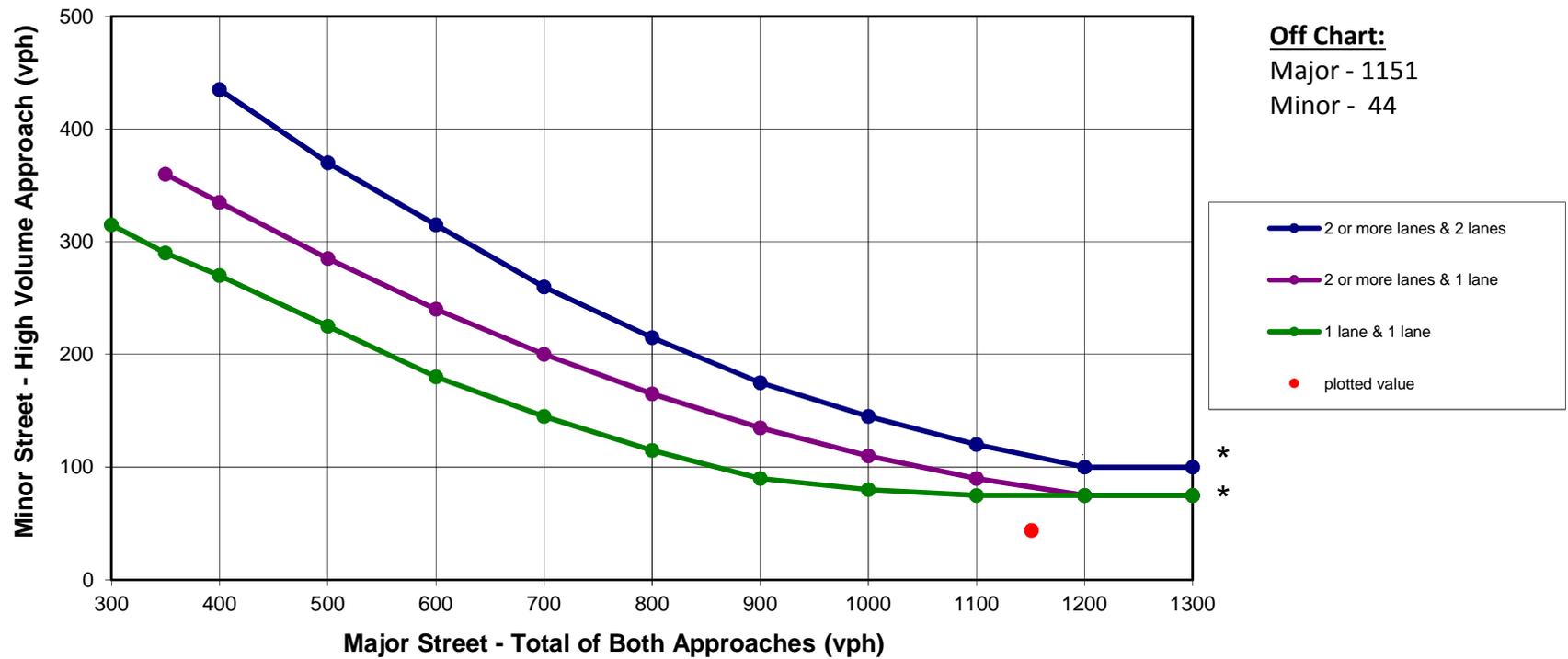
(Community less than 10,000 population or above 40mph on major street)



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

Existing + Dev (w D3) AM Peak Hour Volume Warrant Missouri Route 45 & Julian Drive

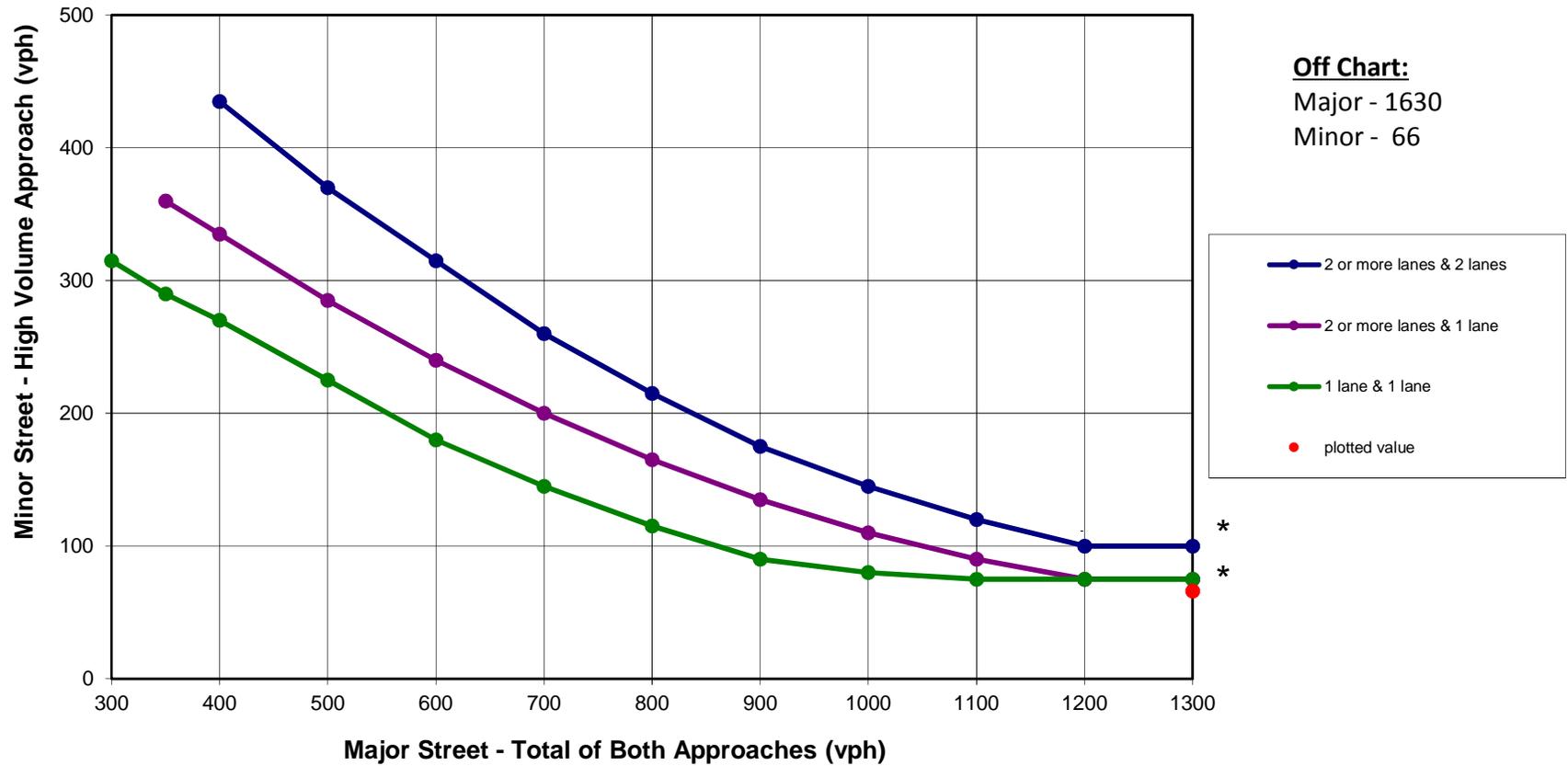
(Community less than 10,000 population or above 40mph on major street)



*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.

Existing + Dev (w D3) PM Peak Hour Volume Warrant Missouri Route 45 & Julian Drive

(Community less than 10,000 population or above 40mph 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.