



April 24, 2023

TO: Public Safety & Transportation Committee  
 THROUGH: Carl Goldsmith, Director of Public Works  
 FROM: Mike Barbier, Civil Engineer II  
 SUBJECT: **Traffic Study – Westmore & Washington**

## Background

In November of 2022, the Committee concurred with Staff's recommendation to investigate the safety concerns at the intersection of Westmore-Meyers Road at Washington Boulevard. The Village's traffic consultant (KLOA) has delivered a Traffic Safety Evaluation to the Village that includes analysis of the existing condition as well as recommendations for improvements. The narrative portion of the Traffic Safety Evaluation can be found in Attachment C.

## Traffic Safety Evaluation Report Summary

### *Crash Analysis*

The primary cause of accidents at the intersection is the lack of exclusive left-turn lanes on Westmore-Meyers Road. In the existing condition there are no exclusive left-turn lanes, negative offset for opposing left turn movements, and no protected left turn phases. This configuration leads to angle crashes, rear ends, and sideswipes.

When there are two opposing left turn movements, the negative offset blocks the view of both left turning drivers. This contributes to delay by vehicles missing gaps in oncoming traffic and angle crashes from limited visibility of oncoming vehicles.

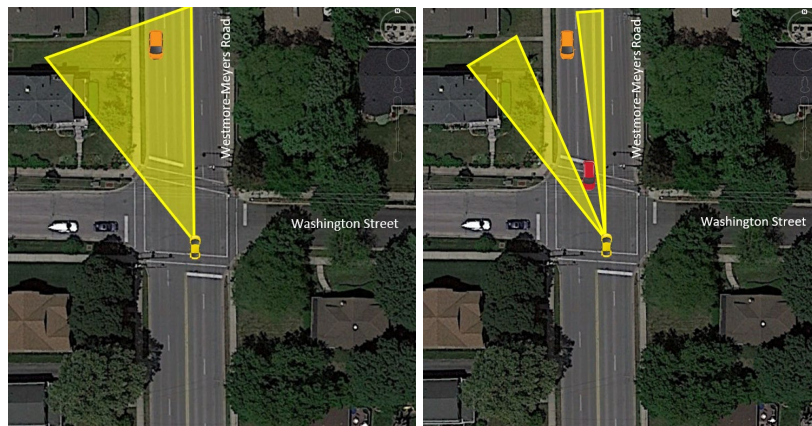


Figure 1: Lack of visibility with negative offset left turn lanes.

The inside lanes of Westmore-Meyers are both shared thru-left turn lanes. This means that when a vehicle is stopped, waiting to make a left turn, the vehicles wanting to go through the intersection in the inside lane must either come to a stop or change lanes. This leads to rear end crashes and sideswipe collisions.



Figure 2: Conflicts created from not having an exclusive left turn lane.

Below is the Crash Summary Table that was provided in the report.

Table 1

WESTMORE-MEYERS ROAD WITH WASHINGTON BOULEVARD – CRASH SUMMARY

Year	Type of Crash								Crash Severity		
	Angle	Head On	Object	Rear End	Sideswipe	Turning	Other	Total Crashes	Property Damage Only	Injury	Fatality
2016	0	0	1	2	0	2	0	5	1	4	--
2017	0	0	1	0	0	3	0	4	4	--	--
2018	1	0	2	5	1	4	0	13	7	6	--
2019	0	0	1	1	0	2	0	4	3	1	--
2020	0	0	1	0	1	1	1	4	1	3	--
2021	0	0	0	1	2	0	0	3	2	1	--
2022	0	0	2	1	0	4	0	7	7	--	--
<b>Total</b>	<b>1</b>	<b>0</b>	<b>8</b>	<b>10</b>	<b>4</b>	<b>16</b>	<b>1</b>	<b>40</b>	<b>25</b>	<b>15</b>	<b>--</b>
<b>Avg</b>	<b>&lt;1.0</b>	<b>&lt;1.0</b>	<b>1.1</b>	<b>1.4</b>	<b>&lt;1.0</b>	<b>2.3</b>	<b>&lt;1.0</b>	<b>5.7</b>	<b>3.6</b>	<b>2.1</b>	<b>--</b>

This crash pattern, as stated before, is consistent with the intersection not having exclusive left turn lanes:

- Left Turning Crashes = 40%
- Rear Ends = 20%
- Sideswipe = 10%

When we look at the Westmore-Meyers corridor, we find that the highest crash frequencies and highest injury crash frequencies occur at the intersections that lack exclusive left turn lanes.

Intersection of Westmore-Meyers At:	AM & PM Peak Hr. Volumes		Peak Hr. NB & SB Left Turns			Crash History (2017-2021)		
	Total	Relative to Madison	Total	Relative to Madison		Total Injury Crashes	PDO	TOTAL CRASHES
Wilson Avenue**	3796	104%	143	44%		6	9	15
Jackson Street	3425	94%	124	38%		18	21	39
<b>Madison Street**</b>	<b>3660</b>	-	<b>325</b>	-		<b>8</b>	<b>11</b>	<b>19</b>
Washington Boulevard	2951	81%	72	22%		11	17	28
Maple Street	2928	80%	231	71%		10	15	25

\*\*Denotes exclusive left turn lanes for Northbound and Southbound at intersection

Table 2: Crash History (2017-2021) in the Westmore-Meyers corridor

### *Alternatives Analysis*

The alternatives considered were:

1. Provision of a lead phase for either the northbound or southbound approach.
  - Similar to the existing conditions on Westmore-Meyers Road at Jackson Street and Maple Street.
2. Prohibition of left-turn movements during the peak periods.
3. Converting Washington Boulevard (west leg) to one-way eastbound traffic.
4. The restriping of Westmore-Meyers Road to provide exclusive left-turn lanes with zero offset on both approaches.

Restriping Westmore-Meyers Road (Alternative 4) was determined to be the preferred alternative to carry forward for further analysis as it allows for the provision of:

- An exclusive left turn lane
- A zero offset for opposing left turn movements
- A protected phase for left turning vehicles

### *Preferred Alternative*

The preferred alternative is the restriping of Westmore-Meyers Road to 1 southbound lane, 1 turn lane, and 2 northbound lanes from St. Charles Road to south of Jackson Street. A schematic of this can be found in Attachment A. Rather than being a standalone intersection improvement, this project would require a corridor wide restriping and would also yield corridor-wide benefits.

The proposed corridor-wide safety benefits would include:

Location (South to North)	Added Safety Feature	Crash Modification Factor (& Crash Reduction)
Eastgate Shopping Center (DMV)	Left turn lane into facility	0.73 (27% Crash Reduction) <sup>2</sup>
Jackson Street (Signalized)	Exclusive left-turn lane for NB & SB	0.81 (19% Crash Reduction) <sup>1</sup>
	Zero Offset for left turning vehicles	0.74 (26% Crash Reduction) <sup>2</sup>
	Protected left turn phases for NB & SB	0.84 (16% Crash Reduction) <sup>1</sup>
Washington Boulevard (Signalized)	Exclusive left-turn lane for NB & SB	0.81 (19% Crash Reduction) <sup>1</sup>
	Zero Offset for left turning vehicles	0.74 (26% Crash Reduction) <sup>2</sup>
	Protected left turn phases for NB & SB	0.84 (16% Crash Reduction) <sup>1</sup>
Woodrow Avenue	SB left turn lane	0.73 (27% Crash Reduction) <sup>2</sup>
Division Street	SB left turn lane	0.73 (27% Crash Reduction) <sup>2</sup>
Illinois Prairie Path Crossing	Refuge Island	0.29 (71% Crash Reduction) <sup>2</sup>
North Broadway Street	SB left turn lane	0.73 (27% Crash Reduction) <sup>2</sup>
Maple Street (Signalized)	Exclusive left-turn lane for NB & SB	0.81 (19% Crash Reduction) <sup>1</sup>
	Zero Offset for left turning vehicles	0.74 (26% Crash Reduction) <sup>2</sup>
	Protected left turn phases for NB & SB	0.84 (16% Crash Reduction) <sup>1</sup>
Emerson Avenue	SB left turn lane	0.73 (27% Crash Reduction) <sup>2</sup>
Kenilworth Avenue	SB left turn lane	0.73 (27% Crash Reduction) <sup>2</sup>
All other areas along the segment	Having 3 lanes of traffic rather than 4	0.81 (19% Crash Reduction) <sup>2</sup>
1 = Highway Safety Manual 1st Edition		
2 = IDOT HSM Crash Prediction Tool		

Table 3: Crash Modification Factors for the Proposed Alternative in the Westmore-Meyers corridor

These significant crash reduction factors at a large number of locations makes this alternative attractive to consider and will result in more favorable consideration for Federal Funding, if we seek to pursue it.

The full capacity analysis table can be found in Attachment B. Because the preferred alternative includes protected left-turn phases for northbound and southbound Westmore-Meyers Road, this does introduce some delay to the intersection. This is due to the fact that while the left turning vehicles have a green or yellow arrow, no other movements at the intersection are permitted. This additional safety measure for the left turning vehicles comes at a tradeoff to overall delay.

In the table below, we can see the overall intersection Delay & Level of Service (LOS) in the existing condition and in the proposed alternative. It is worth noting that all of these intersections still function at a Level of Service A or B in both the existing and proposed scenarios. That is to say that driver expectation on Delay & LOS will still be met.

Delay & LOS on Westmore-Meyers		Overall Delay (sec) & LOS at Each Intersection				Corridor-wide Overall Int Delay	Change in delay
		Maple	Washington	Madison	Jackson		
Existing	AM Peak Hour	B - 11.1	A - 9.5	B - 13.2	A - 7.6	41.4 sec	
	PM Peak Hour	A - 9.2	A - 6.2	B - 13.1	A - 6.6	35.1 sec	
Restriping Alternative	AM Peak Hour	B - 12.7	B - 14.8	B - 15.2	B - 13.7	56.4 sec	15.0 sec
	PM Peak Hour	B - 14.4	A - 8.3	B - 12.8	B - 14.4	49.9 sec	14.8 sec

Table 4: Intersection LOS in Proposed Re-Striping area

If we look at the performance for a vehicle traveling the full length of the proposed re-striped, corridor in the northbound and southbound directions, the tables below shows the delays at each intersection and for the corridor overall.

Northbound Travel on Westmore-Meyers		Northbound thru movement delays				Overall Delay	Change in delay
		Jackson	Madison	Washington	Maple		
Existing	AM Peak Hour	3.0 sec	7.2 sec	6.6 sec	9.1 sec	25.9 sec	
	PM Peak Hour	2.2 sec	5.0 sec	2.7 sec	6.8 sec	16.7 sec	
Restriping Alternative	AM Peak Hour	5.5 sec	7.3 sec	12.5 sec	3.0 sec	28.3 sec	2.4 sec
	PM Peak Hour	4.7 sec	4.2 sec	6.1 sec	5.8 sec	20.8 sec	0.0 sec

Table 5: Delay for Northbound travel through Proposed Re-Striping area

Southbound Travel on Westmore-Meyers		Southbound thru movement delays				Overall Delay	Change in delay
		Maple	Washington	Madison	Jackson		
Existing	AM Peak Hour	6.4 sec	3.5 sec	8.4 sec	3.9 sec	22.2 sec	
	PM Peak Hour	1.8 sec	3.6 sec	5.5 sec	4.8 sec	15.7 sec	
Restriping Alternative	AM Peak Hour	17.2 sec	10.7 sec	13.4 sec	15.6 sec	56.9 sec	34.7 sec
	PM Peak Hour	14.7 sec	5 sec	7.8 sec	20.4 sec	47.9 sec	32.2 sec

Table 6: Delay for Southbound travel through Proposed Re-Striping area

For a vehicle traveling in the northbound direction there is negligible change from the existing conditions, but the additional delay for a southbound trip is in the range of 30 – 35 seconds.

While this is added delay to the existing operations on Westmore-Meyers Road, the roadway functions similar to or even better than Main Street. In the following tables, we compare the existing delays on Westmore-Meyers Road, the Proposed Condition, and the existing delays on Main Street for the segment of Maple to Roosevelt Road.

Northbound Travel Roosevelt thru Maple		Northbound thru movement delays									Overall Delay	Diff from Existing W-M
		Morris	Edward	GE H.S.	Wilson	Jackson	Madison	Washington	Hickory	Maple		
W-M Existing	AM Peak Hour	-	-	-	2.3 sec	3.0 sec	7.2 sec	6.6 sec	-	9.1 sec	28.2 sec	
	PM Peak Hour	-	-	-	2.5 sec	2.2 sec	5.0 sec	2.7 sec	-	6.8 sec	19.2 sec	
W-M Pref Alternative	AM Peak Hour	-	-	-	2.8 sec	5.5 sec	7.3 sec	12.5 sec	-	3.0 sec	31.1 sec	2.9 sec
	PM Peak Hour	-	-	-	3.2 sec	4.7 sec	4.2 sec	6.1 sec	-	5.8 sec	24.0 sec	4.8 sec
Existing Main Street	AM Peak Hour	4.8 sec	3.4 sec	0.7 sec	10.9 sec	-	13.5 sec	-	2.0 sec	12.8 sec	48.1 sec	19.9 sec
	PM Peak Hour	10.1 sec	5.1 sec	1.2 sec	12.3 sec	-	8.8 sec	-	1.5 sec	22.2 sec	61.2 sec	42.0 sec

Table 7: Delay for Northbound travel, from Roosevelt Road through Maple Street

Southbound Travel Maple to Roosevelt Road		Southbound thru movement delays									Overall Delay	Diff from Existing W-M
		Maple	Hickory	Washington	Madison	Jackson	Wilson	GE H.S.	Edward	Morris		
W-M Existing	AM Peak Hour	6.4 sec	-	3.5 sec	8.4 sec	3.9 sec	5.2 sec	-	-	-	27.4 sec	
	PM Peak Hour	1.8 sec	-	3.6 sec	5.5 sec	4.8 sec	3.9 sec	-	-	-	19.6 sec	
W-M Pref Alternative	AM Peak Hour	17.2 sec	-	10.7 sec	13.4 sec	15.6 sec	9.9 sec	-	-	-	66.8 sec	39.4 sec
	PM Peak Hour	14.7 sec	-	5.0 sec	7.8 sec	20.4 sec	8.6 sec	-	-	-	56.5 sec	36.9 sec
Existing Main Street	AM Peak Hour	14.7 sec	2.5 sec	-	17.0 sec	-	11.8 sec	1.2 sec	2.8 sec	1.9 sec	51.9 sec	24.5 sec
	PM Peak Hour	24.1 sec	2.8 sec	-	21.9 sec	-	10.0 sec	3.1 sec	4.8 sec	3.2 sec	69.9 sec	50.3 sec

Table 8: Delay for Southbound travel, from Maple Street to Roosevelt Road

The Northbound travel on Westmore-Meyers Road remains significantly more efficient than Main Street. The Southbound operations on Westmore-Meyers Road in the proposed condition are similar to Main Street - The AM delay on Main is similar to the PM delay on Westmore-Meyers and vice versa.

### Beyond the Preferred Alternative

For the purposes of this Traffic Safety Evaluation, we had to necessarily limit the number of options to analyze. The “Preferred Alternative” concept is flexible and lends itself to multiple different sub-options. This is especially important if the Village feels the additional delays, as presented for the Preferred Alternative, are too impactful to the community.

Options in the left-turn treatment:

- Provide protected-permitted left turn phases (as shown in Preferred Alternative)
- Provide permitted only, flashing yellow arrow, left turn phase.
  - No delay from green & yellow left turn arrows
  - Operations will be significantly more efficient than in the Preferred Alternative



Options in the improvement length: “Shorter the segment, lower the delays”

- St. Charles Road through the Maple Street intersection
- St. Charles Road through the Washington Boulevard intersection
- St. Charles Road to the Madison Street intersection
- St. Charles Road through the Jackson Street intersection

Geometric options at specific locations:

- Widening Westmore-Meyers to a 5-lane cross section some sections to provide exclusive left turns and maintain 2 lanes of southbound traffic.
  - Madison through Jackson
  - Madison through Wilson

These options could be investigated during a Phase I Preliminary Engineering Study or an additional traffic study and would need to incorporate Committee feedback.

## **Next Steps**

If the Village pursues the preferred alternative as a project, there are two options for the scope and process. KLOA has provided cost estimates for each approach:

- A. Localized improvements only (Minimum work required to facilitate restriping alternative)
  - 100% Village Funds
  - Only modify the mast arms and poles required for the restriped configuration
    - At the intersections of Jackson, Washington, and Maple
  - Remove the existing striping and place the new striping
  - The timeline depends largely on how fast the Village would like to move
- B. Traffic Signal Modernizations throughout the corridor
  - Use Village Funds or apply for Federal Funding (STP Local and/or HSIP)
  - Fully modernize all of the traffic signals in, and adjacent to, the corridor
    - Jackson, Washington, Maple, Madison, and St. Charles Road
  - Remove the existing striping and place the new striping
  - The next STP call is in the Fall of 2023, for federal fiscal years 2025-2029
    - This project’s construction year would likely be 2027 to 2029

Below are the cost estimates for the Preferred Alternative as presented in the Report.

Localized Improvements Only		Corridor Signal Modernizations	
Work Item	Price	Work Item	Price
Restriping	\$75,000	Restriping	\$75,000
Traffic Signal Modifications		Traffic Signal Modernization	
Jackson Street	\$80,000	Jackson Street	\$375,000
Washington Boulevard	\$80,000	Madison Street	\$375,000
Maple Street	\$80,000	Washington Boulevard	\$375,000
		Maple Street	\$375,000
		St. Charles Road	\$375,000
Subtotal	\$315,000	Subtotal	\$1,950,000
Mobilization 10%	\$30,000	Mobilization 10%	\$195,000
Traffic Control 10%	\$30,000	Traffic Control 10%	\$195,000
<b>TOTAL</b>	<b>\$375,000</b>	<b>TOTAL</b>	<b>\$2,340,000</b>
		<b><i>If Federally Funded at 70/30</i></b>	
		Village of Lombard Share	<b>\$702,000</b>
		Federal Share	\$1,638,000

Table 9: Construction Cost Estimates

## Recommendation

Staff recommends pursuing an interim improvement for the intersection of Westmore-Meyers Road at Washington Boulevard in the form of a protected left turn phase for Northbound vehicles. This will add a component of safety to the intersection as well as provide a level of consistency for the signalized intersections along Westmore-Meyers Road. This treatment is estimated to cost approximately \$30,000.

Beyond the interim improvement, Staff will engage in continued evaluation of crashes & potential improvements going forward and will provide any future recommendations to this Committee.