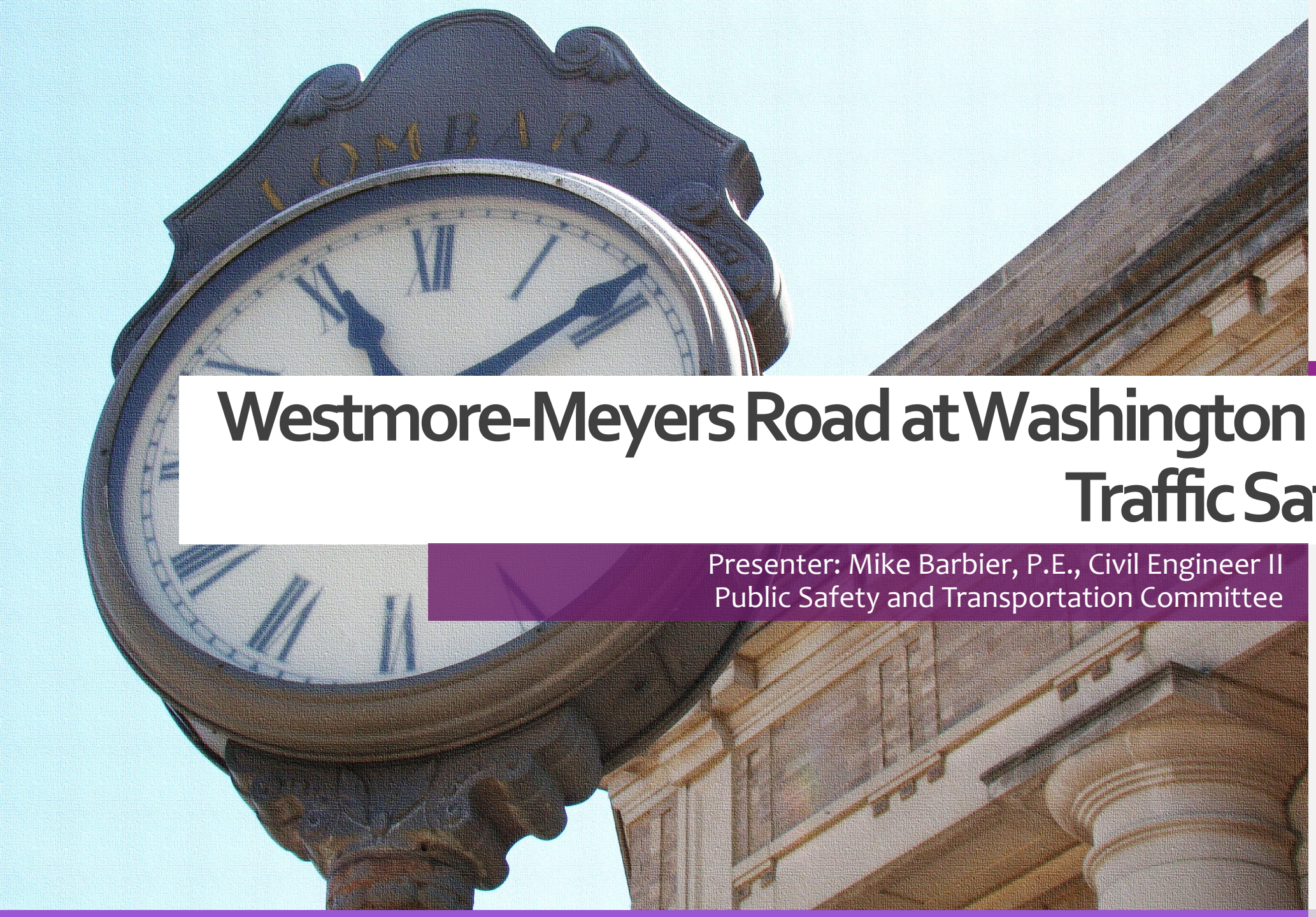


Westmore-Meyers Road at Washington Boulevard Traffic Safety Study

Presenter: Mike Barbier, P.E., Civil Engineer II
Public Safety and Transportation Committee

Overview

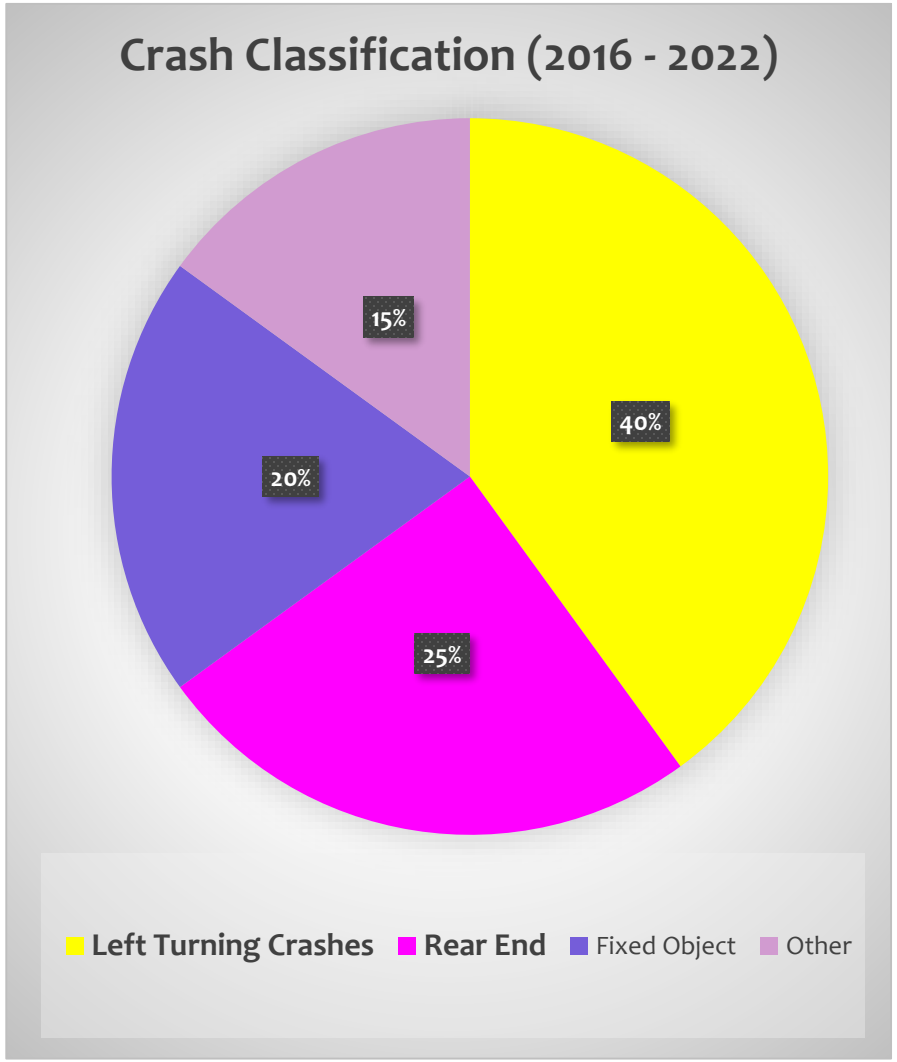
1. **Crash History and Existing Conditions**
   - Cover the existing safety issues
2. **Investigation of Solutions**
   - Safety countermeasures that were considered
3. **Preferred Alternative from Study**
   - The Concept Developed from the Study
   - The Benefits of the Alternative
   - The Operational Impacts (vehicle delays)
   - The Construction Cost Estimate
4. **Possible Next Steps**
5. **Questions & Options that still remain**
6. **Staff Recommendations**

Crash History

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	--	--
Total	**1**	**0**	**8**	**10**	**4**	**16**	**1**	**40**	**25**	**15**	--
Avg	**<1.0**	**<1.0**	**1.1**	**1.4**	**<1.0**	**2.3**	**<1.0**	**5.7**	**3.6**	**2.1**	--

- Left turning movements top reason for crashes (**40%** of total crashes)
  - Drivers commented that they could not see the oncoming vehicle
- Left turning movements are also contributing factor in rear ends & sideswipes
  - Rear Ends = **25%** of the total crashes
  - Sideswipes = **10%** of the total crashes

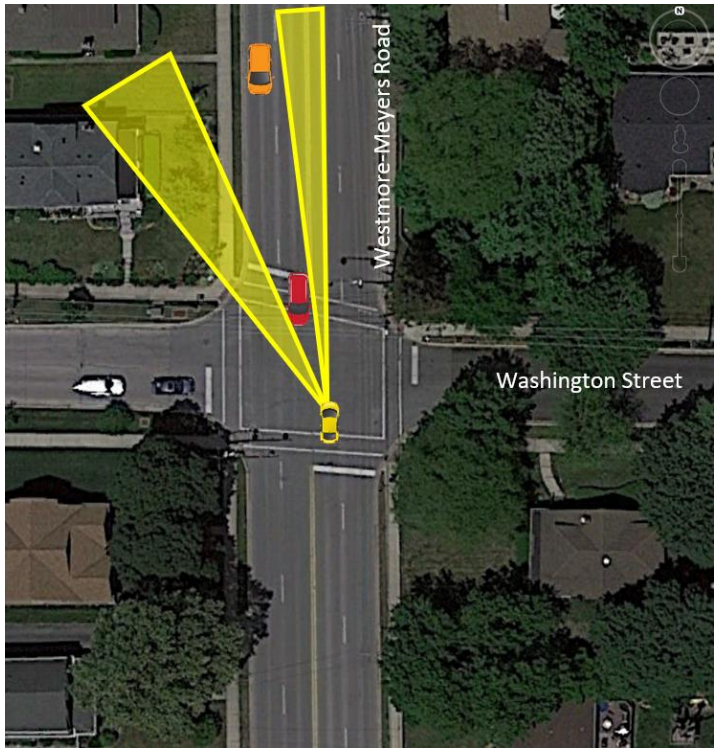


Existing Conditions – Negative Offset

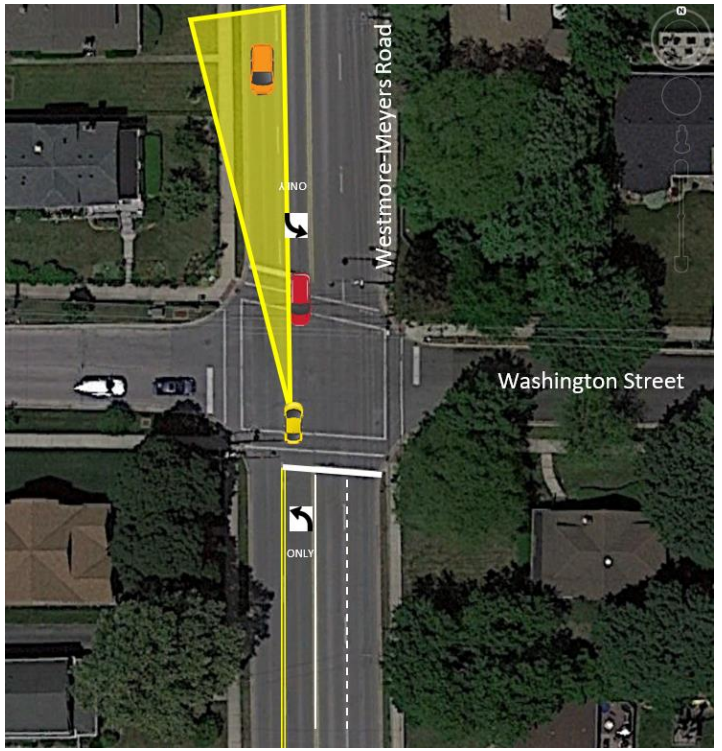
In the existing conditions there is “negative offset” for the left turns.

This means that 2 opposing left turn vehicles will block each other’s view.

No opposing left turn vehicle, the Yellow car can see the Orange car.



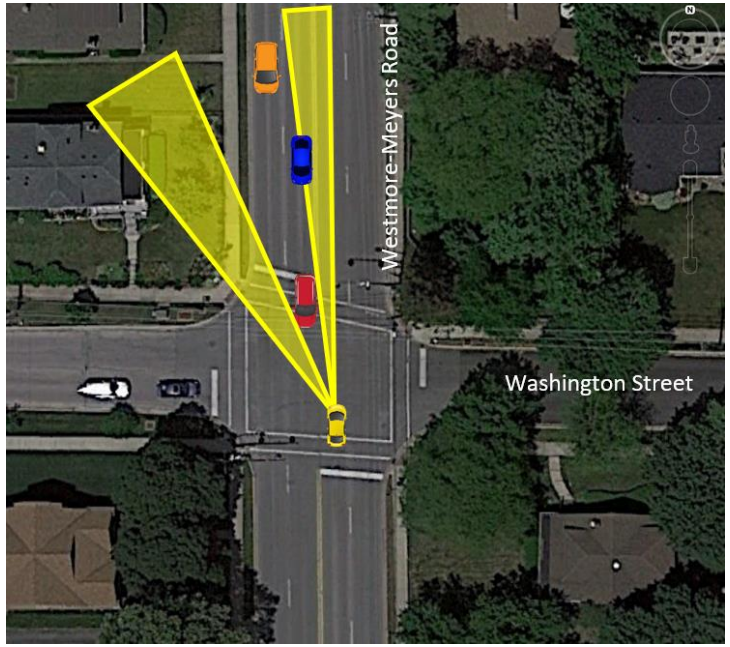
With an opposing left turn vehicle, the Yellow car CANNOT see the Orange car.



By aligning the left turning vehicles (creating ‘zero offset’), visibility is improved.

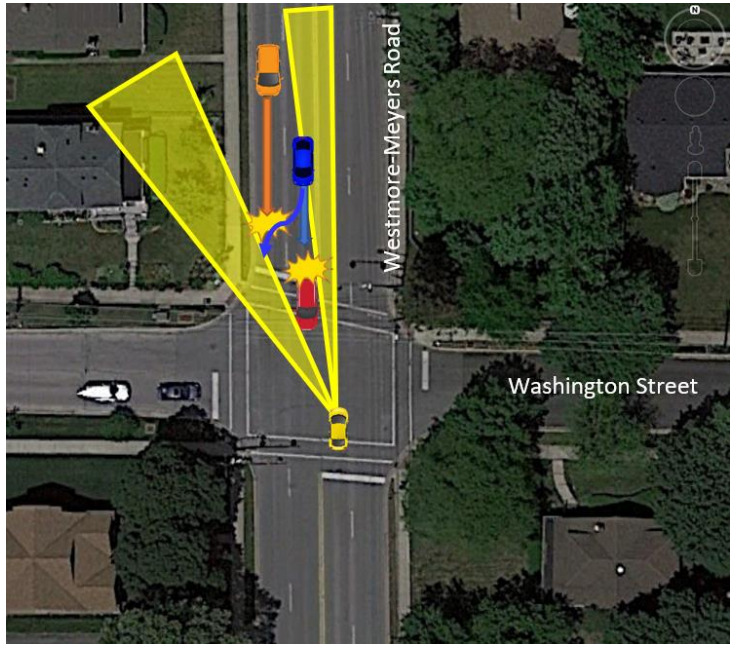
Existing Conditions – Exclusive Left Turn Lane

With no exclusive left turn lane, thru movement vehicles in the inside lane will be blocked by left turning vehicles.



The Blue car wants to travel straight in the inside lane,

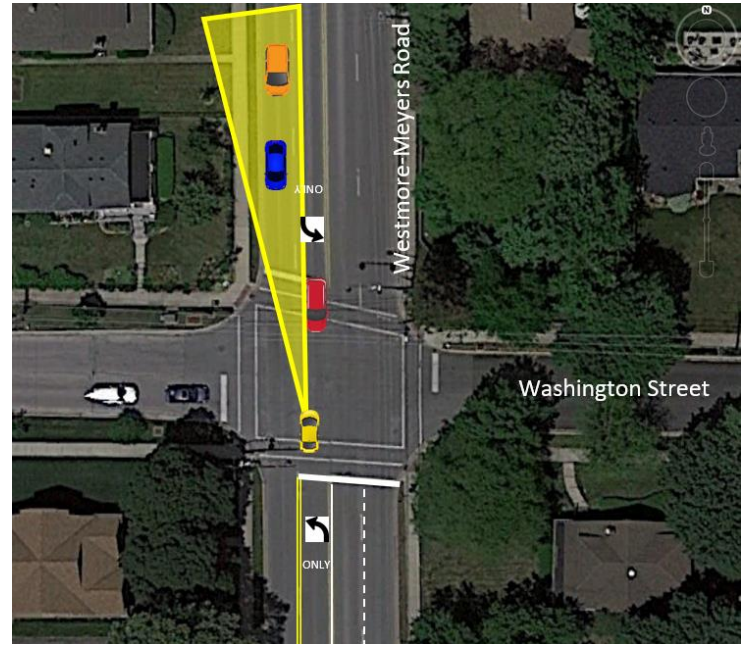
but there is a left turning vehicle (Red vehicle) blocking that path.



1) The Blue car may rear end the Red if she is not expecting the Red vehicle to be stopped.

OR

2) The Blue car may change lanes and sideswipe or create a rear end collision with the Orange car.



With an exclusive left turn lane, left turning vehicles are separated from the thru movements.

No need for a thru movement to change lanes and minimal chance to rear end a left turning vehicle.

Westmore-Meyers Corridor Crashes

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
Madison Street**	**3660**	-	**325**	-	**8**		**11**	**19**
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

The intersections with the lowest crash frequency are those with exclusive left turn lanes & protected left turn phases for the northbound and southbound direction. (Wilson & Madison)

- Jackson Street has no exclusive left turn lanes, but provides a *southbound* protected left turn phase
- Maple Street has no exclusive left turn lanes, but provides a *northbound* protected left turn phase
- Washington Blvd has no exclusive left turn lanes and no protected left turn phases

Corridor-wide Issue

The issue of not having a zero offset, exclusive left-turn lane is most easily seen at the signalized intersections of:

- Jackson Street,
- Washington Blvd, and
- Maple Street.

However, vehicles must turn left from the inside thru lane throughout the corridor.

Many of the of unsignalized intersections, business entrances, and residential properties are still required to make a left turn from the inside thru lane. Which factors into:

- Rear End collisions and
- Sideswipes from lane changes

Location (South to North)	Issue
Eastgate Shopping Center (DMV)	No SB left turn lane into facility
Jackson Street (Signalized)	No exclusive left-turn lane NB or SB
	Negative Offset for left turning vehicles
	Only SB protected left turn phase
Washington Boulevard (Signalized)	No exclusive left-turn lane NB or SB
	Negative Offset for left turning vehicles
	No protected left turn phase
Woodrow Avenue	No SB left turn lane
Division Street	No SB left turn lane
Illinois Prairie Path Crossing	No opportunity for a refuge island
North Broadway Street	No SB left turn lane
Maple Street (Signalized)	No exclusive left-turn lane NB or SB
	Negative Offset for left turning vehicles
	Only NB protected left turn phase
Emerson Avenue	No SB left turn lane
Kenilworth Avenue	No SB left turn lane
All other areas along corridor	Must make left-turn from a thru lane

Investigation of Solutions

1. **Reduce or eliminate left-turn movements**
   - Fewer left turns = fewer crashes because of left turns

   A. Prohibit left-turns during the peak periods*

   B. Convert Washington (west leg) to a one-way eastbound*

2. **Add a protected left-turn phase for either northbound or southbound***
   - Similar to Westmore-Meyers at Jackson and at Maple
   - Limited effectiveness as thru movement vehicles will also occupy the inside lane

3. **Create zero offset, exclusive left-turn lanes, with protected left-turn phases**

   A. Widen the roadway to a 5-lane cross section

   B. Perform a "Road Diet" to reduce it to a 3-lane cross section

   C. Restripe Westmore-Meyers and keep a 4-lane cross section*

* = Options evaluated in Report

Study Recommendation – Preferred Alternative

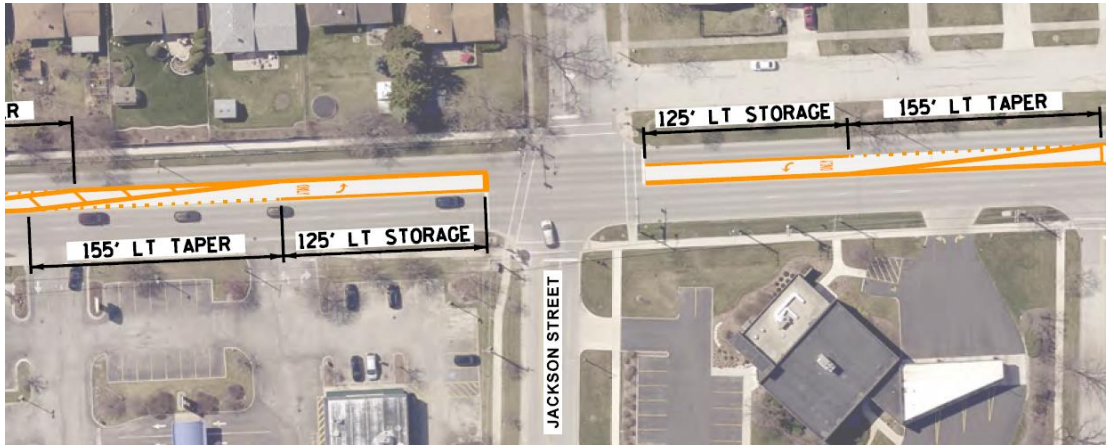
Restripe Westmore-Meyers Road

Adding zero offset, exclusive left turn lanes

- Allows all existing turning movements
- Increased safety related to left turn movements
  - Zero Offset Left-Turn Lanes at intersections
    - Increased field of vision for left turning vehicles
  - Exclusive Left-Turn Lanes
    - Reduces Rear-Ends and Sideswipes by removing left turning vehicles from thru traffic
  - Ability to provide Left-Turn Phases at intersections
    - Would allow a significant number of NB & SB left turning vehicles to turn on a protected arrow
- Allows for Corridor-wide Safety Improvements

Preferred Alternative - Restriping

- At the signalized intersections, this provides zero offset, exclusive left-turn lanes.



Preferred Alternative - Restriping

- Starting at the North, there is only 1 lane of traffic entering Southbound Westmore-Meyers at the intersection of St. Charles Road.
- This Alternative would accept that 1 lane of traffic in the outside lane and continue as 1 lane southbound down the corridor.
- The existing "Southbound Inside lane" becomes the space for a turn lane at intersections and a Two-Way Left Turn Lane for residential and business driveways.
- Northbound remains as 2 lanes.

Preferred Alternative - Restriping

Preferred Alternative - Restriping

Corridor-wide Benefits

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)[2]
Jackson Street (Signalized)	Exclusive left-turn lane for NB & SB	0.81 (19% Crash Reduction)[1]
	Zero Offset for left turning vehicles	0.74 (26% Crash Reduction)[2]
	Protected left turn phases for NB & SB	0.84 (16% Crash Reduction)[1]
Washington Boulevard (Signalized)	Exclusive left-turn lane for NB & SB	0.81 (19% Crash Reduction)[1]
	Zero Offset for left turning vehicles	0.74 (26% Crash Reduction)[2]
	Protected left turn phases for NB & SB	0.84 (16% Crash Reduction)[1]
Woodrow Avenue	SB left turn lane	0.73 (27% Crash Reduction)[2]
Division Street	SB left turn lane	0.73 (27% Crash Reduction)[2]
Illinois Prairie Path Crossing	Refuge Island	0.29 (71% Crash Reduction)[2]
North Broadway Street	SB left turn lane	0.73 (27% Crash Reduction)[2]
Maple Street (Signalized)	Exclusive left-turn lane for NB & SB	0.81 (19% Crash Reduction)[1]
	Zero Offset for left turning vehicles	0.74 (26% Crash Reduction)[2]
	Protected left turn phases for NB & SB	0.84 (16% Crash Reduction)[1]
Emerson Avenue	SB left turn lane	0.73 (27% Crash Reduction)[2]
Kenilworth Avenue	SB left turn lane	0.73 (27% Crash Reduction)[2]
All other areas along the segment	Having 3 lanes of traffic rather than 4	0.81 (19% Crash Reduction)[2]

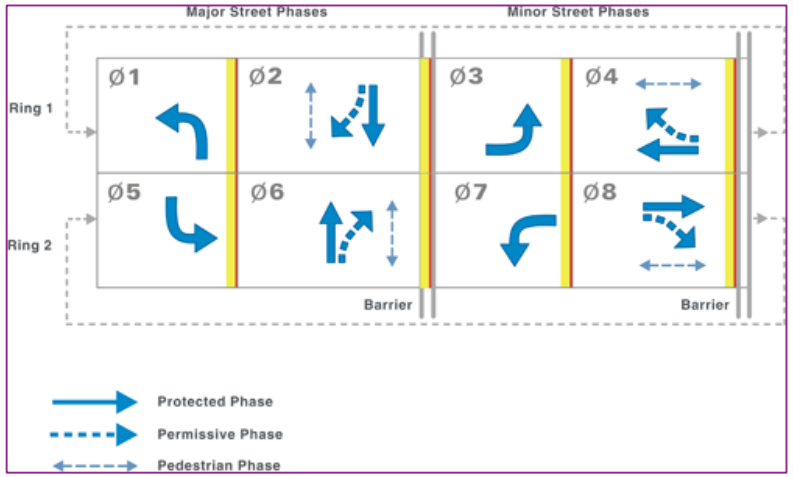
1 = Highway Safety Manual 1st Edition
2 = IDOT HSM Crash Prediction Tool

*Note: There is some overlapping of the CMFs at the signalized intersections

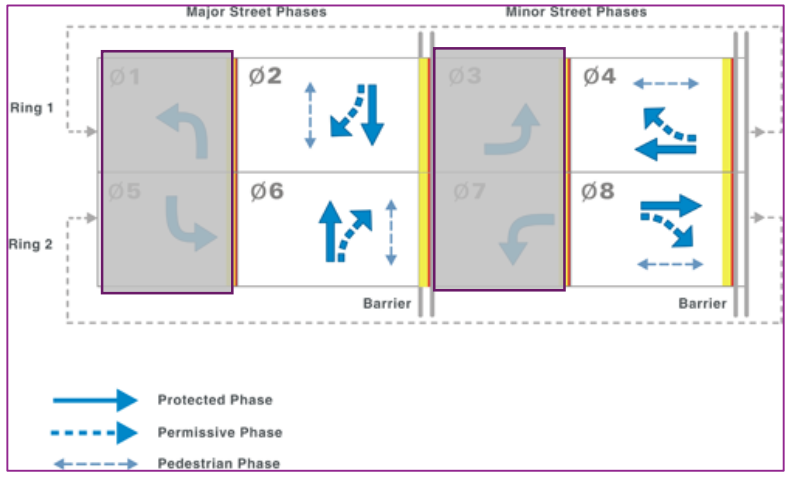
Operational Impacts (Delay & Level of Service)

The additional delay largely comes from the protected left-turn phases that will be added.

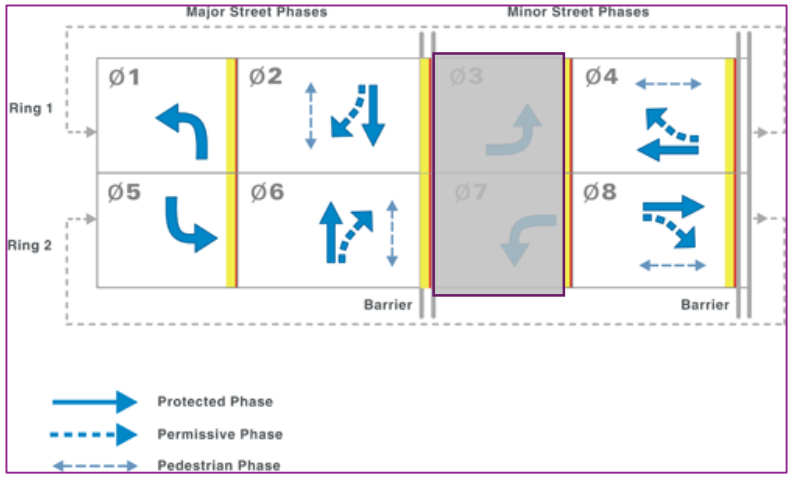
Standard Phase "Ring"



Existing Phasing at Washington



Proposed Phasing at Washington



- When the green arrow comes on for Northbound or Southbound left turns, all other movements have a red light.
  - This adds delay for all the other vehicle movements as they have a red light
  - This is a trade off between safety and efficiency.

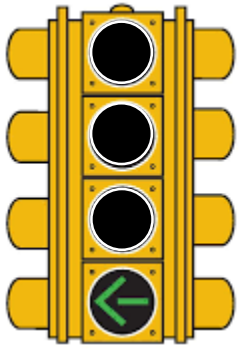
Operational Impacts (Delay & Level of Service)

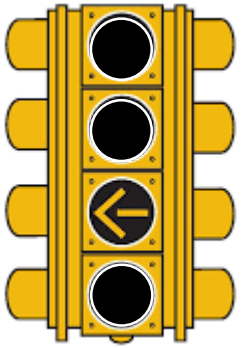
Westmore-Meyers Rd. at Washington Blvd.

Westmore-Meyers at Washington		Eastbound			Westbound			Northbound			Southbound			Overall
		L	T	R	L	T	R	L	T	R	L	T	R	
Existing	AM Peak Hour	D - 36.4			C - 34.8			A - 6.6*			A - 3.5*			A - 9.5 sec
	PM Peak Hour	C - 33.0			D - 46.3			A - 2.7*			A - 3.6*			A - 6.2 sec
Restriping Alternative	AM Peak Hour	D - 37.6			D - 35.6			A - 6.4	B - 12.5		A - 2.3	B - 10.7		B - 14.8 sec
								B - 11.8			B - 10.4			
	PM Peak Hour	C -32.4			D - 47.1			A - 3.7	A - 6.1		A - 1.1	A - 5.1		A - 8.3 sec
								A - 6.0			A - 5.0			

*The software will under estimate the delay as it cannot account for missed gaps of left turning vehicles due to negative offset

When there is a left turning vehicle on the detection:





Minimum 3 sec., Max 10 sec. + 3 seconds of Yellow = The Added Delay for other Movements

Operational Impacts (Delay & Level of Service)

Delay and LOS by intersection for the directly impacted corridor:

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**

- In the existing and proposed alternatives, all intersections function at a Level of Service A or B.
  - This meets driver expectancy for operations and performance.
  - This roadway still functions at a high level of service.

Operational Impacts (Delay & Level of Service)

NORTHBOUND Delays: **Roosevelt Road thru Maple Street** – Compared to Main Street:

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**

- Negligible difference on Westmore-Meyers between existing and proposed conditions
  - Proposed Conditions still have significantly less delay than on Main Street

Operational Impacts (Delay & Level of Service)

SOUTHBOUND Delays: **Maple Street to Roosevelt Road** – Compared to Main 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**

- Southbound thru traffic on Westmore-Meyers experiences more delay in the proposed conditions
  - The combined AM & PM Delays in the proposed alternative only differ from Main Street by 1.5 seconds.

Operational Impacts (Delay & Level of Service)

Other option – Do not provide a protected left turn phase and have a flashing yellow arrow.

We do not get the safety enhancement of a protected left-turn phase, but we still achieve:

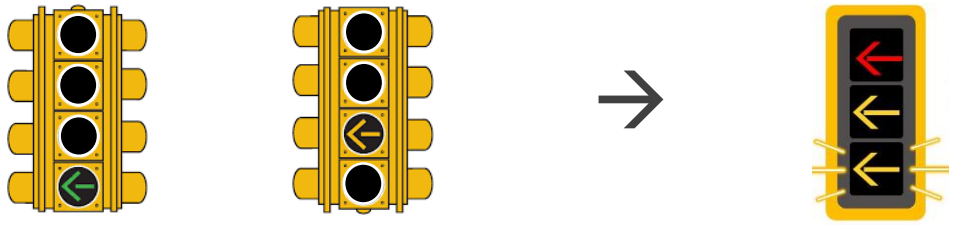
1. Elimination of negative offset left turns
2. Exclusive left turn lanes

And we can keep the same signal phasing as occurs today in order to minimize delay along the corridor.

*This option was not investigated in the Traffic Study.

3-SECTION FLASHING YELLOW ARROW

When there is a left turning vehicle on the detection:



Min 3 sec
Max 10 sec

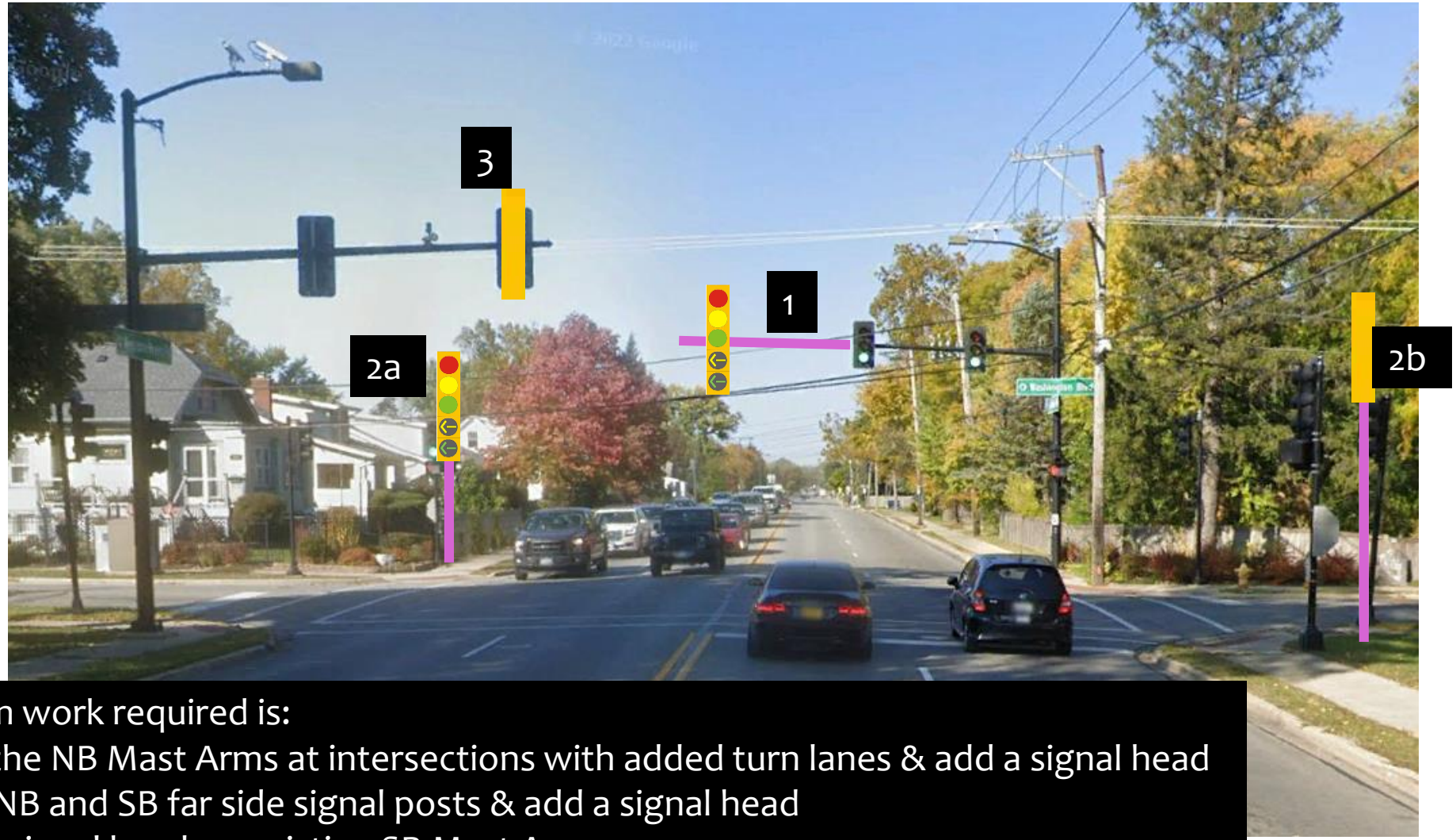
\+

3 sec

→

No Added Delay to Other Movements

Costs – Work Required (Preferred Alternative)



The minimum work required is:

1 – Replace the NB Mast Arms at intersections with added turn lanes & add a signal head

2 – Replace NB and SB far side signal posts & add a signal head

3 – Add new signal head on existing SB Mast Arm

4 – Remove existing striping from Westmore-Meyers Road and install new striping

Preliminary Construction Cost Estimate

Localized Improvements Only

Work Item	Unit Price	Total Price
Restriping	$75,000	$75,000
Signal Modifications		
Jackson Street	$80,000	$80,000
Washington Boulevard	$80,000	$80,000
Maple Street	$80,000	$80,000
Subtotal		$315,000
Mobilization 10% of Subtotal		$30,000
Traffic Control 10% of subtotal		$30,000
TOTAL		**$375,000**

Full Traffic Signal Modernizations throughout the Corridor

Work Item	Unit Price	Total Price
Restriping	$75,000	$75,000
Traffic Signal Modernization		
Jackson Street	$375,000	$375,000
Madison Street	$375,000	$375,000
Washington Boulevard	$375,000	$375,000
Maple Street	$375,000	$375,000
St. Charles Road	$375,000	$375,000
Subtotal		$1,950,000
Mobilization 10% of Subtotal		$195,000
Traffic Control 10% of subtotal		$195,000
TOTAL		**$2,340,000**
If Federally Funded at 70/30		
Village of Lombard Share		**$702,000**
Federal Share		$1,638,000

**St. Charles & Madison added to show full corridor improvements

Questions that remain

1. Village preferred treatment of left turn phases
   - Protected-Permitted Phases (as shown)
     - Highest Level of Safety Improvement
   - Permitted ONLY with a flashing yellow arrow
     - No delay from green & yellow left turn arrows
     - Signal Phasing will function like the existing conditions

2. Village preferred length of a Re-striping Improvement
   - St. Charles Road to…
     - Maple,
     - Washington,
     - Madison, or
     - through Jackson (as shown)

Possible Next Steps

Near Term:

A. Leave corridor "as is"

B. Pursue interim improvement

- Add protected left-turn phase for either Northbound or Southbound traffic at Washington Blvd.
  - Similar to Jackson Street & Maple Street
  - Northbound Left Turns are significantly more than Southbound Left Turns

Longer Term:

C. Perform Re-striping Project with 100% Local Dollars

- Could do the localized improvements only or modernize the traffic signals
- Timeline would be sooner

D. Apply for Federal Funding

- STP-Local will have a call for projects in ***October of 2023*** (Max funding match 70/30)
  - ***To apply, we would need a clearly defined project scope and project termini***
  - Construction year is dependent on DMMC funds, likely 2027-2029

Possible Next Steps

Staff Recommendations -

Near Term:

- Pursue interim improvement
  - Add protected left-turn phase for either Northbound or Southbound traffic at Washington Blvd.
    - Similar to Jackson Street & Maple Street – based on Volumes, NB left turns
    - Approximately $30,000 Construction Cost

Medium to Longer Term:

- Continued evaluation of crashes & potential improvements going forward
- Include this project in the 2024-2033 CIP
- Enter into Preliminary Engineering contract in 2024

Thank You

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