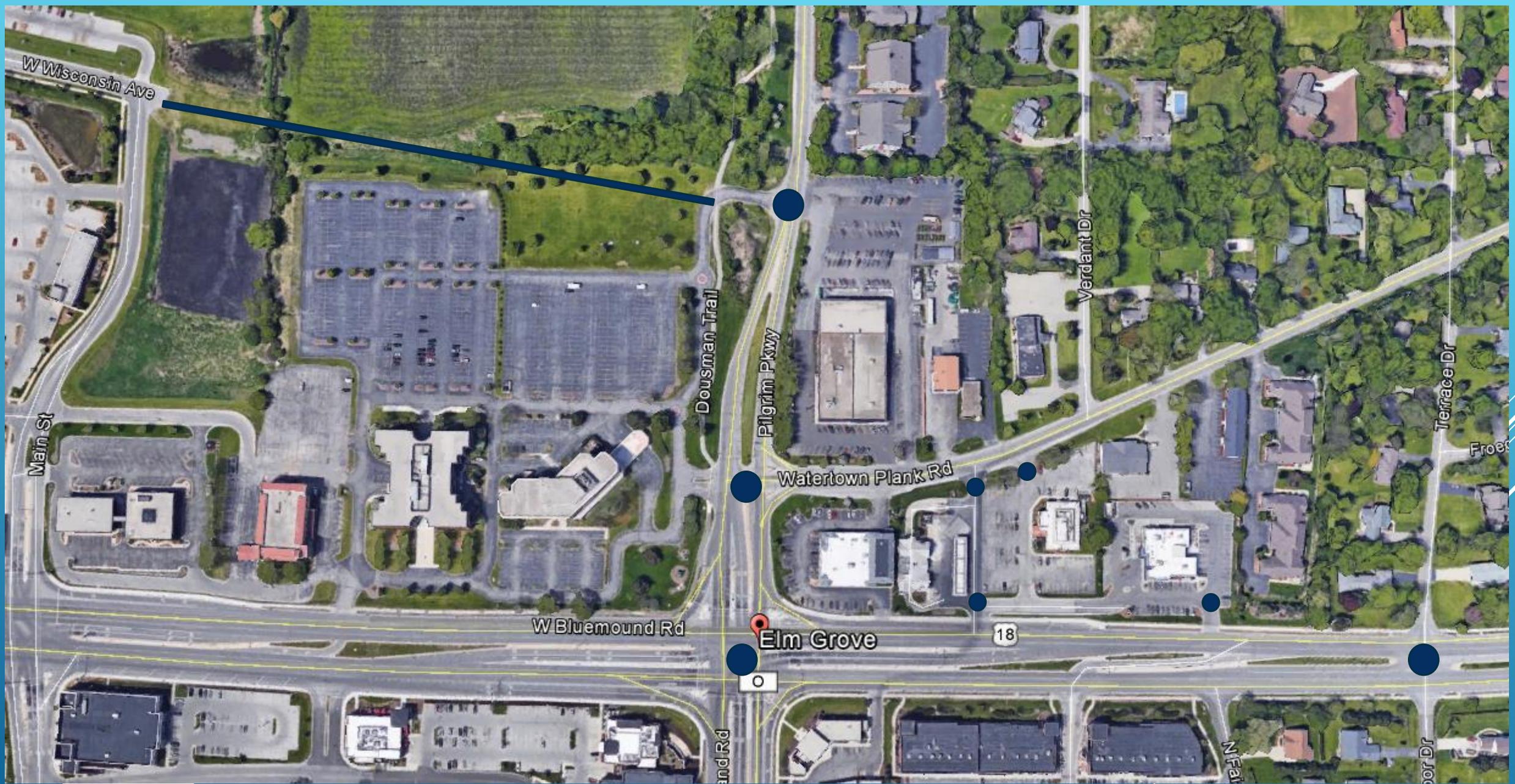


# WISCONSIN AVENUE EXTENSION TECHNICAL REVIEW

November 16, 2016



# RELATED TRAFFIC DATA

## Intersection Spacing:

- Bluemound to Watertown Plank Road  
= 325 feet
- Watertown Plank Road to Wisconsin Ave  
= 535 feet

## Evening Peak Hour Traffic:

- Watertown Plank Road = 940 vph
- Office Access (north) = 220 vph
- Office Access (south) = 80 vph
- Pilgrim Parkway = 2,410 vph
- Bluemound Road = 4,640 vph

# RELATED TRAFFIC DATA

## Selected Peak Hour Traffic Movement Volumes:

- Watertown Plank Road westbound left turn = 350 vph
- North Shore Bank eastbound right turn = 100 vph
- Ace Hardware driveway (2-way volume) = 110 vph
  
- Pilgrim Parkway southbound left turn at Watertown Plank Road = 65 vph
- Pilgrim Parkway northbound right turn at Watertown Plank Road = 380 vph
  
- Bluemound Road eastbound left turn at Pilgrim Parkway = 645 vph

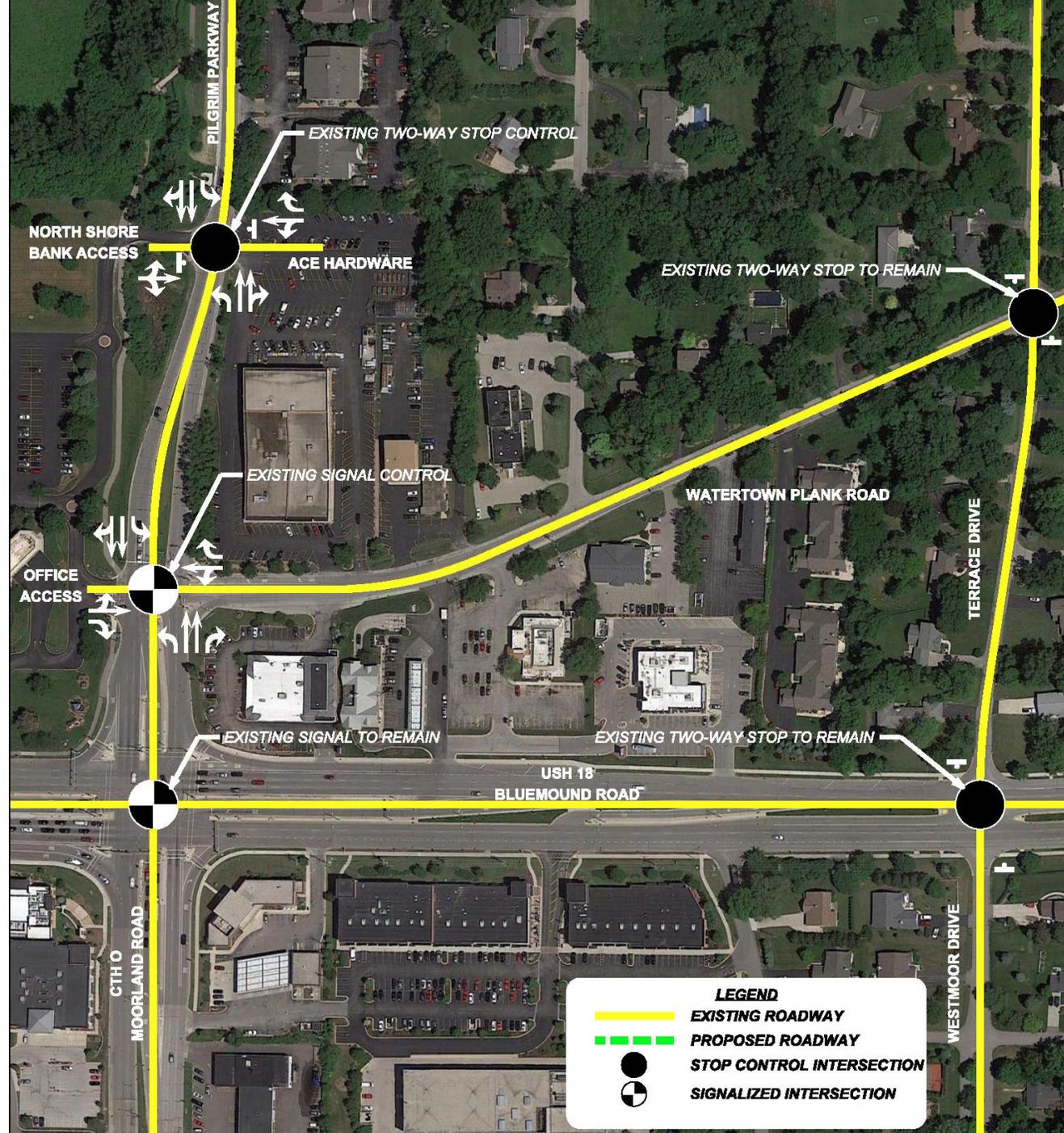
## Ayres Associates Field Observations:

1. Eastbound Bluemound left turn regularly backs into Bluemound intersection from Watertown Plank Road intersection (up to 4 cars)
2. Southbound Pilgrim Road traffic sometimes backs into Watertown Plank Road intersection
3. Traffic diversion observed on Terrace Drive
4. Terrace Drive right turn conflicts with eastbound Bluemound Road U-turns
5. Minor cut-through traffic observed in Bakers Square and Mobil parking lots

# WISCONSIN AVENUE ANALYSIS SCENARIOS

<b>Scenario</b>	<b>Description</b>
1	Existing Condition (no extension)
2	Extension with 2-way stop signs
3	Extension with traffic signals
4	Extension with removal of Watertown signals but allow right turns and northbound left A – with signals at Wisconsin Avenue B – with roundabout at Wisconsin Avenue
5	Extension with realigned Watertown Plank Road and Watertown cul-de-sac A – with signals at Wisconsin Avenue B – with roundabout at Wisconsin Avenue

# Scenario 1 Existing Conditions



# Scenario 1

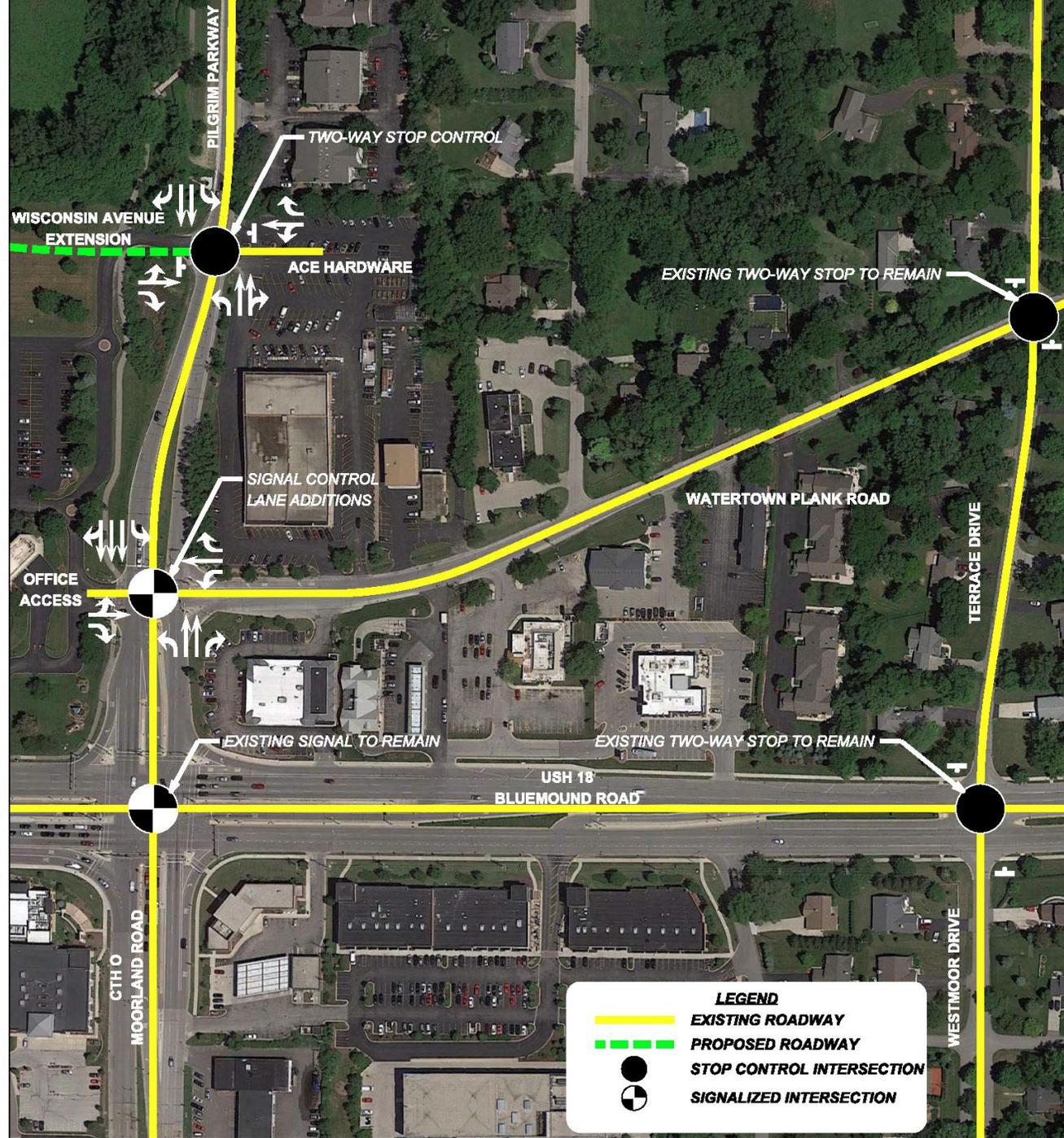
Year 2031 Scenario 1 Peak Hour Operating Conditions  
With Recommended Geometrics and Traffic Control

Intersection	Traffic Control	Peak Hour	Level of Service per Movement by Approach											
			Eastbound			Westbound			Northbound			Southbound		
			LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Pilgrim Parkway/Moorland Road & Bluemound Road	Traffic Signal	AM	D	C	A	E	C	C	F	D	D	E	E	D
		PM	F	D	B	E	D	C	F	E	D	E	F	C
Pilgrim Parkway & Watertown Plank Road/Office Access	Traffic Signal	AM	B	B	B	C	C	B	A	A	A	A	A	A
		PM	B	B	B	D	D	B	B	B	D	C	B	B
Pilgrim Parkway & Office Access/ Ace Hardware	Two-Way Stop Sign	AM	C	C	C	C	C	A	B	*	*	A	*	*
		PM	C	C	C	D	D	A	A	*	*	B	*	*

Notes: (-) indicates a movement that is not possible or is prohibited.

(\*) indicates a movement that is not controlled or is free-flow.

# Scenario 2 - Wisconsin Avenue Extension with Stop Signs



# Scenario 2

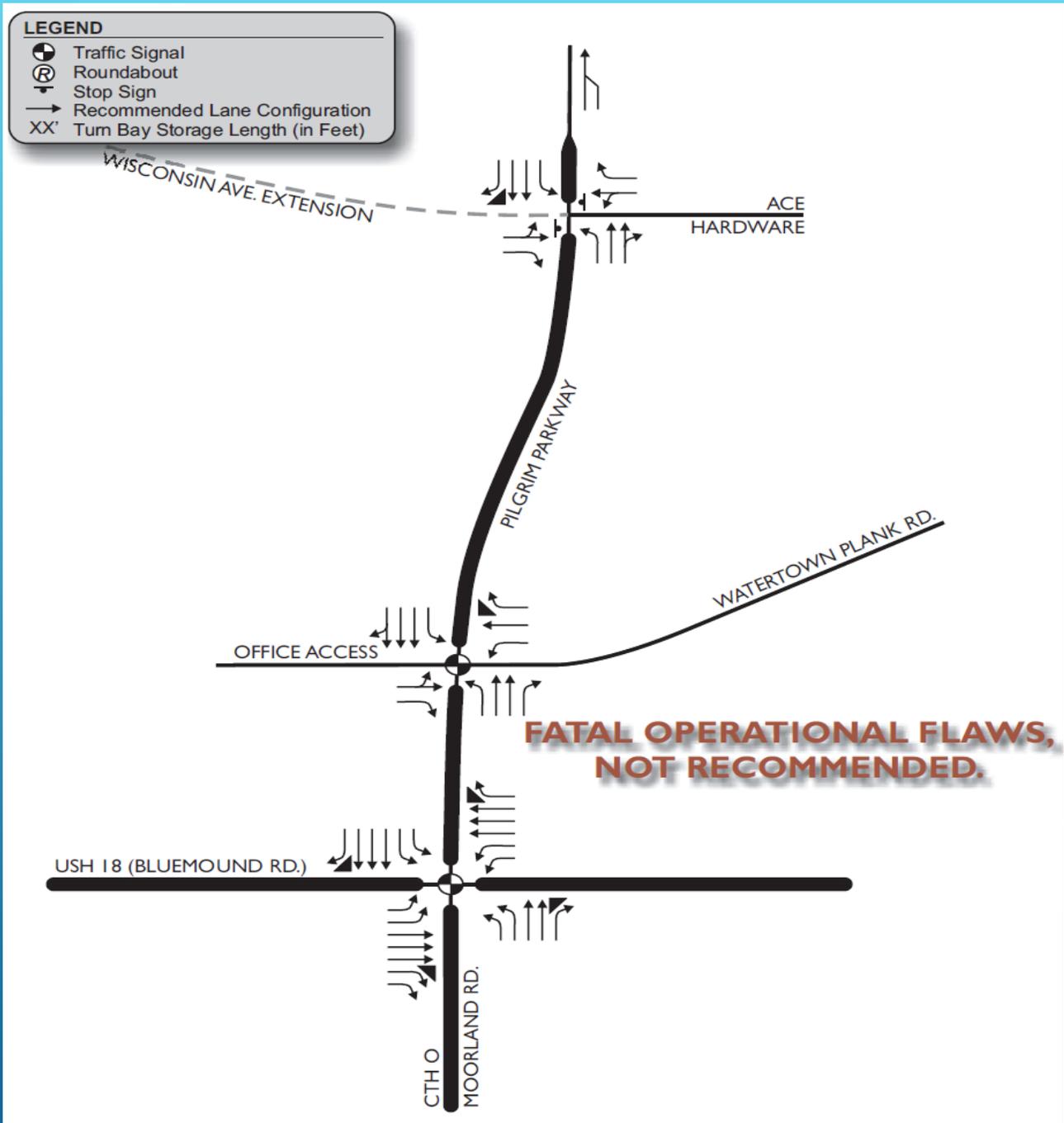
Year 2031 Scenario 2 Peak Hour Operating Conditions  
With Recommended Geometrics and Traffic Control

Intersection	Traffic Control	Peak Hour	Level of Service per Movement by Approach											
			Eastbound			Westbound			Northbound			Southbound		
			LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Pilgrim Parkway/Moorland Road & Bluemound Road	Traffic Signal	AM	D	C	A	E	C	C	F	E	D	F	F	D
		PM	F	D	B	E	D	C	F	F	D	F	F	D
Pilgrim Parkway & Watertown Plank Road/Office Access	Traffic Signal	AM	B	B	B	C	B	B	B	B	B	A	A	A
		PM	B	B	B	D	B	B	B	B	D	B	B	B
Pilgrim Parkway & Wisconsin Avenue Extension/Ace Hardware	Two-Way Stop Sign	AM	F	F	C	F	F	A	B	*	*	A	*	*
		PM	F	F	B	F	F	A	B	*	*	A	*	*

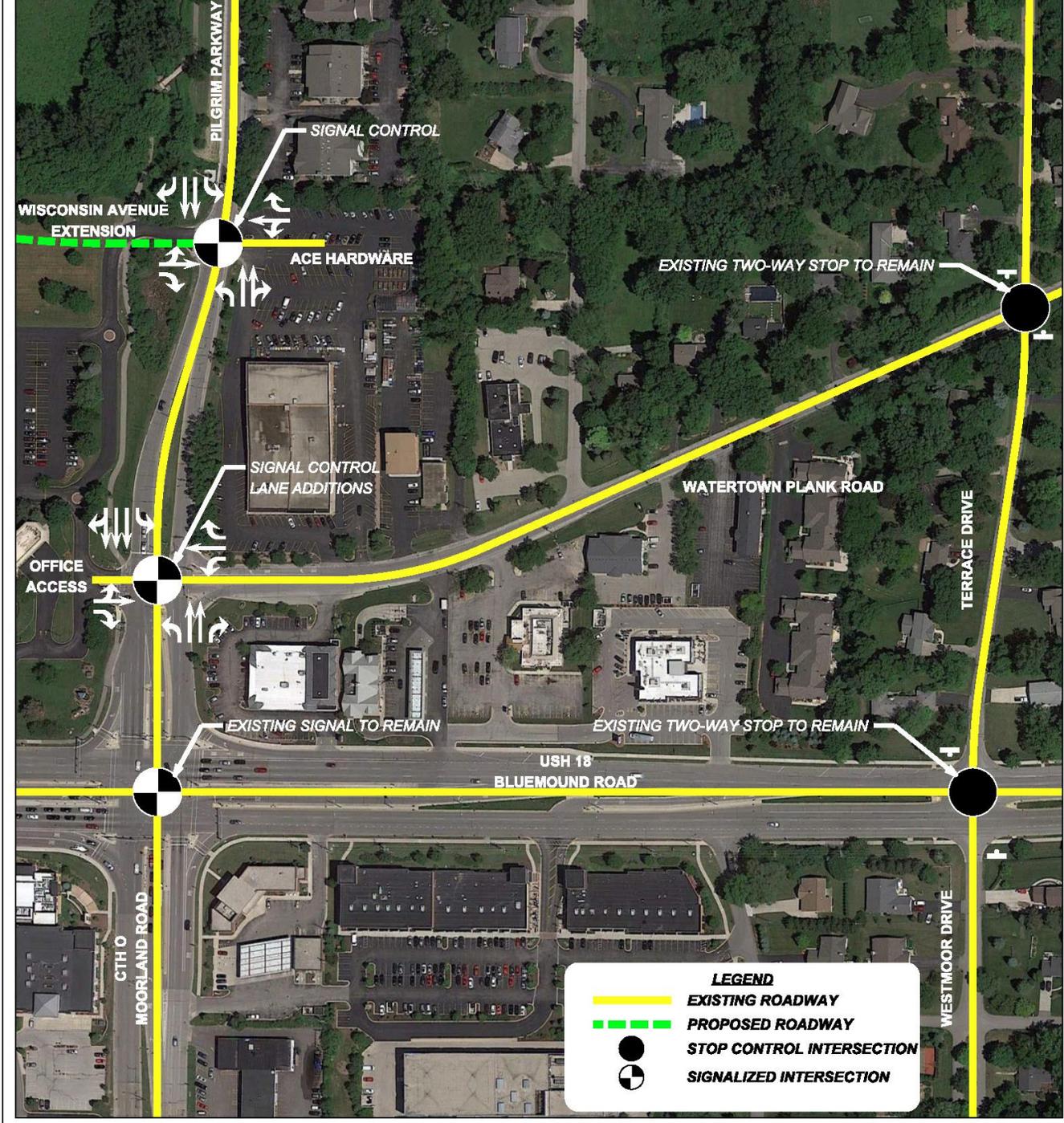
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# Scenario 2 Intersection Improvements



# Scenario 3 – Wisconsin Avenue Extension with Signals



# Scenario 3

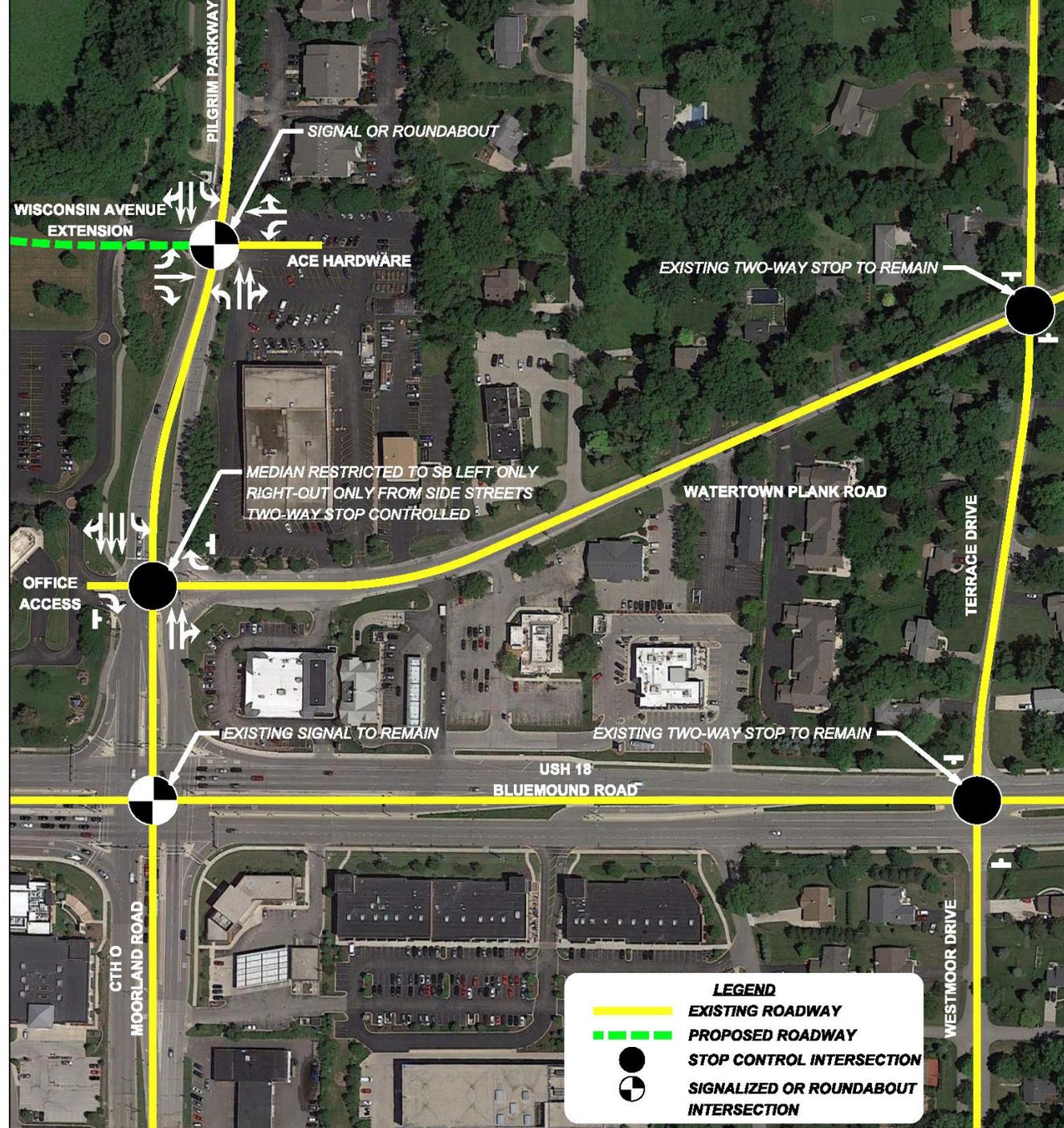
## Year 2031 Scenario 3 Peak Hour Operating Conditions With Recommended Geometrics and Traffic Control

Intersection	Traffic Control	Peak Hour	Level of Service per Movement by Approach											
			Eastbound			Westbound			Northbound			Southbound		
			LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Pilgrim Parkway/Moorland Road & Bluemound Road	Traffic Signal	AM	D	C	A	E	C	C	F	E	D	F	F	D
	Traffic Signal	PM	F	D	B	E	D	C	F	F	D	F	F	D
Pilgrim Parkway & Watertown Plank Road/Office Access	Traffic Signal	AM	B	B	B	C	B	B	B	B	B	A	A	A
	Traffic Signal	PM	B	B	B	D	B	B	B	B	D	B	B	B
Pilgrim Parkway & Wisconsin Avenue Extension/Ace Hardware	Traffic Signal	AM	C	C	B	B	B	B	A	A	A	B	B	B
	Traffic Signal	PM	C	C	B	B	B	B	A	A	A	B	B	B

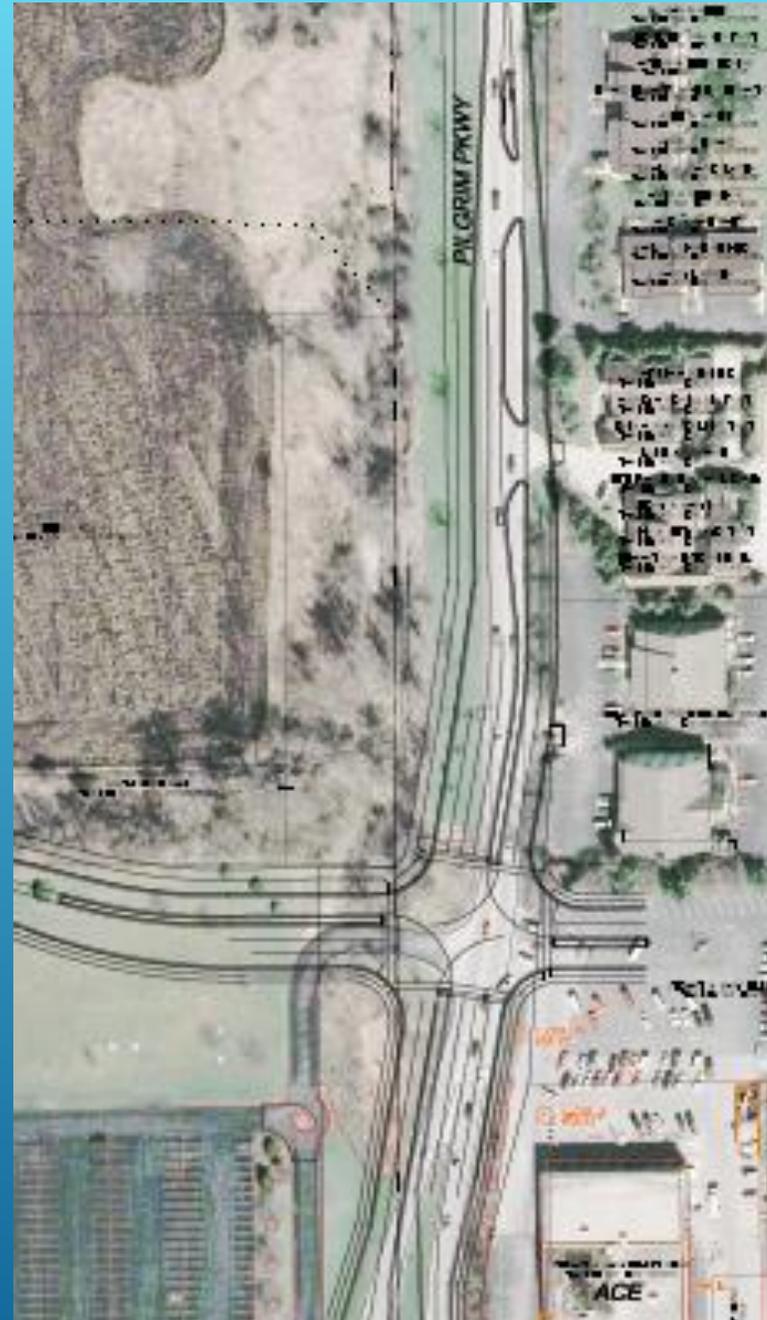
Notes: (-) indicates a movement that is not possible or is prohibited.

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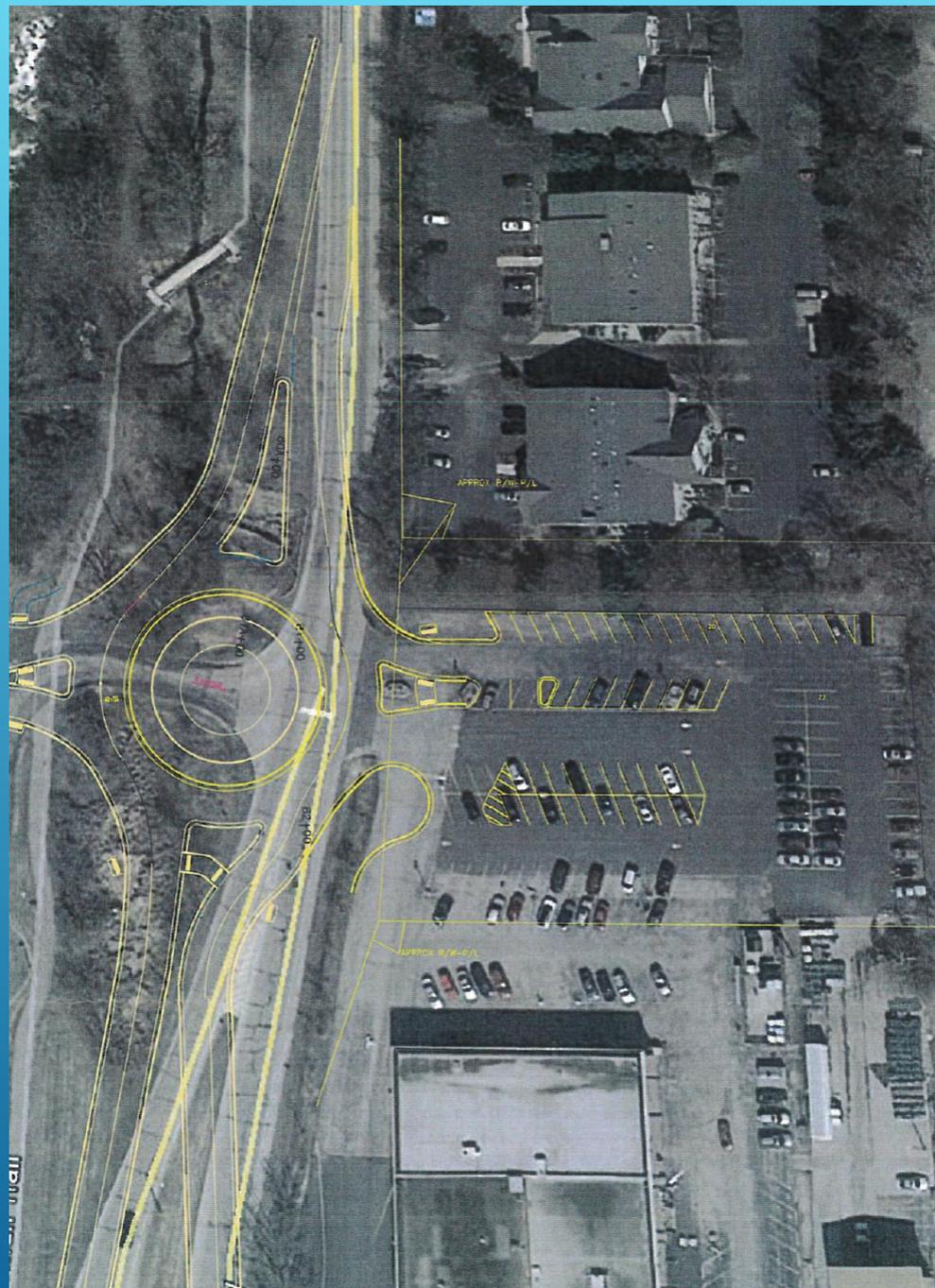
# Scenario 4A & 4B – Wisconsin Avenue Extension with No Westbound Left Turn



# Scenario 4A Signalized Intersection Design Concept



# Scenario 4B Roundabout Design Concept



# TRAFFIC SIGNALS VS ROUNDABOUT PROS/CONS

## Traffic Signals

- Potentially less right-of-way and environmental impacts
- Easier to use for sight-impaired pedestrians
- Serves as a southbound traffic metering tool to Bluemound Road intersection
- Requires eastbound Wisconsin Avenue 'No Turn on Red' restriction to accommodate northbound U-turns

## Roundabouts

- Safer than traffic signals with less severe crashes
- Operates at a higher Level of Service with reduced queuing

# Scenario 4A & 4B

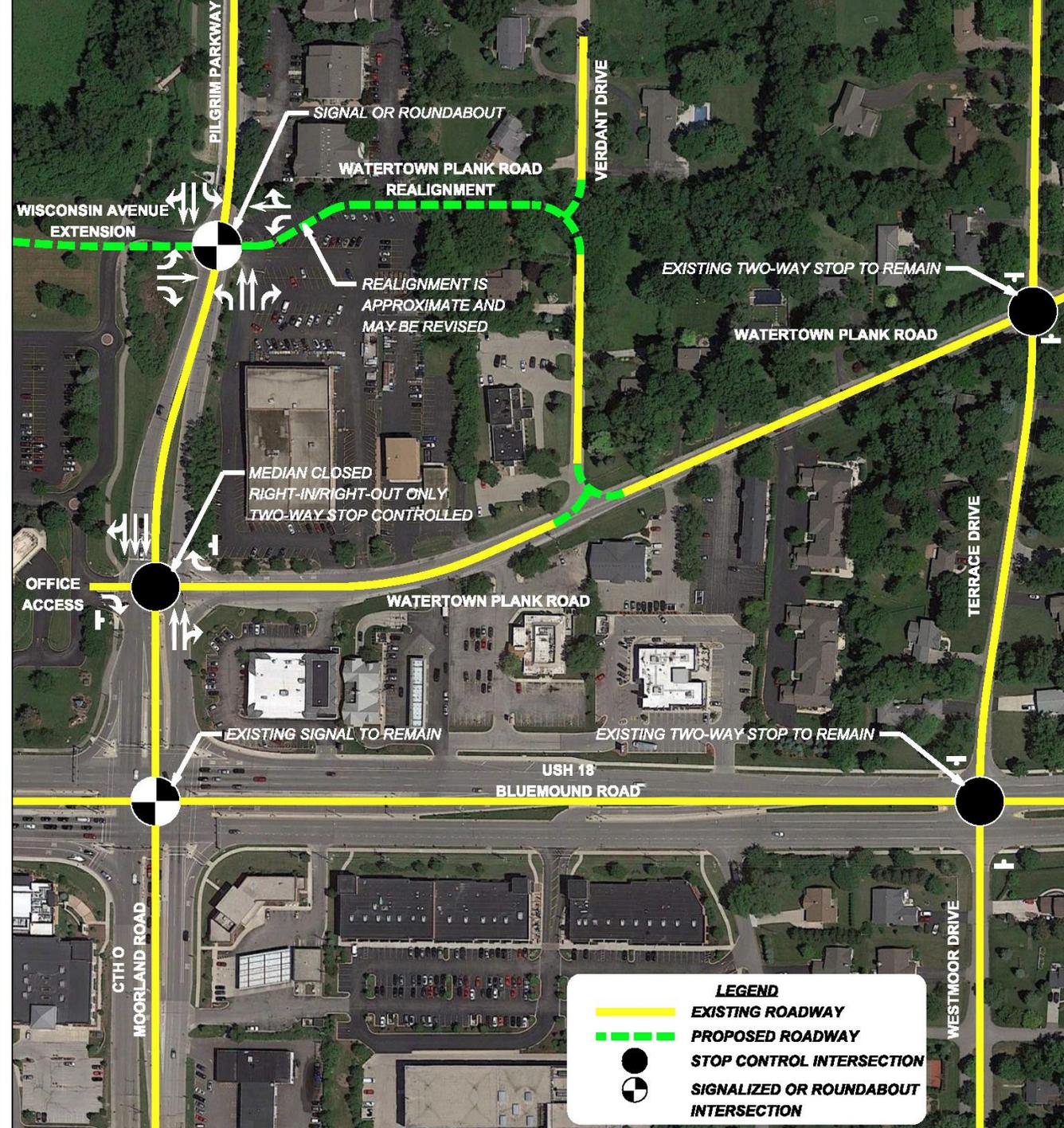
## Year 2035 Scenario 4 Peak Hour Operating Conditions With Recommended Geometrics and Traffic Control

Intersection	Traffic Control	Peak Hour	Level of Service per Movement by Approach											
			Eastbound			Westbound			Northbound			Southbound		
			LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Pilgrim Parkway/Moorland Road & Bluemound Road	Traffic Signal	AM	E	D	B	E	D	D	D	D	F	E	E	B
		PM	E	E	D	E	D	B	F	E	D	E	E	C
Pilgrim Parkway & Watertown Plank Road/Office Access	Two-Way Stop Sign	AM	-	-	B	-	-	B	-	*	*	A	*	*
		PM	-	-	B	-	-	B	-	*	*	A	*	*
Pilgrim Parkway & Wisconsin Avenue Extension/Ace Hardware	Traffic Signal	AM	C	C	C	C	C	C	A	A	A	A	B	B
		PM	C	C	D	C	C	C	B	A	A	B	C	C
	Roundabout	AM	A	A	A	A	A	A	A	A	A	A	A	A
		PM	B	B	C	B	B	B	B	B	B	B	B	B

Notes: (-) indicates a movement that is not possible or is prohibited.

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# Scenario 5A & 5B – Wisconsin Avenue Extension with Relocated Watertown Plank Road



# Scenario 5A & 5B

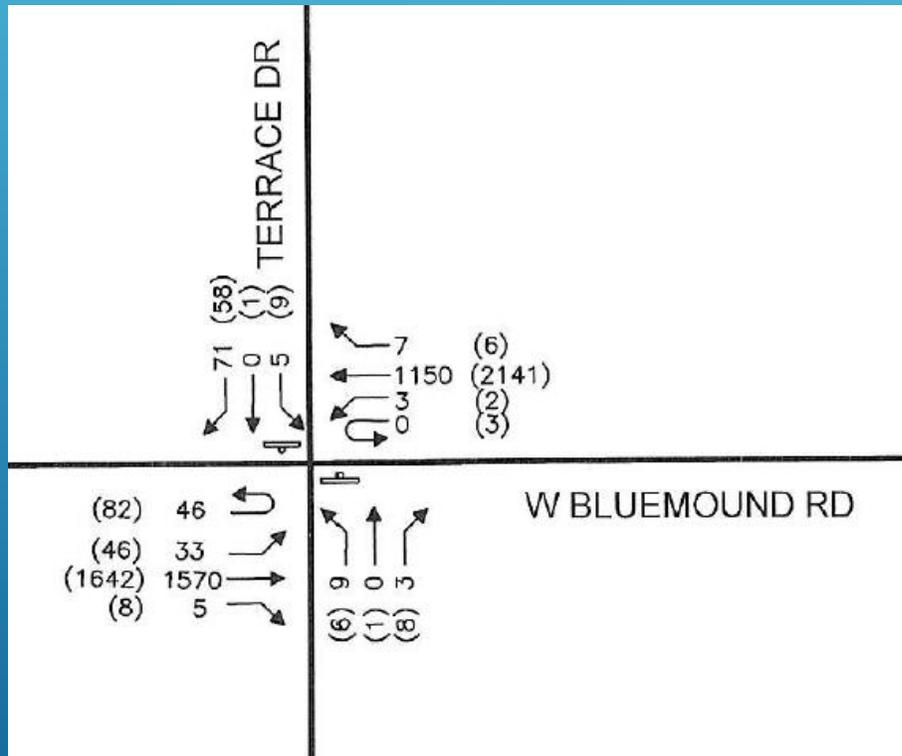
Year 2035 Scenario 5 Peak Hour Operating Conditions  
With Recommended Geometrics and Traffic Control

Intersection	Traffic Control	Peak Hour	Level of Service per Movement by Approach											
			Eastbound			Westbound			Northbound			Southbound		
			LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Pilgrim Parkway/Moorland Road & Bluemound Road	Traffic Signal	AM	E	D	B	E	D	D	D	D	F	E	E	B
		PM	E	E	D	E	D	B	F	E	D	E	E	C
Pilgrim Parkway & Watertown Plank Road/Office Access	Two-Way Stop Sign	AM	-	-	B	-	-	-	-	*	*	-	*	*
		PM	-	-	B	-	-	-	-	*	*	-	*	*
Pilgrim Parkway & Wisconsin Avenue Extension/Ace Hardware	Traffic Signal	AM	C	C	C	C	C	C	A	A	A	B	B	B
		PM	D	C	C	C	C	C	C	A	A	B	C	C
	Roundabout	AM	A	A	A	B	B	B	A	A	A	A	A	A
		PM	D	D	D	C	C	C	B	B	B	B	B	B

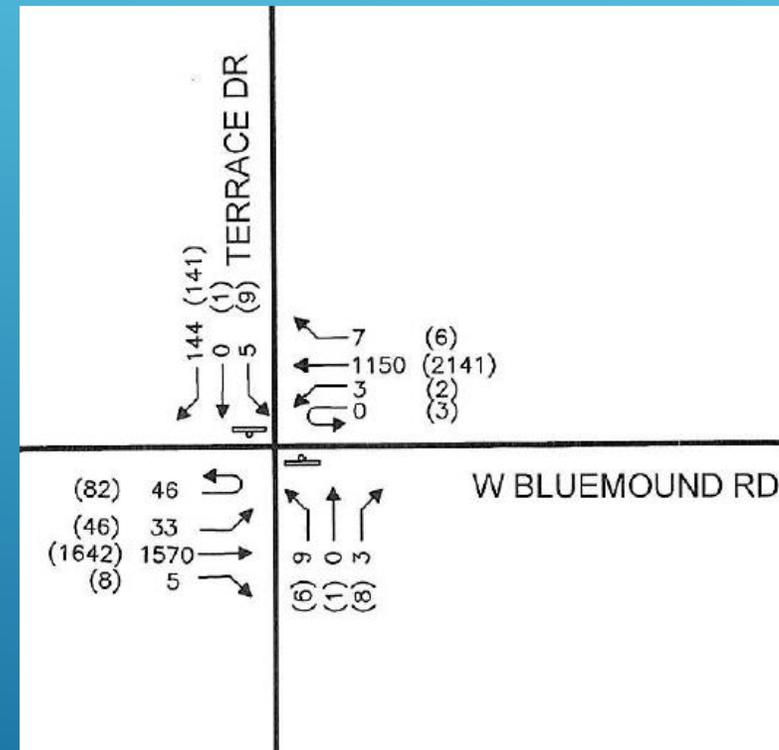
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# Terrace Drive Traffic Diversion Impact

Existing Peak Hour Volumes



With Diversion Peak Hour Volumes



# CUT-THROUGH TRAFFIC MITIGATION OPTIONS

- ▶ Prohibit southbound right turns at Bluemound Road
- ▶ Prohibit northbound left turns from Watertown Plank Road
- ▶ Cul-de-sac Terrace Drive at Bluemound Road
- ▶ Convert Terrace Drive to collector street and purchase adjacent properties
- ▶ Construct Alternative 5 with a relocated Watertown Plank Road

# WISCONSIN AVENUE SCENARIO PROS/CONS

<b>Scenario</b>	<b>Description</b>
1	a. Bluemound queues extend into Watertown Plank Road intersection b. Cannot fit required turn lane lengths between intersections
2	a. LOS 'F' operation and delays exceeding 3-minutes
3	a. Bluemound queues extend into Watertown Plank Road intersection b. Cannot fit required turn lane lengths between intersections

# WISCONSIN AVENUE SCENARIO PROS/CONS

## Scenario      Description

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- 4A
- a. Eliminates Watertown Plank Road left turn movement
  - b. Creates northbound U-turn at Wisconsin Avenue extension
  - c. Creates traffic diversion to neighborhood streets
  - d. Requires cut-through traffic mitigation on Terrace Drive
- 

- 4B
- a. Similar impacts as 4A
- 

- 5A
- a. Maintains full access Watertown Plank Road with Pilgrim Parkway
  - b. Negatively impacts Ace Hardware parking lot
  - c. Requires right-of-way for realigned Watertown Plank Road
  - d. Reduces North Shore Bank access to right-in/right-out
- 

- 5B
- a. Similar impacts as 5A
-