R10-11a

R10-11b

Presentation outline

- Purpose of today's presentation
- History of Right Turns on Red
- Studies
- Current Federal Standards
- What are other cities doing?
- City of Madison
  - Right turn crashes
  - Current policy
  - Current inventory of NTOR signs
  - Next Steps

Purpose

- Provide background on right turn on red (RTOR) and No Turn on Red (NTOR) restrictions
- Summarize research and national practice
- Review Madison’s use of NTOR
- Discuss future use of engineering judgment and receive TC feedback

History of Right Turns on Red

- Pre-1960s
  - Right on red was prohibited in the U.S.
- 1973 Oil Embargo / Energy Crisis
  - Severe fuel shortages—energy conservation became a national priority
  - Allowing right turns on red was a way to reduce fuel consumption
  - FHWA issued guidance encouraging states to allow right turns on red after a full stop
  - By the 1980s, right on red was legal in all 50 states
  - Safety studies showed:
    - Modest increase in pedestrian conflicts
    - Improved vehicle operations and reduced delay
- Today, the policy is standard in the U.S., except in places like New York City or some urban downtowns where blanket bans exist.
- Modern debates focus on pedestrian safety, Vision Zero initiatives, and the balance between traffic efficiency vs. safety.

International Context

- Some countries never adopted right on red, e.g., many in Europe. They prioritize pedestrian and cyclist safety over small fuel/time savings.

Safety studies on Right Turns on Red (RTOR)

- Only one peer-reviewed before/after crash study (Preusser, 1982)
- FHWA has consistently concluded RTOR creates a small but measurable pedestrian safety concern
- Crash Modification Factors estimate pedestrian crashes may increase by 40-100%
- Modern research relies heavily on observations of ped/vehicle conflicts because crashes are uncommon

Connecticut State Study 2023

- One of the most direct NTOR policy evaluations
- Found:
  - NTOR effectiveness varies widely by location
  - Strongest benefits where:
    - Pedestrian volumes are high
- Did NOT recommend blanket NTOR statewide
- Recommended:
  - More targeted use + stronger ped safety emphasis

Evolution of RTOR Research

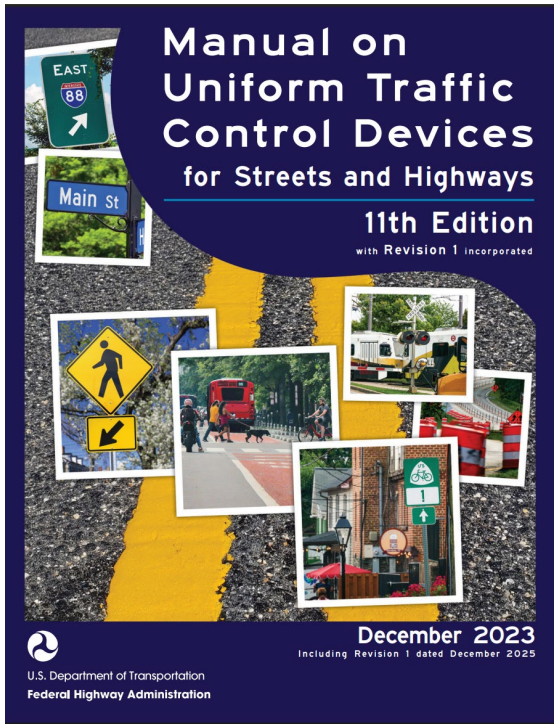
- 1980s—documented increased pedestrian conflicts
- 1990s—greatest concern in high pedestrian areas
- 2000s-present—focus shifts toward Vision Zero and pedestrian comfort

Approaches Used by Other Jurisdictions

- 4 tiers of NTOR policy in the U.S.
  - **Tier 1 — Default prohibition**
    - RTOR prohibited unless specifically permitted by sign
    - New York City, and recently Washington, D.C.
  - **Tier 2 — Area-based bans**
    - NTOR used throughout designated districts (downtowns, campus, etc.)
    - Ann Arbor, Atlanta, Cambridge, parts of San Francisco
  - **Tier 3 — Policy-based expansion**
    - Agency policy encourages broader installation of NTOR
    - Chicago, LA, Denver, Seattle
  - **Tier 4 — Location-specific engineering judgment**
    - NTOR installed only where engineering analysis identifies need
    - Most U.S. cities

Manual for Uniform Traffic Control Devices (MUTCD)

- MUTCD requires NTOR signs in limited circumstances, but otherwise leaves installation to engineering judgment



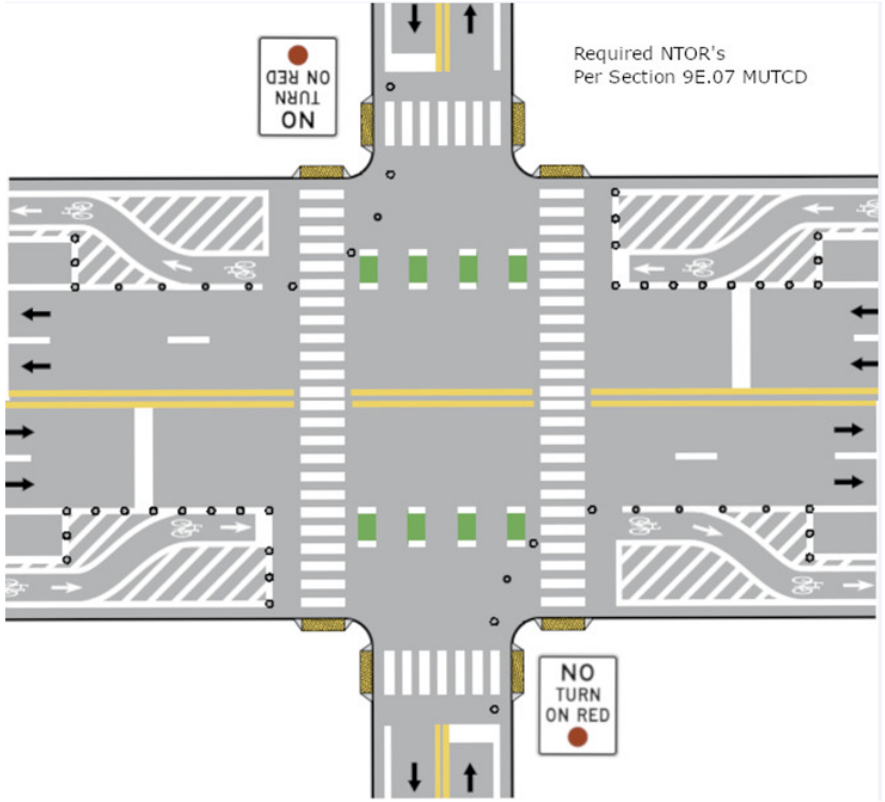
Manual for Uniform Traffic Control Devices (MUTCD)

Condition 1

Section 9E.07 Separated Bicycle Lanes

12 **Turns on red shall be prohibited across separated bicycle lanes while bicyclists are allowed to proceed through the intersection.**

Note: Separated bicycle lanes provide a physical separation between a general-purpose lane and a bicycle lane. Vertical elements used to provide physical separation between general-purpose lanes and bicycle lanes may include, but are not limited to, tubular markers, raised islands, or parked vehicles.

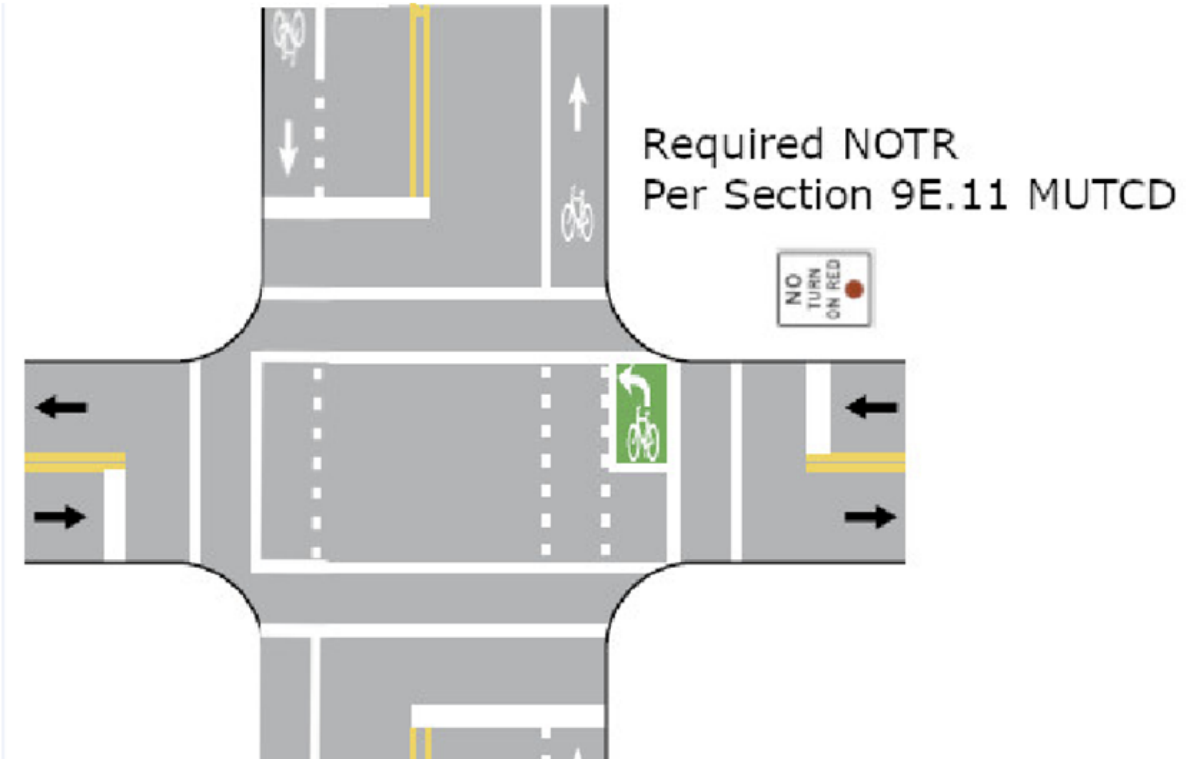


Manual for Uniform Traffic Control Devices (MUTCD)

Condition 2

Section 9E.11 Two-Stage Bicycle Turn Boxes

13 **Where the path of vehicles lawfully turning on red would pass through a two-stage bicycle turn box, a full-time no-turn-on-red prohibition (see Section 2B.60) shall be provided for the crossroad approach.**



Manual for Uniform Traffic Control Devices (MUTCD)

- What does **Engineering Judgment** include in this context?
  - Pedestrian volumes
  - Bicycle volumes
  - Crash history
  - School crossings
  - Transit activity
  - Sight distance
  - Signal operations
  - Driver expectations

5-Year Crash Statistics (2021 thru 2025)

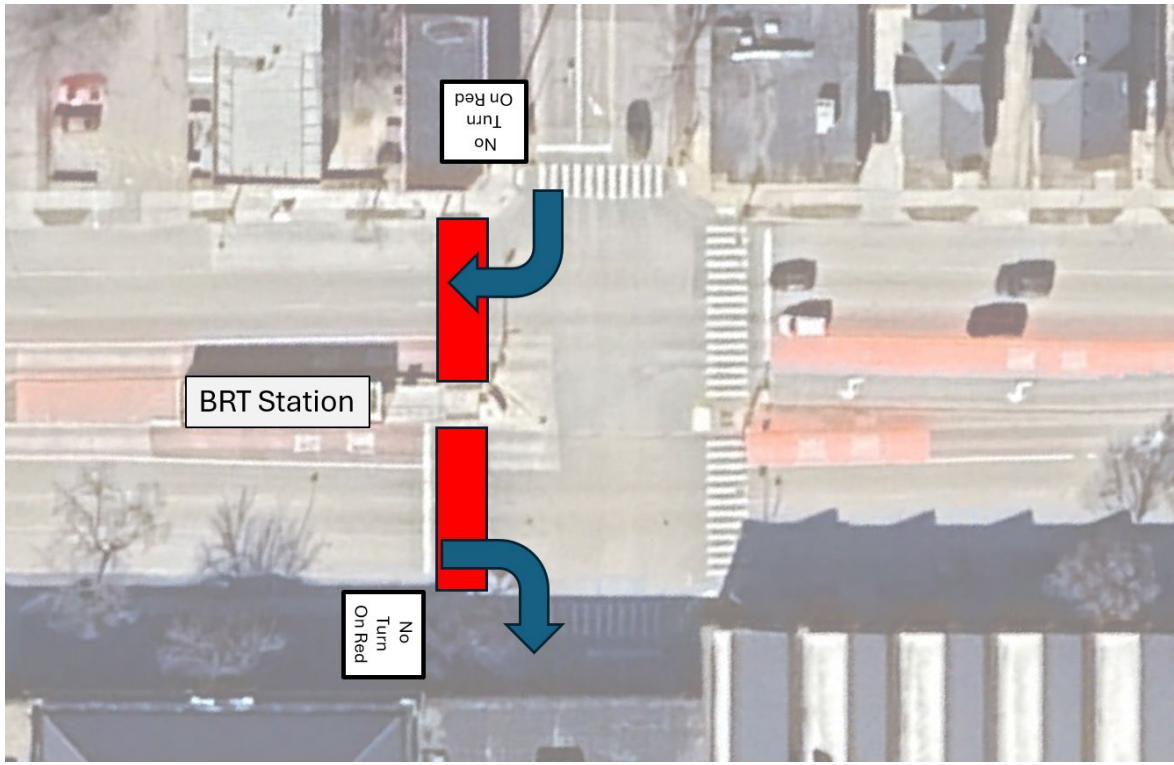
# Crashes	Type
17,777	Total City of Madison crashes
4,752	signalized intersection crashes
97	RTOR crashes
42	Right turn crashes with a ped/bike at signalized intersections
14	**RTOR crashes with a ped/bike**

Right Turn Crashes with Pedestrians or Bikes at Signalized Intersections

			Was the right turn on Red or on Green?				Injury Status				
2025	Location	Date	allowed RTOR	restricted RTOR	RTOG	not stated	No Injury	Possible Injury	Minor Injury	Major Injury	Fatality
2	Broom & Johnson	1/1/2025			1			1			
3	Bassett & W Washington	1/18/2025			1		1				
4	Park & Fish Hatchery	3/4/2025			1			1			
6	Commerce & Watts	3/26/2025			1		1				
7	Atwood & Walter	5/22/2025				1	1				
5	N Shore & John Nolen	6/9/2025		1			1				
1	Highland & University	11/8/2025			1		1				
8	John Nolen & Rimrock	11/19/2025	1					1			
2024											
1	Cottage Grove & Stoughton Rd SB on ramp	2/5/2024				1					
2	Park & Erin	4/15/2024	1					1			
3	John Nolen & Lakeside	8/15/2024	1						1		
4	High Crossing Blvd & Nelson Rd	9/12/2024	1						1		
5	E Wash and Aberg WB Ramp	9/26/2024	1					1			
6	Gammon & Watts	10/9/2024	1					1			
2023											
1	Division & Eastwood	3/7/2023			1				1		
2	Raymond & Whitney	3/30/2023			1				1		
3	E Washington & Johnson (shopping driveway)	4/7/2023			1		1				
4	Raymond & Prairie	8/1/2023	1								1
5	Johnson St & Wisconsin Ave	8/3/2023	1						1		
6	Cottage Grove Rd & Stoughton Rd SB on ramp	8/7/2023	1				1				
7	East Washington & Marquette	9/30/2023				1				1	
8	Johnson St & Wisconsin Ave	11/1/2023	1						1		
9	Fish Hatchery & Badger	11/30/2023	1					1			
10	W Washington and Regent St	12/9/2023			1			1			
11	Northport & Sherman	12/14/2023				1		1			
2022											
1	Dayton & Park	4/4/2022			1				1		
2	John Nolen & Broom	6/15/2022	1						1		
3	John Nolen & N Shore	7/30/2022		1					1		
4	Old Sauk & SB Beltline ramp	8/30/2022	1					1			
5	Todd & Beltline Frontage Rd	10/13/2022			1			1			
6	Bedford & W Wash	10/19/2022			1				1		
7	Johnson & Park	11/1/2022			1			1			
2021											
1	E Wash & EB Aberg Ramp	5/7/2021	1					1			
2	McKee & Muir Field	5/13/2021			1				1		
3	John Nolen & N Shore	8/26/2021		1			1				
4	Odana & Grand Canyon	8/29/2021			1				1		
5	John Nolen & N Shore	9/30/2021			1				1		
6	University & Frances	10/7/2021			1				1		
7	Park & Dayton	11/19/2021			1			1			
8	Odana & Gammon	11/29/2021			1			1			
9	Park & Dayton	12/1/2021			1		1				
10	Midvale & Regent	12/10/2021			1				1		
			14	3	21	4	9	15	15	1	1

City of Madison Bus Rapid Transit (BRT) Stations

- The design team installed NTOR restrictions wherever a right turn crossed a crosswalk providing direct access to a BRT station
  - at 23 BRT Stations
  - ~37 additional NTOR restrictions
- Resulted in many restrictions along East Washington Avenue and Mineral Point Road added simultaneously in Fall 2024 with the start of East/West BRT.



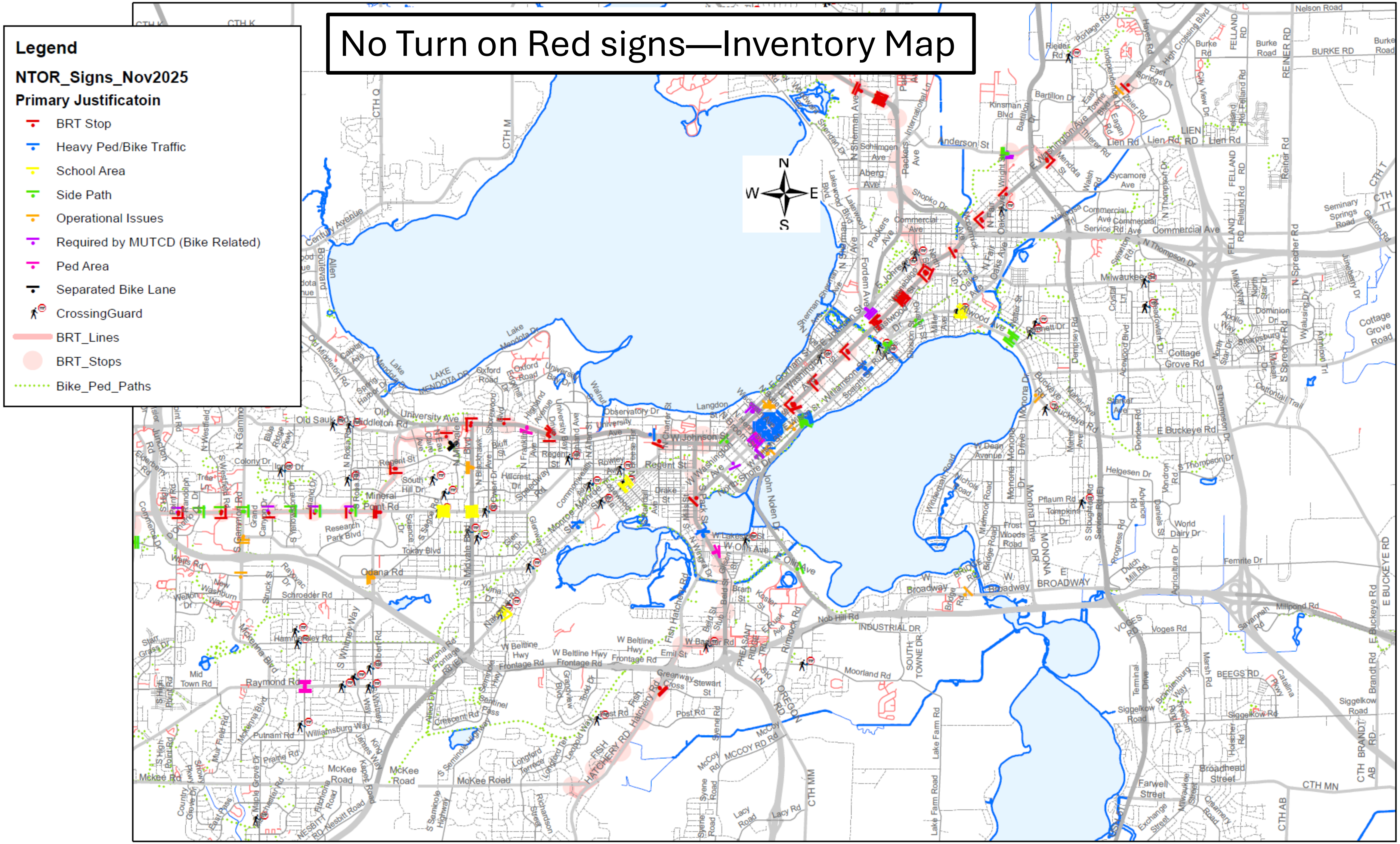
Mineral Point Road—Side Path

- Four NTOR restrictions are required by MUTCD (2-stage bike boxes)
- Design team also installed NTOR at each location along Mineral Point Road where a right turn on red would cross the side path (9 new restrictions)
- These new restrictions were also installed in Fall 2024

Other reasons for NTOR

- Based on specific complaints/requests and staff review / engineering judgment of:
  - School Areas / School Walk Routes / Crossing Guard Locations
  - Heavy Pedestrian Locations
  - Heavy Bicycle Locations
  - Operational Issues (conflicts with other turning movements, intersection visibility issues, etc.)

No Turn on Red signs—Inventory Map



Primary Justification			No. Of Signs
BRT Stop			**73**
Heavy Ped/Bike Traffic			**50**
	Heavy Pedestrian Traffic	*47*	
	Heavy Ped/Bike Traffic	*3*	
School Area			**29**
Side Path			**27**
Operational Issues			**18**
	Operational Issues, Need to Provide Gaps During Peak Times	*1*	
	Confusing Intersection	*1*	
	Dual Right Turn Lanes	*1*	
	Right Turns Interfering w/Service Rd Intersection Operations	*1*	
	Crosswalk Offset from RTOR Vehicles	*2*	
	Crossing Lanes of Moving Traffic	*6*	
	Right Turns Facing Opposing Dual Left Turns	*6*	
Required by MUTCD (Bike Related)			**19**
	Separated Bike Lane	*2*	
	Side Path with Bike Signals	*3*	
	Two Stage Bike Turn Box	*14*	
Unusual Pedestrian Area			**12**
Separated Bike Lane			**2**
	Total		**230**

Next Steps

- Continue evaluating requests using engineering judgment
- Review recently installed corridor-wide restrictions to determine whether modifications or time-of-day restrictions are appropriate
- Improve visibility and consistency of existing NTOR signs
- Consider time-of-day restrictions where appropriate
- Continue balancing pedestrian safety and traffic operations

Discussion