

WATERTOWN-CAMBRIDGE GREENWAY CROSSING

Arlington St. & Nichols Ave. & Crawford St. & Coolidge Hill Rd.

Watertown Bicycle & Pedestrian Committee | October 6, 2025

AGENDA

- Background & Planning Context
- Current Design & Usage Patterns
- Local Feedback
- Safety Issues: Intersection Traffic Operations
- Safety Issues: Roadway Geometry
- Quick Build Improvement Ideas
- Infrastructure Examples: Signalized Diagonal Path Crossings

Appendix: Count Data

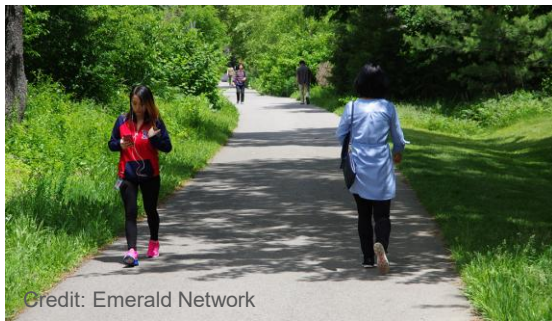
Location Background & Planning Context

Watertown-Cambridge Greenway

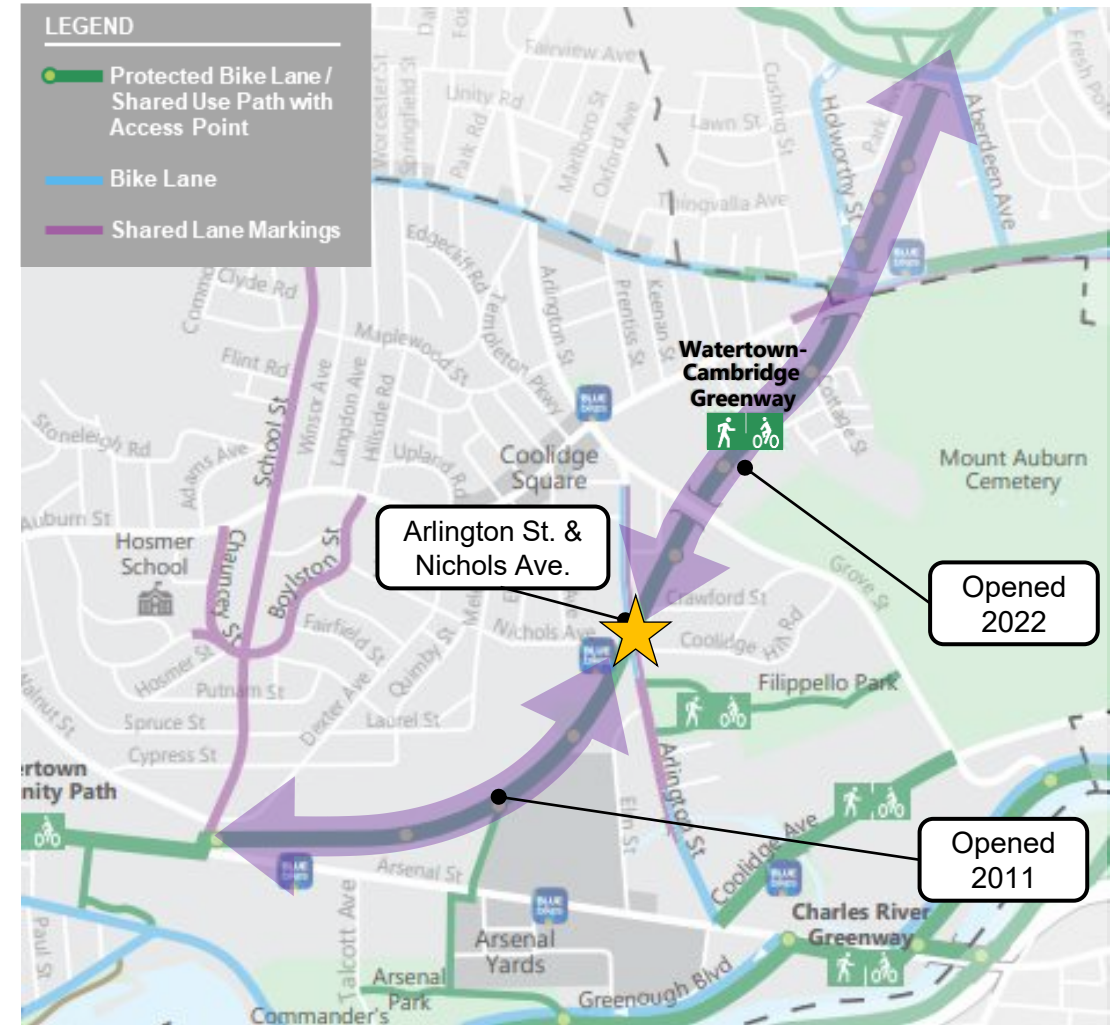
- **Key spine** in Watertown's active transportation network, used by people of all ages & abilities for commuting, recreation, & everyday trips

Arlington St. & Nichols Ave. Intersection

- **Connects two greenway segments** constructed 10+ years apart; but intersection wasn't fully rebuilt at during greenway construction
- **At-grade signalized crossing** & popular greenway access point
- Path crossing overlaps with **busy vehicular traffic** at 5-leg intersection
- Path crossing overlaps with **busy vehicular traffic** at 5-leg intersection
- [Watertown Bicycle & Pedestrian Plan](#) (2021) recommended safety improvements: adding curb extensions, widening sidewalks, & reviewing signals & turn lanes



Watertown Bike Map



Current Design & Usage Patterns

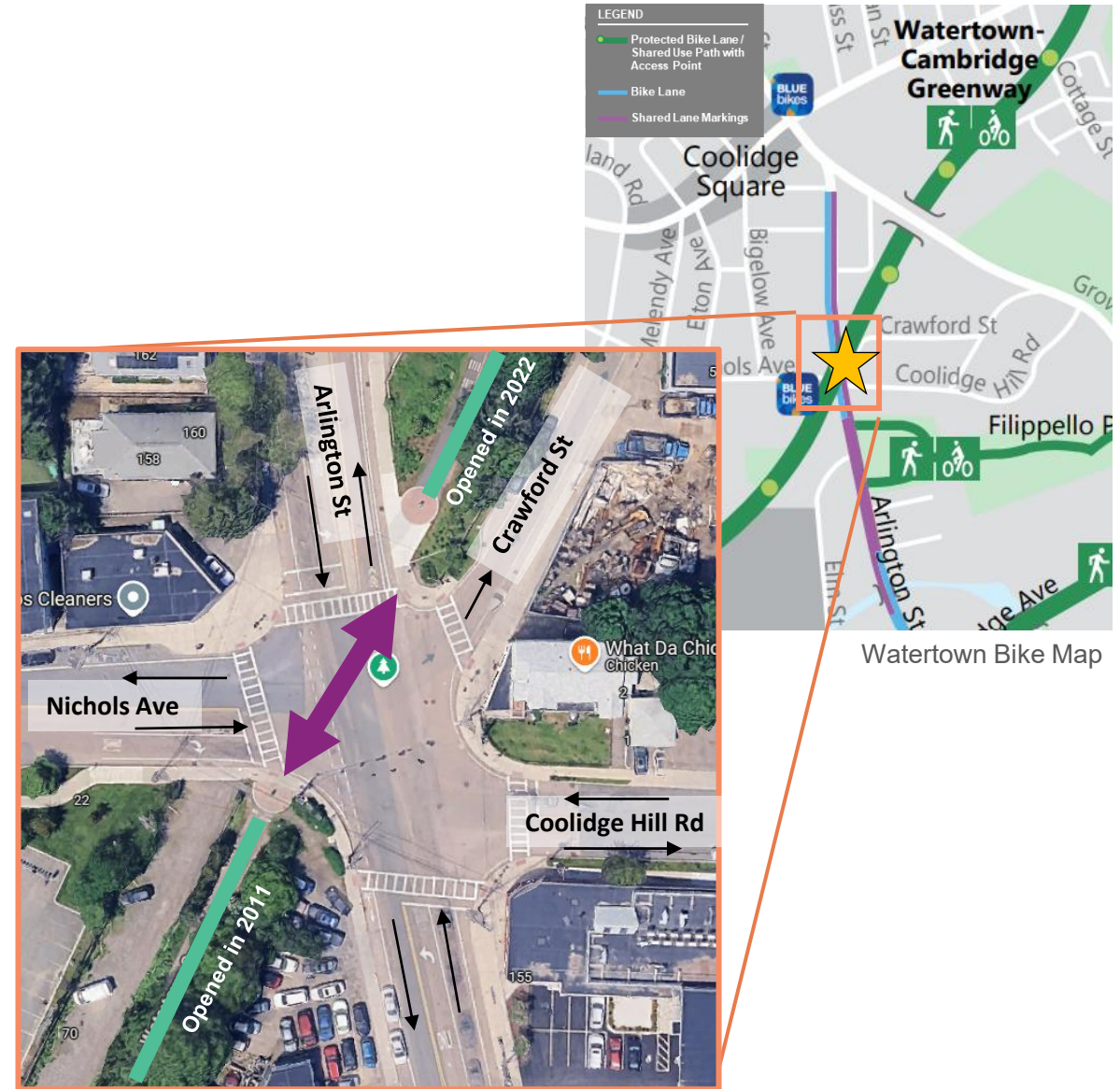
Greenway use is increasing with both segments open

- **1400-1500 daily greenway trips** estimated on typical weekdays (MAPC)
- Arlington St. to Cottage St. is the busiest greenway segment (MAPC)
- **88-198 walk/bike/roll crossings per hour** counted in peak hours (WBPC)

Bike-Ped Committee members conducted spot counts to see how people currently navigate the intersection

- **Crossing diagonally** was the most common crossing pattern for people walking/biking/rolling (**45% of crossings** on average)
- Intersection is **not currently designed to accommodate this** movement, and has a long diagonal desire line (~95') between segments
- Vehicle drivers observed **illegally turning right on red** during walk phases

Counts were collected during Spring 2025 weekday AM/midday/PM peak hours, and one weekend midday peak hour Summer 2025. See appendix for full count details & count summary diagram. 360 degree video of evening peak hour count [here](#).



Local Feedback – Surveys

Surveys Conducted August-September 2025:

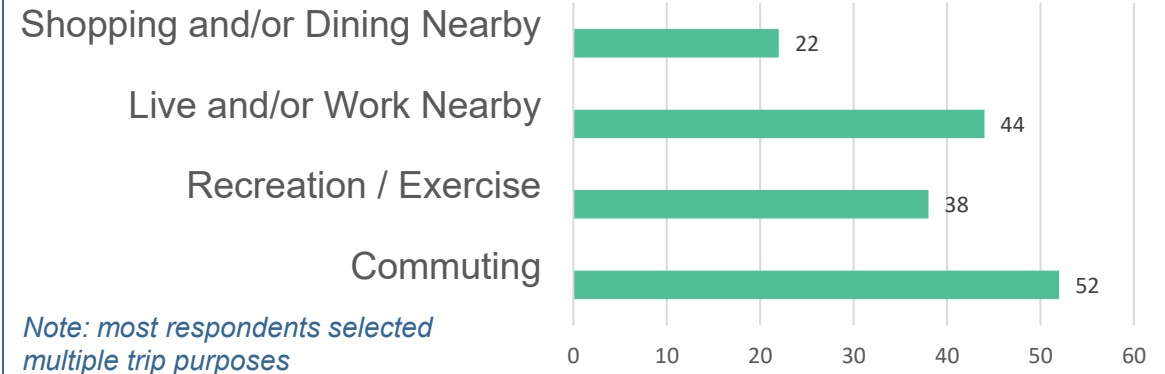
- **Farmer’s Market (8/13/25)** paper surveys at Bike Ped Committee Table
- **Online Survey (9/9/25 – 9/26/25):** flyer posted at corners of the Arlington St./Nichols Ave. intersection with survey link
- 86 total responses

Survey Questions:

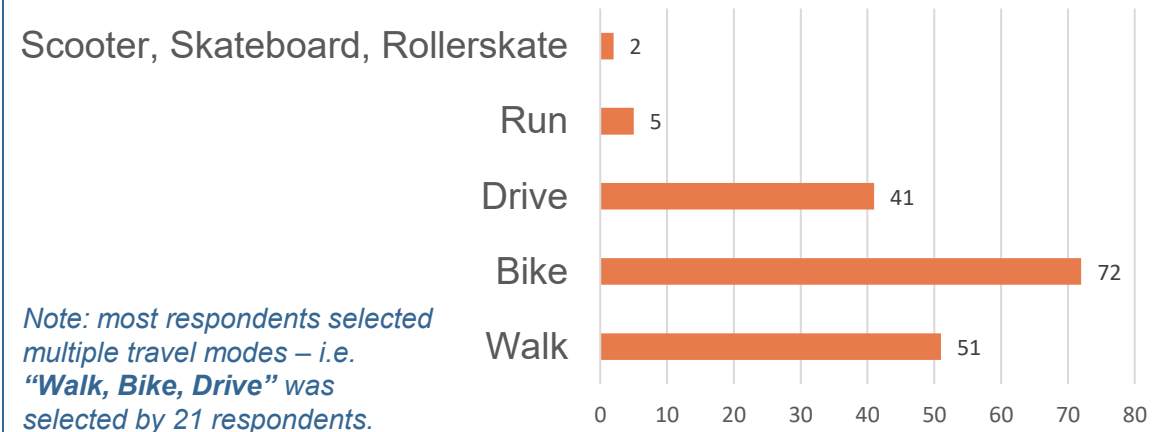
1. What is your reason for traveling through this intersection? (Select multiple)
2. How do you travel through this intersection? (Select multiple)
3. What is your biggest concern with this intersection? (Fill in)
4. Is there anything that you’d like to see changed in this intersection, if so – what? (Fill in)

See slide 9 for summary of response themes for questions #3 & 4

1. What is your reason for traveling through this intersection? (Select all that apply)



2. How do you travel through this intersection? (Select all that apply)



Safety Issues: Roadway Geometry

Curb Ramps & Sidewalks:

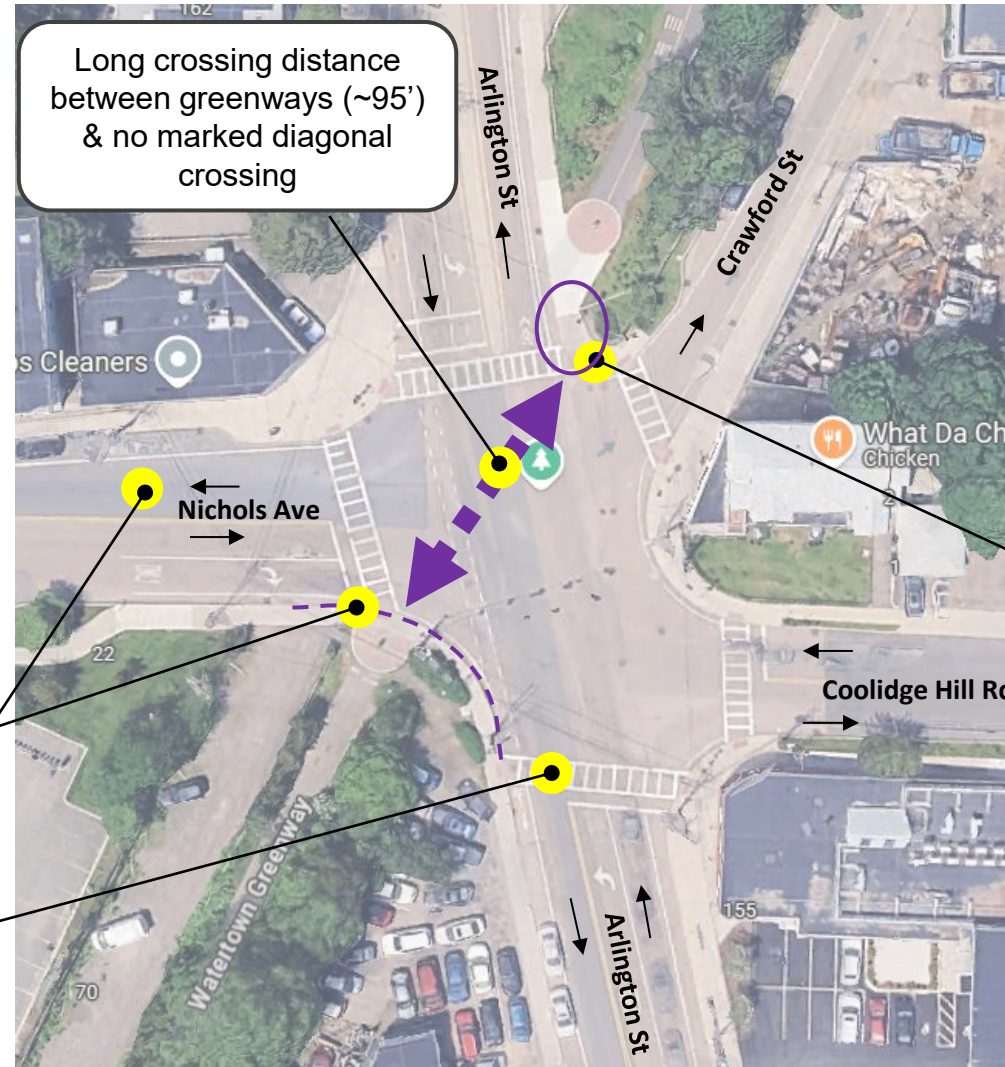
- Sidewalks & ramps Not Wide Enough - Pinch Points for People Walking/Biking/Rolling
- Ramps misaligned with Greenway Entry

Roadway Layout:

- Long Crossing Distances &
- Wide Traffic Lanes & Corner Radii
- No Bike Crossing Markings - Unclear for People Biking/Rolling how/where to cross

Wide travel lanes & wide turning radii at corners allow for faster vehicular turns

South crosswalk is set back far from Nichols Ave. & visibility is obscured for right turning vehicle drivers



Long crossing distance between greenways (~95') & no marked diagonal crossing

Standard pedestrian ramps not wide enough for bikes to share with pedestrians to access greenway (especially constrained for cargo bikes)



~4' pinch point – constrained for bikes/peds passing each other to access greenway

Ramps are aligned with crosswalks, but not quite with greenway entrances

Safety Issues: Intersection Traffic Operations

Signal Timing & Phasing:

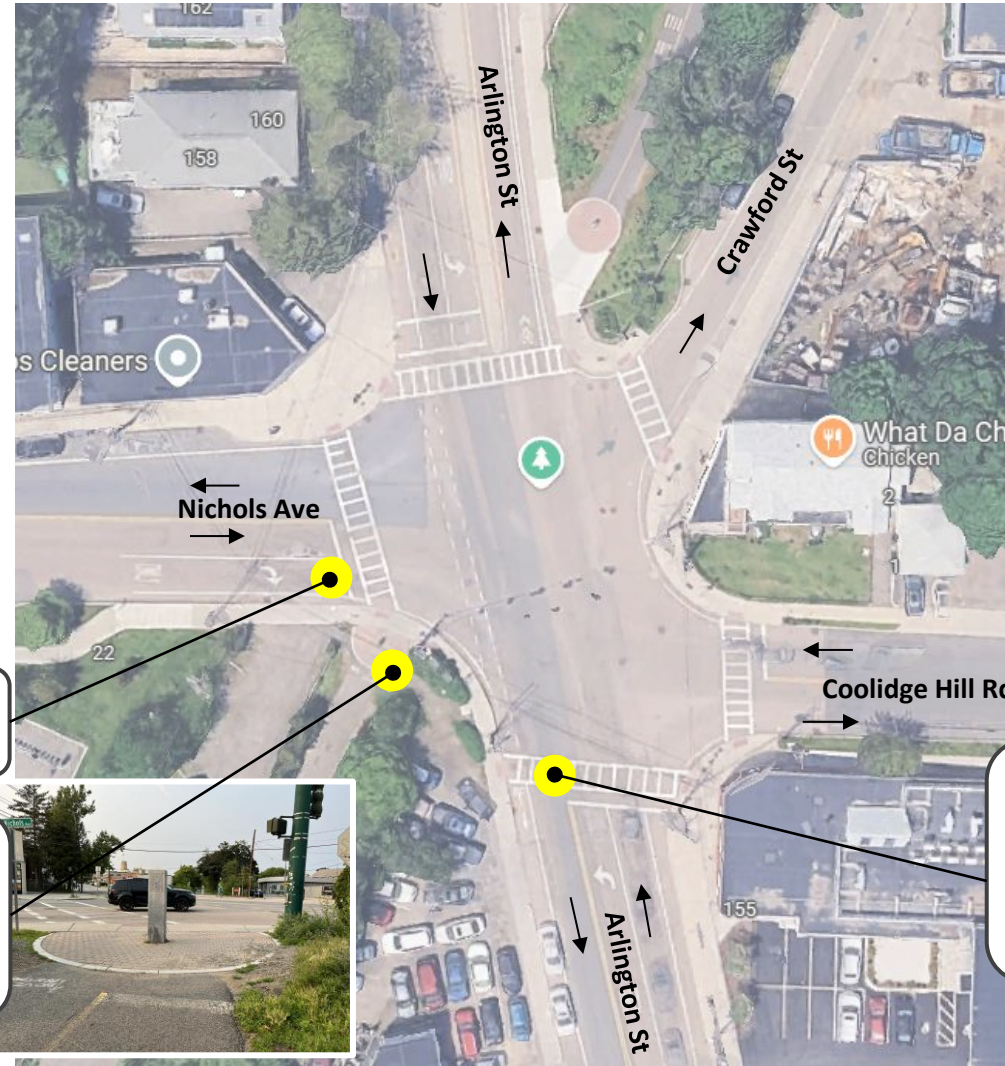
- Not Enough Walk Crossing Time
- Long Wait Times

Signal Infrastructure:

- Unclear for Cyclists how to cross or request signal - No Bike Crossing Signal / Signage

Right Turn on Red Restriction:

- Driver Compliance is Inconsistent



Limited visibility of "No Turn on Red" far-side sign, no near-side sign



Vehicle driver compliance issues with "No Turn on Red"

Not clear how to cross intersection from greenway to greenway when rolling/biking – lack of signage and/or signal heads visible at greenway exits

Obscured visibility of Arlington St. crosswalk from Nichols Ave. a more pressing safety issue when "No Turn on Red" isn't followed

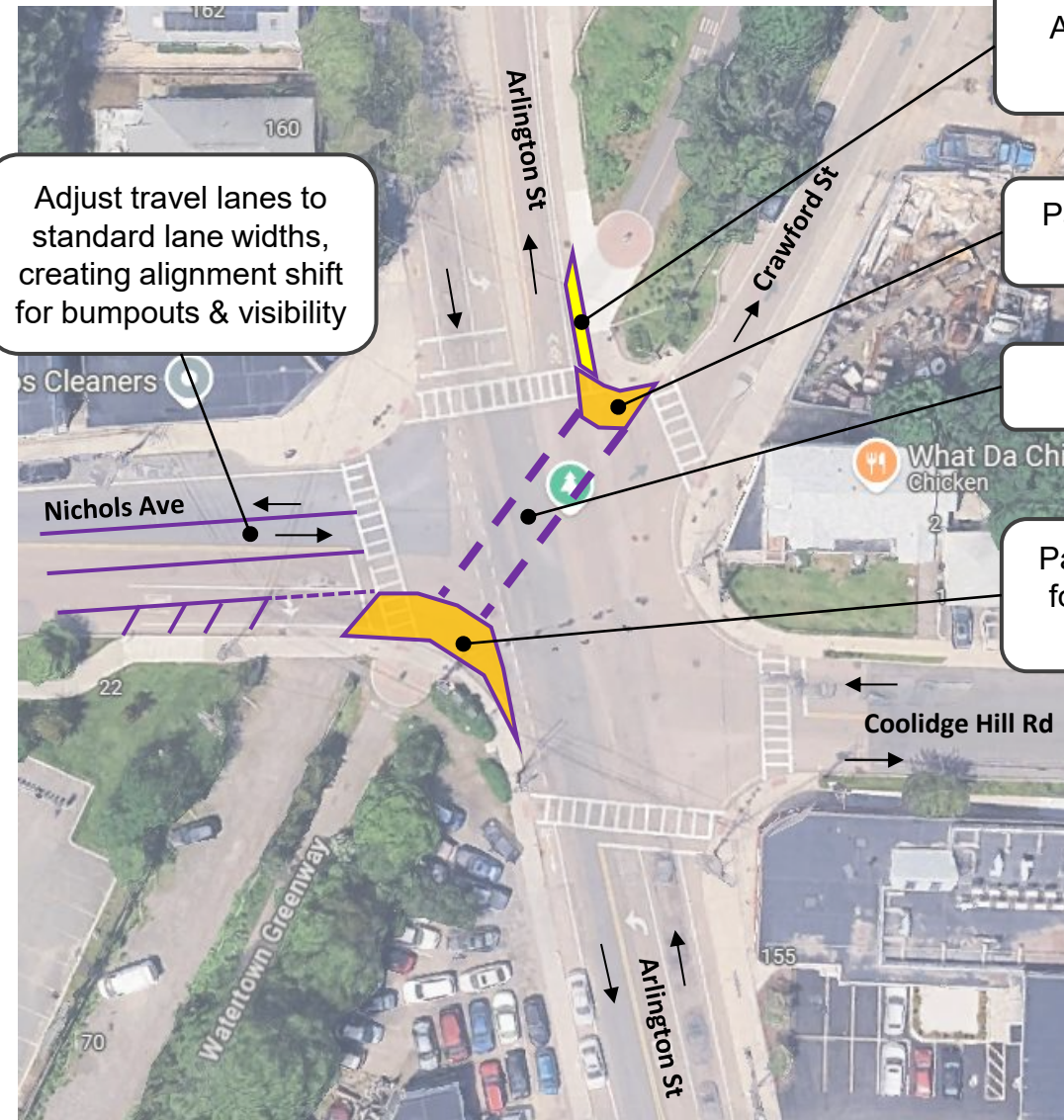
Quick Build Interim Safety Improvement Ideas

Potential Focus Areas

- Extend Walk Time
- Formalize Diagonal Crossing
- Alleviate Pinch Points at Ramps
- Shorten Crossing Distances / Adjust Travel Lanes

Summary & Safety Benefits

- **Signals** – Extend walk phase time & consider camera detection to give path users enough time to cross
- **Tighter Curb Radii** - Slower turns for vehicles around corner and better sight distance
- **Curb Extensions** - Shorter pedestrian & path crossing and increased path user visibility
- **Lane Delineation** - Narrowed travel lanes to encourage slower speeds, clear space allocation
- **Formalize diagonal path crossing** - Raises awareness of path users, guides them through intersections, makes movements more predictable



Local Feedback – Themes in Survey Responses

Concerns with this intersection (% of theme mentions)

- **Walk Signal / Crossing (52%)** - not enough time to cross diagonally, otherwise wait times are too long - multiple cycles to cross
- **Safety – Bike/Ped (45%)**– conflicts car drivers pose to greenway users, & conflicts between path users at narrow greenway entrances
- **Safety - Right on Red (17%)** – car drivers running red lights/illegally turning right on red (Nicholls to Arlington) during walk phase
- **Confusion & How to Navigate (11%)** - where/when should bikes cross, and when/where to expect cars to approach from? Nicholls EB is confusing for drivers too
- **Narrow Ramps & Sidewalks (9%)** at greenway entrances: narrow and misaligned ramps, combined with narrow sidewalks with light poles, cause weaving of cyclists around pedestrians & conflict points

“Very hard to cross with stroller-- not enough time to get across. Hard to tell where the Greenway connects. Dangerous for pedestrians and bikers!”

“There’s no priority for bike and pedestrians and so we have to wait longer than the cars”

Suggestions for changes (% of theme mentions)

- **Longer Crossing Signal (27%)** – range of +4 to +30 seconds requested
- **More Frequent Crossing Signal (9%)** - for multi phase crossings
- **Diagonal Greenway Crossing Markings (16%)** – clarify where to travel
- **Diagonal Greenway Signal (13%)** – some mentioned bike-only, some requested automatic or camera detection
- **Wider Curb Cuts (12%)** – align with greenway & address pinch points
- **More Space at Corners (5%)** – to reduce bike/ped conflicts at entrances
- **Bike Boxes & Upgraded Bike Lanes (6%)**
- **Roundabout, Raised Table, Connect to Filipello Park**

“I really want a marked crossing and dedicated portion of the light cycle for the bike path, with crossing indicators facing both directions on the path.”

“Bigger curb cut for bike path. Longer pedestrian light to cross diagonal connecting the bike path as well as a diagonal cross walk painted on the ground.”

Quick Build Bump-outs: Photo Examples

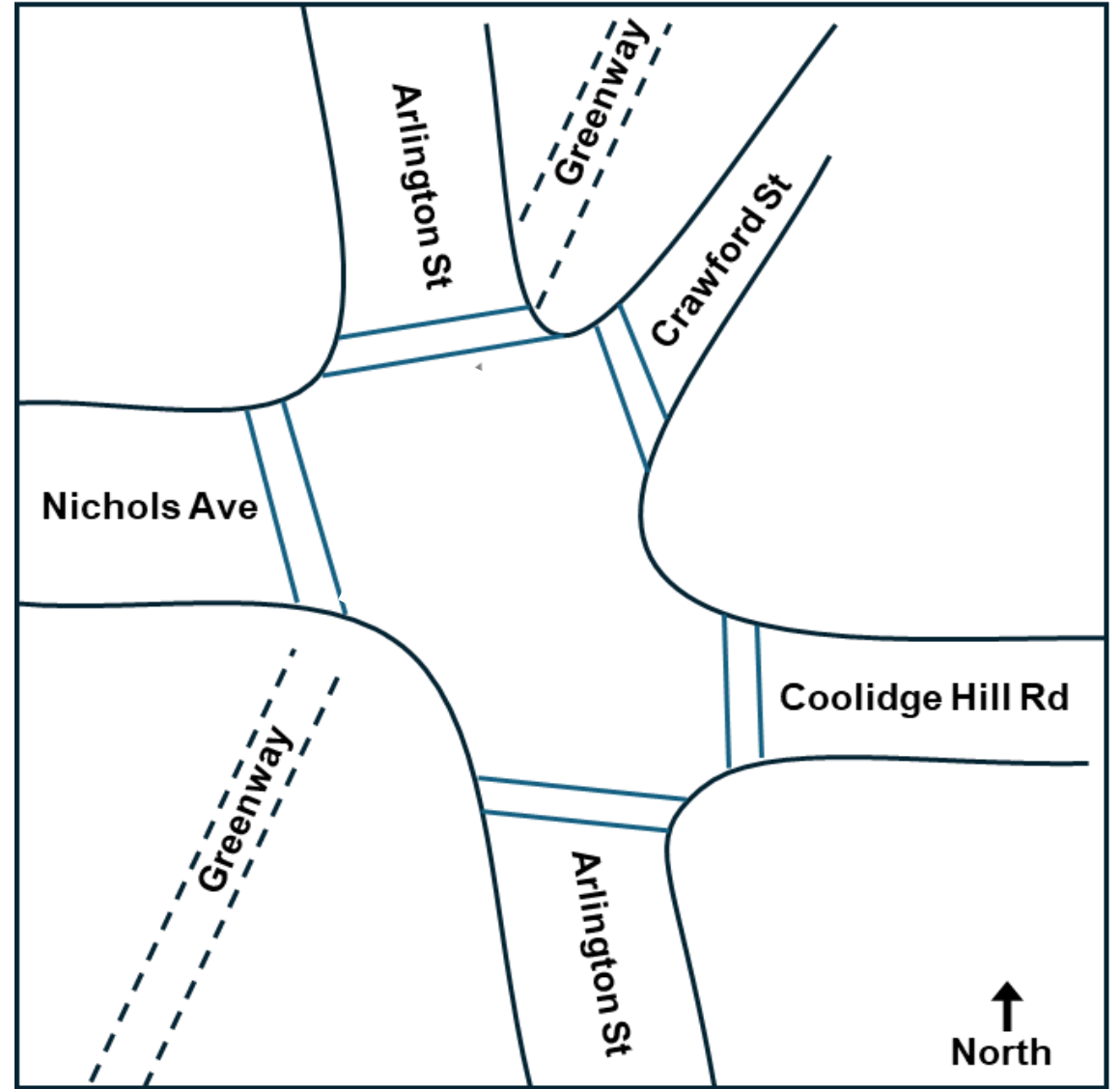
Temporary curb extensions in paint & vertical elements (i.e. flex posts, planters, bike racks, etc.), benefits include:

- Shorten crossing distances & improved visibility between drivers & peds
- Expand waiting areas for bikes/peds
- Realign travel lanes & corner radii to calm turning vehicles
- Test out a temporary configuration



Bumpouts with flex posts – [California St. at Chapel St., Newton](#)

Blank Map Slide – For Discussion / Sketching



Diagonal Path Crossings Through Signalized Intersections: Infrastructure Examples

*Crowdsourced from Association for Pedestrian &
Bicycle Professionals Message Board*

Examples from:

- Cambridge, MA / MassDOT PDDG
- Dunwoody, GA
- Eugene, OR
- Corvallis, OR
- Madison, WI
- Minneapolis, MN
- Portland, OR
- Washington, DC

Overview - Diagonal Path Crossing Examples

Diagonal trail and shared use path crossings through signalized intersections are not very common in this area. We reached out to other planners and engineers in the [APBP](#) network (Association of Pedestrian and Bicycle Professionals) to learn about any examples in cities and towns outside of Greater Boston.

The following slides illustrate a wide range of diagonal crossings of shared use paths and bikeways with a summary of signal activation methods, phasing, infrastructure for each. Respondents included detailed notes in some cases, along with links to Google Streetview. While this is a collection and not representative sample, a few trends emerged:

- **Signal activation:** mostly either push button or camera detection
- **Signal phasing:** some are included during all-ped phases, and in some cases diagonal crossings run on a separate phase from crosswalks and all other movements
- **Signal heads:** diagonal facing signal heads are common – typically a bike or ped signal, or in some cases, both
- **Roadway markings:** wide variation of markings including typical crosswalk, green bike crossing marking, or pavers to indicate where path users should travel and to alert motorists to expect diagonal path crossings

MassDOT Project Development and Design Guide

Path Intersection Crossing Guidance from *PDDG Chapter 11 – Shared Use Paths*

“As the path approaches the crossing it should be aligned with the destination of the crossing on the other side of the road. Unless the destination is at a diagonal across the intersection, as shown in **Figure 11-7**, the crossing should also be as perpendicular as possible to the road being crossed. Pedestrian curb ramps that comply with [521 CMR](#) should be appropriately aligned and be the same width as the path (at least 36” plus the side flares). The designer should evaluate Stopping Sight Distance and Intersection Sight Distance and use sound engineering judgment to locate crossings. See “Sight Distance” in this chapter and Chapter 3, [Section 3.7 Sight Distance](#) for appropriate guidance on sight distances.”

Figure 11-7: Example of Diagonal Path Crossing at Signalized Intersection



Cambridge, MA –
Community Path Crossing
Massachusetts Ave. at Cedar St.

PDDG Chapter 11 - Shared Use Paths - Link:
<https://www.mass.gov/info-details/pddg-chapter-11-shared-use-paths>

Source: Nearmap (Aerial), with Annotations by MassDOT

Cambridge, MA – Community Path Crossing

Massachusetts Ave. at Cedar St.

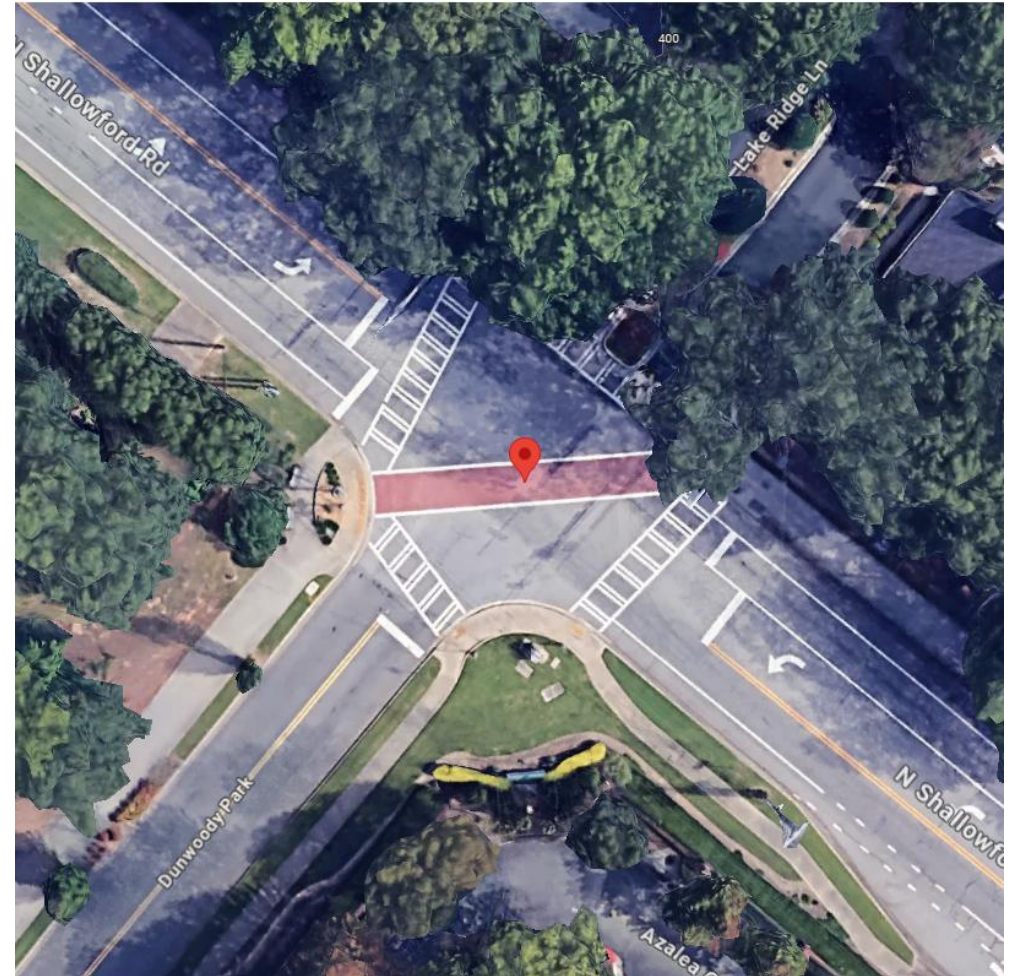
- Signal phasing: diagonal bike crossing on a separate phase from crosswalks (peds cross in 2 stages)
- Signal heads: diagonal facing bike signal heads
- Notes
 - Diagonal bike crossing on separate single phase
 - Peds cross in 2 stages, but not as much pedestrian delay as the Arlington/Nichols intersection as they are on separate phases rather than an all ped phase.
- Google Maps:
<https://maps.app.goo.gl/Tf1e7rPP2duNRre7A>



Dunwoody, GA – Dunwoody Trailway

N. Shallowford Rd. at Dunwoody Park

- Signal activation: push button
- Signal phasing: all ped phase combined w/diagonal
- Signal heads: diagonal facing ped signal heads
- Notes
 - Diagonal shared-use path crossing in Dunwoody, GA (suburb of Atlanta).
 - When the pedestrian button is pressed on either end of the diagonal crossing, the traffic signal responds by providing a phase where it's red in all directions and path users can cross diagonally. There are diagonal-facing pedestrian signal heads for the diagonal movement
 - The perpendicular crossings all get a walk indication when the diagonal one does. Since the diagonal distance is the longest and it's red in all directions anyway, the other crossings get a walk indication, too.
- Google Maps:
<https://maps.app.goo.gl/GP614osKYrxezYiB9>



Eugene, OR – Amazon Active Transportation Corridor

Hilyard St at E 33rd Ave/E. Amazon Dr.

- Signal activation: camera detection holds signal longer if a cyclist is mid-intersection
- Signal phasing: diagonal bike crossing is on separate phase from the crosswalks (which are concurrent w/vehicles)
- Signal heads: diagonal facing bike signal heads
- Notes
 - The bike crossing (which runners also are using because it connects a popular running trail as well) is timed between the N-S and E-W streets and there are no pedestrian crossings at the same time (these run with the motor vehicle signals).
 - The bike signal runs after the N-S street (Hilyard). The E-W street (33rd-E. Amazon Dr) runs AFTER the bike signal to give bit of space in case a crossing cyclist needs a bit more time, though there are cameras that help hold the signal longer if there's a cyclist in the intersection.
 - We don't run any pedestrian signals at the same time because the crossing time can be kept short for the cyclists (as they move faster) versus the pedestrian timer which needs more (three of the legs are pretty wide).
- Links
 - Video of crossing on Project Site [Amazon Active Transportation Corridor | Eugene, OR Website](#)
 - Google Maps: <https://www.google.com/maps/@44.0210488,-123.0817137,118m/data=!3m1!1e3>



Corvallis, OR

SW Avery Ave. and Crystal Lake Dr. at Pacific Hwy W / Rt. 99W

- Signal activation: camera detection
- Signal phasing: on separate phase from crosswalks
- Signal heads: diagonal facing bike signal heads
- Notes
 - Connects from a shared use path at the NE corner and points one to a bike lane at the SW corner via a bike-signalized intersection.
 - One item to note is that our crossing does not have the diagonal markings as the Oregon Department of Transportation (ODOT) decided not to install those out of confusion for too many markings at the NE corner of the intersection.
 - This was a primarily an ODOT project but one that had strong City input.
- Links
 - Google Maps: https://www.google.com/maps/@44.5519186,-123.2652004,47m/data=!3m1!1e3?entry=ttu&g_ep=EgoyMDI1MDQwOC4wIKXMDSOASAFQAw%3D%3D
 - I strongly suggest [checking out this excellent video](#) put out by my incredible ODOT counterpart, Jenna Berman, giving a full overview of the crossing.



Madison, WI – Capital City Path (3 Crossings)

Cottage Grove & Dempsey, Atwood & Dunning, Williamson & Blount

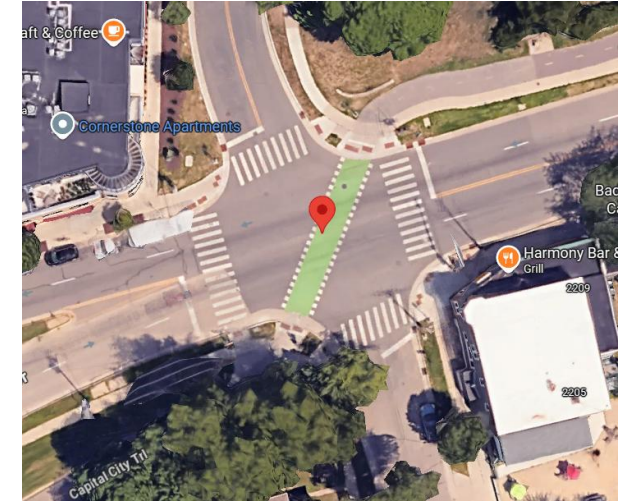
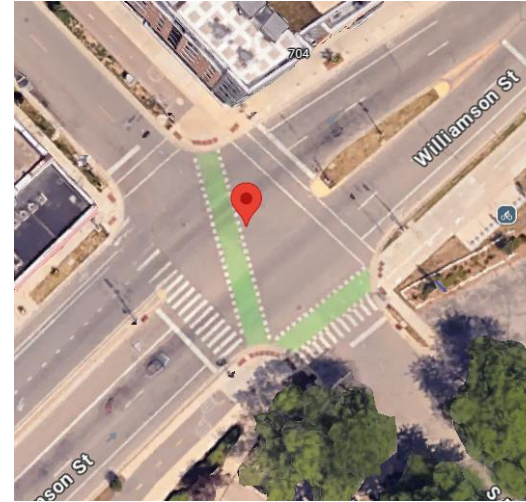
- Signal activation: on recall
- Signal phasing: diagonal bike & crosswalks run concurrently
- Signal heads: diagonal facing bike signal heads

Three diagonal SUP/bike crossings at signalized intersections that all operate similarly:

- [Cottage Grove & Dempsey](#) - Note that this location now has a green crossing and 4" near side bike signals not shown in Google
- [Atwood & Dunning](#)
- [Williamson & Blount](#)

All three are part of the Capital City Path. At all three crossing locations:

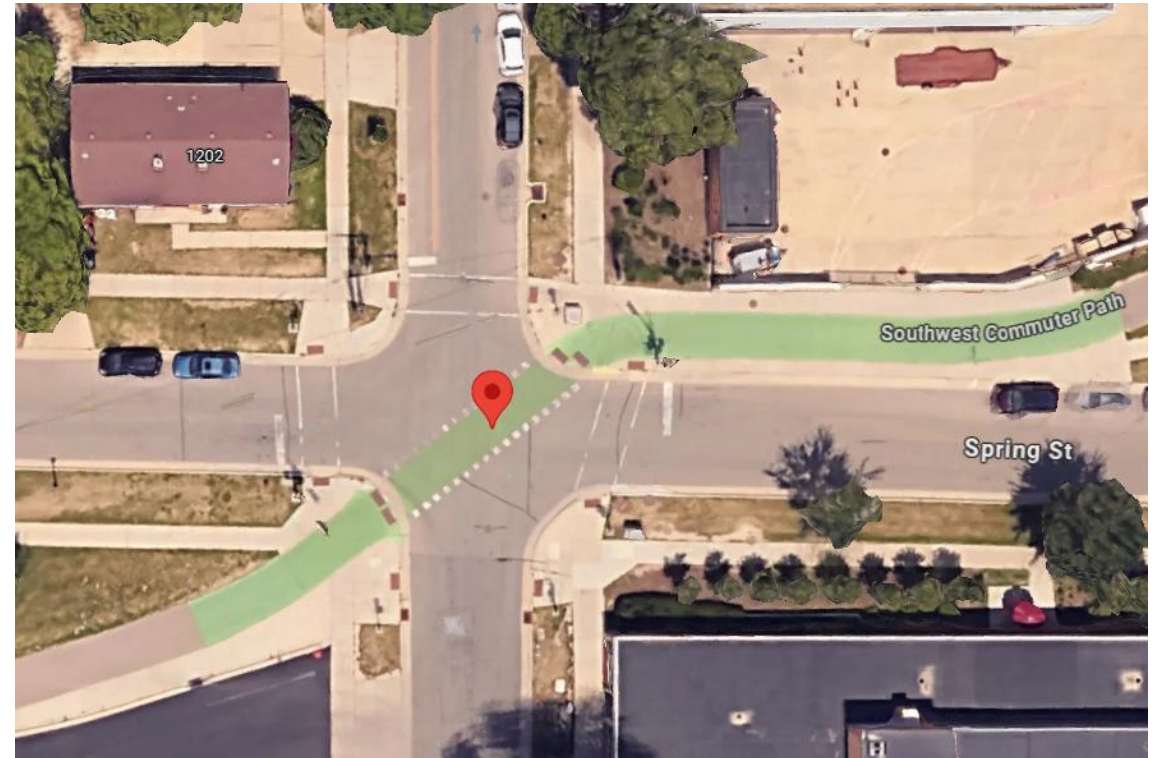
- The diagonal crossing is signalized for bikes; pedestrians are directed to use the standard crosswalks. This allows running a shorter diagonal signal timing as you can use bike crossing speeds and not the slower pedestrian speeds. That said, some pedestrians use the diagonal crossings, especially runners who are moving a bit quicker
- I believe all of these locations are on recall for the bike and pedestrian crossings. The cycle runs so that mainline traffic is stopped and the diagonal bike and perpendicular ped signals come up; the bike signal ends and crossing traffic is given a green while the ped signal wraps up. So effectively there is a really long leading pedestrian phase.
- We have begun to install 4" near-side bike signals mounted ~5' off the ground for better visibility of the bike signals for bicyclists.



Madison, WI – Southwest Commuter Path

Spring St. at Charter St.

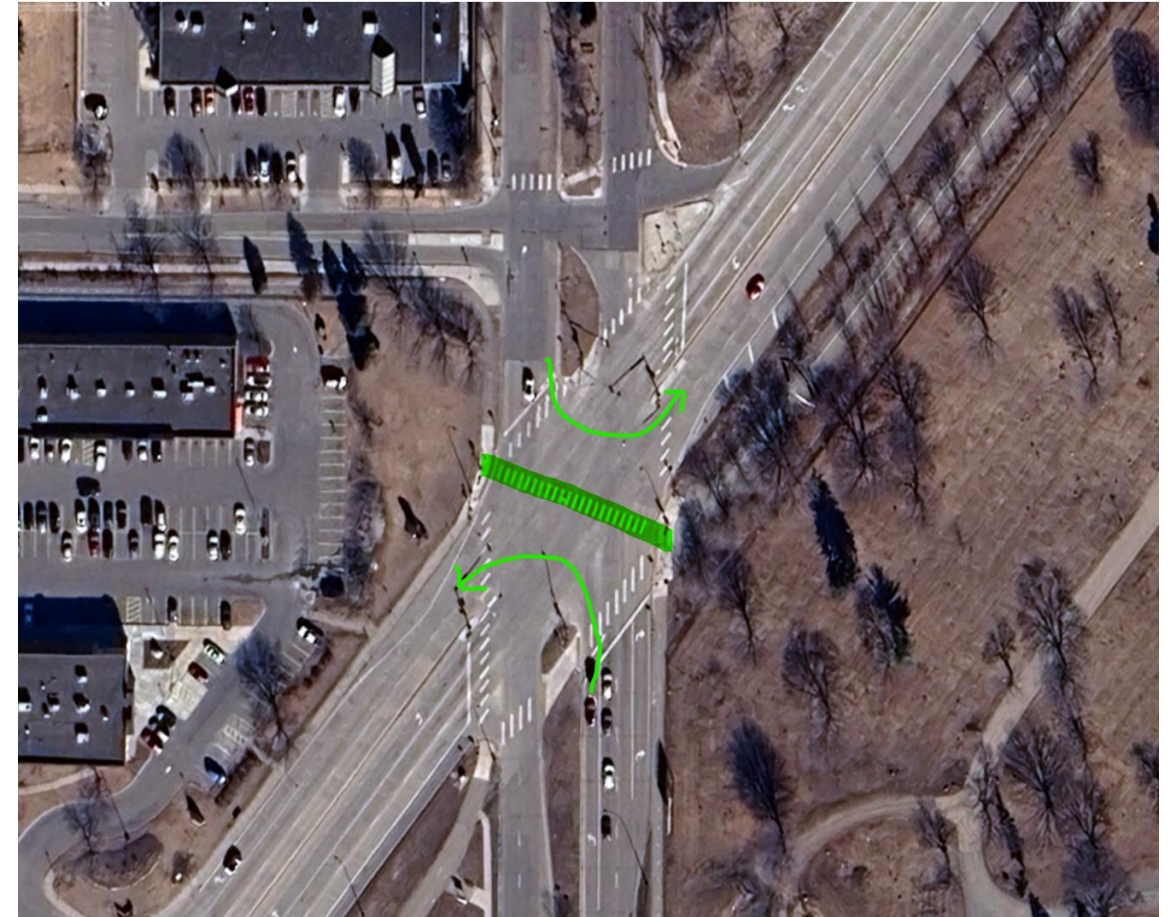
- Signal activation: rests on green for path users & walk for crosswalks – passive camera detection for vehicles which arrive on red and must wait
- Signal phasing: 2 phases: path/crosswalks concurrent, vehicles only when detected
- Signal heads: diagonal facing bike signal heads
- Notes
 - This one is significant because the traffic signal defaults to green for path users.
 - In other words, if a car approaches from any direction, it's passively detected and has to wait for a green phase before it can proceed, rather than path users approaching a red and either being detected (or having to push a beg button) and waiting for green to proceed.
 - This signal rests in the condition of the diagonal crossing and all crosswalks having green/walk, and all motor vehicle signals being red. It is only when a motor vehicle is detected that the signal provides a green for traffic.
 - This is a crossing of two minor streets. At this location, the diagonal is for bikes and peds.
- Google Maps: <https://maps.app.goo.gl/BLAZoyShuMQd9R4w5>



Minneapolis, MN – Minneapolis Diagonal Trail

Grand Rounds Scenic Bwy at New Brighton Blvd.

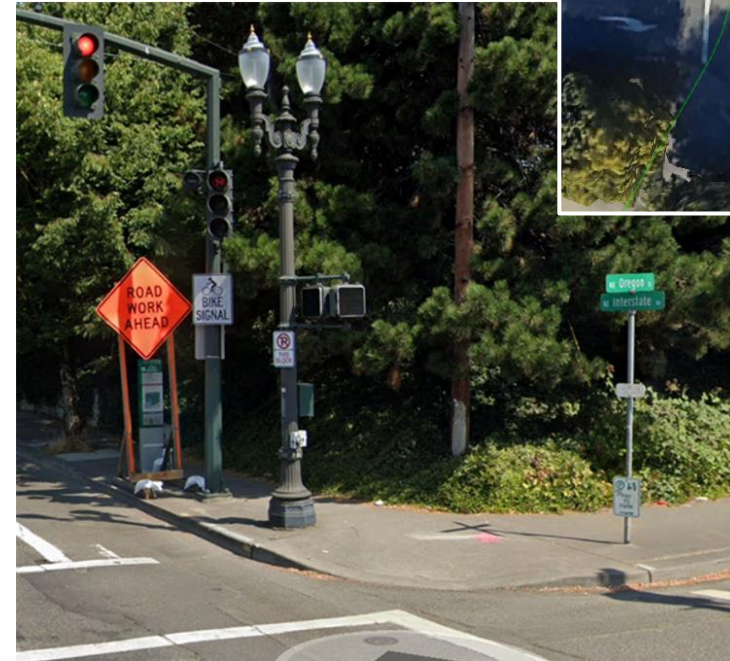
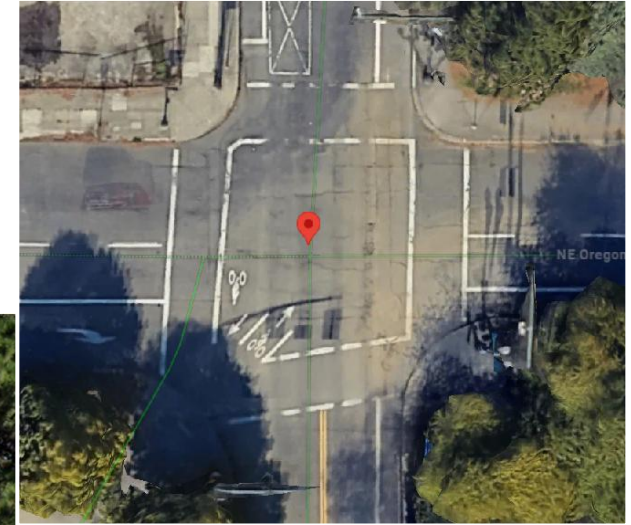
- Signal activation: push button
- Signal phasing: diagonal bike/ped crossing concurrent with protected left turn phases
- Signal heads: diagonal facing bike & ped signal heads
- Notes
 - It was just resurfaced, restriped, and ramps brought up to current ADA last year so the google maps condition is slightly older.
 - The diagonal crossing is marked similar to all the other crossings with continental bars.
 - The signal timing is for bikes and peds and works really well when you time it out right, but can be a long wait if you miss a cycle. I've tried to illustrate below when the walk/bike phase is on.
 - Because of the skew of this intersection, the walk phase is concurrent with the protected left phase of the north-south road (Stinson).
 - One thing missing here is a no turn on red prohibition. Most often the right turners are not expecting to check for people walking and biking at the diagonal crossing.
- Google Maps:
https://www.google.com/maps/@45.0055314,-93.2266706,186m/data=!3m1!1e3?entry=ttu&g_ep=EgoYMDI1MDQwOS4wIKXMDSoASAFQAw%3D%3D



Portland, OR – Peace Memorial Park

NE Lloyd Blvd at NE Oregon St/Route 99W

- Signal activation: push button
- Signal phasing: separate from vehicular phases, not confirmed whether separate from ped crosswalk phases.
- Signal heads: diagonal facing bike signal head
- Notes
 - [Intersection in Portland, Oregon](#), that uses a dedicated bike signal phase to allow diagonal bicycle crossings.
 - The markings are faded, so it is difficult to see clearly, but the dedicated bike signal is visible
 - It has a dedicated phase from motorized traffic, though I am not sure if it is independent of pedestrian movements; it likely depends on conflicts. If I recall correctly, this used a push button, but others used detection.
- Google Maps:
<https://maps.app.goo.gl/kHaFt7BtSsNBPVUi7>



Washington, D.C.

16th St. NW at U St. NW & New Hampshire Ave. NW

- Signal activation: loop detector originally
- Signal phasing: separate phase for bikes to cross into bike box to access the typical crossing on each leg
- Signal heads: diagonal facing bike signal heads
- Notes
 - Despite having 6 legs, the intersection signal timing and phasing before the addition of bike lanes on the diagonal had been relatively simple because both diagonal legs of New Hampshire are one-way away from the intersection.
 - The addition of contra-flow bike lanes in each direction approaching the signal allowed bicyclists to advance to the bike box before crossing ahead of car traffic instead of having to take two consecutive crosswalks at right angles.
- Links:
 - 2-minute YouTube video illustrating the operation is here (2010 project): [Bike Traffic Signals](#)
 - [Google Maps: 38.917021, -77.036555](#)
 - [Street View · Google Maps](#)





Thank you!

bikeped@watertown-ma.gov

Greenway Crossing Counts - Summary

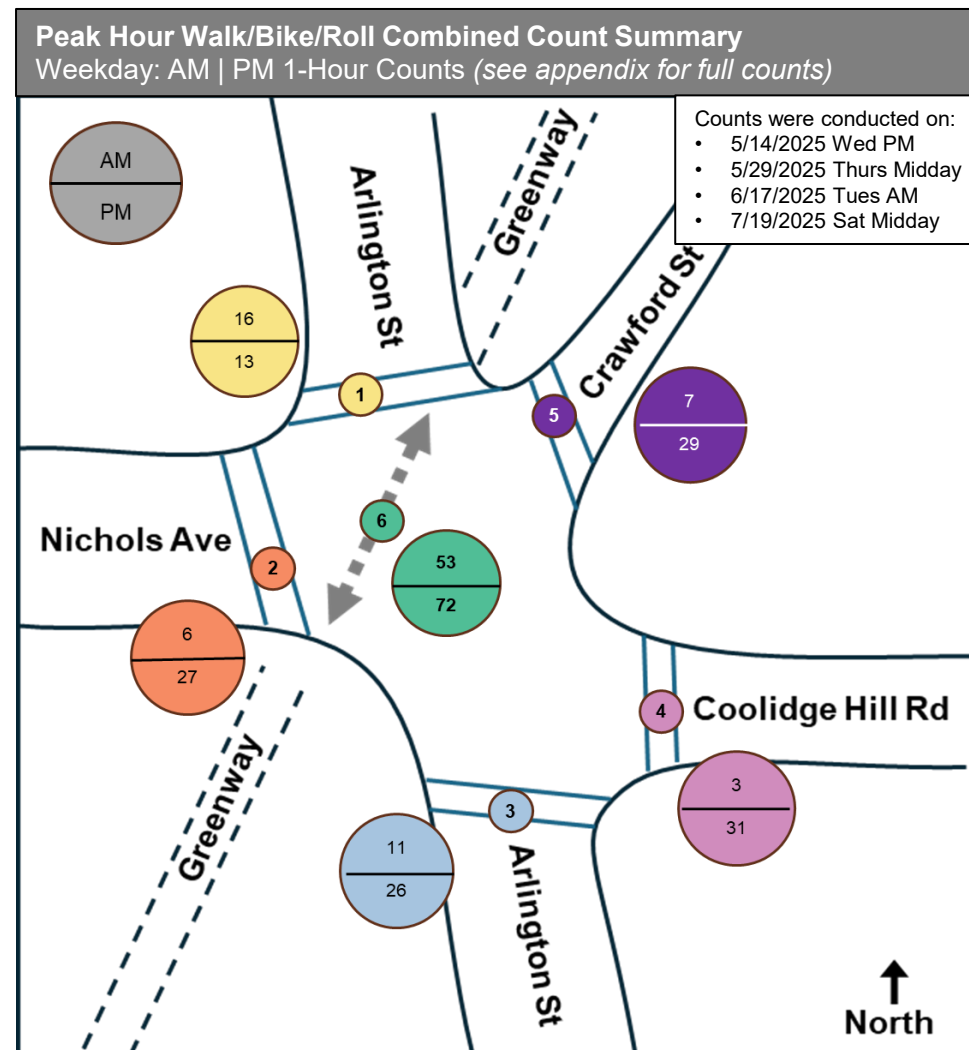
Bike-Ped Committee members conducted spot counts to see how people currently navigate the intersection

Key Takeaways

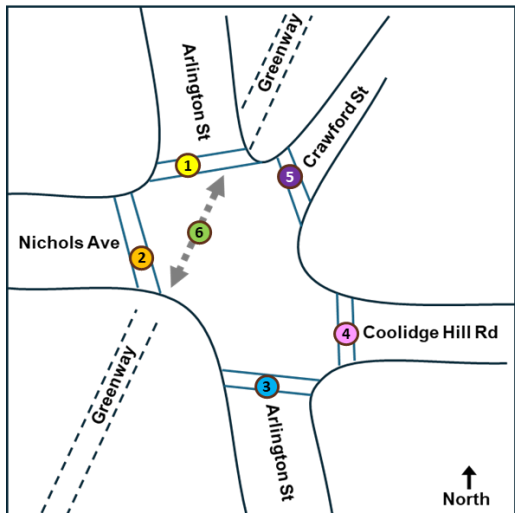
- On average **45% of intersection crossings were made diagonally**, even though it is not currently designed to accommodate this movement
- **88 to 198 total crossings per hour** were observed through the intersection (crossings on all intersection legs)
- Diagonal crossing was typically the most common crossing made by both bicyclists **and** pedestrians, demonstrating a desire line for all active transportation modes

Behavioral & User Experience Observations

- Vehicle drivers made illegal right turns on red during walk phases
- Cargo bikes need to squeeze by the signal/light pole, as the curb ramp isn't in the correct place for the northern entrance to the Greenway
- 25% of users were too impatient to wait for the walk signal. Sometimes wait times are significant (note from Saturday count)
- 10% of people didn't realize they had to request the walk signal (note from Saturday count)



Greenway Crossing Counts – All Data



Weekday AM Peak												
Date	6/17/2025											
Day	Tuesday											
Time (Start/End)	7:45 - 8:45 AM											
Observer	Eileen											
Temperature	62 F											
Weather Conditions	Overcast											
Time	#1 Arlington St (North Leg)		#2 Nichols Ave		#3 Arlington St (South Leg)		#4 Coolidge Hill Rd		#5 Crawford St		#6 Diagonal Crossing	
	Walk	Bike / Roll	Walk	Bike / Roll	Walk	Bike / Roll	Walk	Bike / Roll	Walk	Bike / Roll	Walk	Bike / Roll
7:45 AM	2	1	1	0	3	0	0	0	0	0	2	8
8:00 AM	1	5	0	2	1	0	0	0	1	0	2	8
8:15 AM	1	0	1	0	2	0	1	1	2	2	3	15
8:30 AM	3	3	0	2	5	0	1	0	2	0	3	12
Total:	7	9	2	4	11	0	2	1	5	2	10	43
Total:	16		6		11		3		7		53	
% Total	17%		6%		11%		3%		7%		55%	

Weekday PM Peak												
Date	5/14/2025											
Day	Wednesday											
Time (Start/End)	4:28 - 5:29 PM											
Observer	Jenny											
Temperature	73 F											
Weather Conditions	Sunny											
Time	#1 Arlington St (North Leg)		#2 Nichols Ave		#3 Arlington St (South Leg)		#4 Coolidge Hill Rd		#5 Crawford St		#6 Diagonal Crossing	
	Walk	Bike / Roll	Walk	Bike / Roll	Walk	Bike / Roll	Walk	Bike / Roll	Walk	Bike / Roll	Walk	Bike / Roll
4:28	0	3	2	2	6	1	4	3	4	3	2	16
4:43	1	4	4	3	4	3	2	4	2	3	7	9
4:59	1	2	5	2	2	0	4	6	3	6	8	13
5:14	1	1	8	1	4	6	2	6	3	5	4	13
Total:	3	10	19	8	16	10	12	19	12	17	21	51
Total:	13		27		26		31		29		72	
% Total	7%		14%		13%		16%		15%		36%	

Weekday Midday Peak												
Date	5/29/2025											
Day	Thursday											
Time (Start/End)	2:00 - 3:00 PM											
Observer	Jamie											
Temperature	67											
Weather Conditions	Overcast											
Time	#1 Arlington St (North Leg)		#2 Nichols Ave		#3 Arlington St (South Leg)		#4 Coolidge Hill Rd		#5 Crawford St		#6 Diagonal Crossing	
	Walk	Bike / Roll	Walk	Bike / Roll	Walk	Bike / Roll	Walk	Bike / Roll	Walk	Bike / Roll	Walk	Bike / Roll
2:00	2	0	2	0	1	0	0	0	1	0	1	2
2:15	2	0	1	0	1	0	2	1	3	1	2	5
2:30	2	0	7	1	3	0	0	1	7	1	1	8
2:45	3	2	2	0	0	0	5	0	5	0	2	11
Total:	9	2	12	1	5	0	7	2	16	2	6	26
Total:	11		13		5		9		18		32	
% Total	13%		15%		6%		10%		20%		36%	

Weekend Midday Peak												
Date	7/19/2025											
Day	Saturday											
Time (Start/End)	9:45 - 10:45 AM											
Observer	Adrian											
Temperature	75 F											
Weather Conditions	Sunny											
Time	#1 Arlington St (North Leg)		#2 Nichols Ave		#3 Arlington St (South Leg)		#4 Coolidge Hill Rd		#5 Crawford St		#6 Diagonal Crossing	
	Walk	Bike / Roll	Walk	Bike / Roll	Walk	Bike / Roll	Walk	Bike / Roll	Walk	Bike / Roll	Walk	Bike / Roll
9:45	2	1	4	1	1	0	3	0	3	0	5	16
10:00	4	4	1	0	0	0	0	0	3	0	6	9
10:15	1	0	0	0	2	0	4	1	4	0	5	10
10:30	5	1	0	0	0	1	1	1	5	1	0	10
Total:	12	6	5	1	3	1	8	2	15	1	16	45
Total:	18		6		4		10		16		61	
% Total	16%		5%		3%		9%		14%		53%	

Counts were conducted on:

- 5/14/2025 Wed PM
- 5/29/2025 Thurs Midday
- 6/17/2025 Tues AM
- 7/19/2025 Sat Midday

Participants counted in 15 minute increments, focused on how many people are using any given crossing, and noted which mode (either walk or bike/roll). This was not a screen-line count of greenway users, rather it focused on how people are navigating the intersection.