

# Pilot A Statewide Pedestrian and Bicycle Count Program in Wisconsin

Wisconsin Governor's Bicycle  
Coordinating Council Meeting  
September 17<sup>th</sup>, 2025

Project Overview and Preliminary Findings

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# Agenda

- Project Background
  - Introduction
  - Objectives
- Tasks
  - Technical Advisory Committee: 1) devices selection, 2) sites selection, 3) data format & elements recommendation
  - Field data collection: 1) local community engagement & coordination, 2) counter deployment, 3) troubleshooting
  - \* Web-application & Data Dashboard
- Summary & Recommendation
- New Proposal

Pedestrian **Exposure Data** for  
the WI Highway System:  
WisDOT Southeast Region  
(**2021**) & Statewide (**2022**)

**Traditional Count  
Data**

(e.g., fixed location  
counters, manual counts)

**Uniform  
Database**

Statewide Ped & Bike Count  
**Database** for Risk Exposure  
Assessment (**2023**)

**Crowdsourced  
Data**

(e.g., Strava,  
StreetLight, Replica)

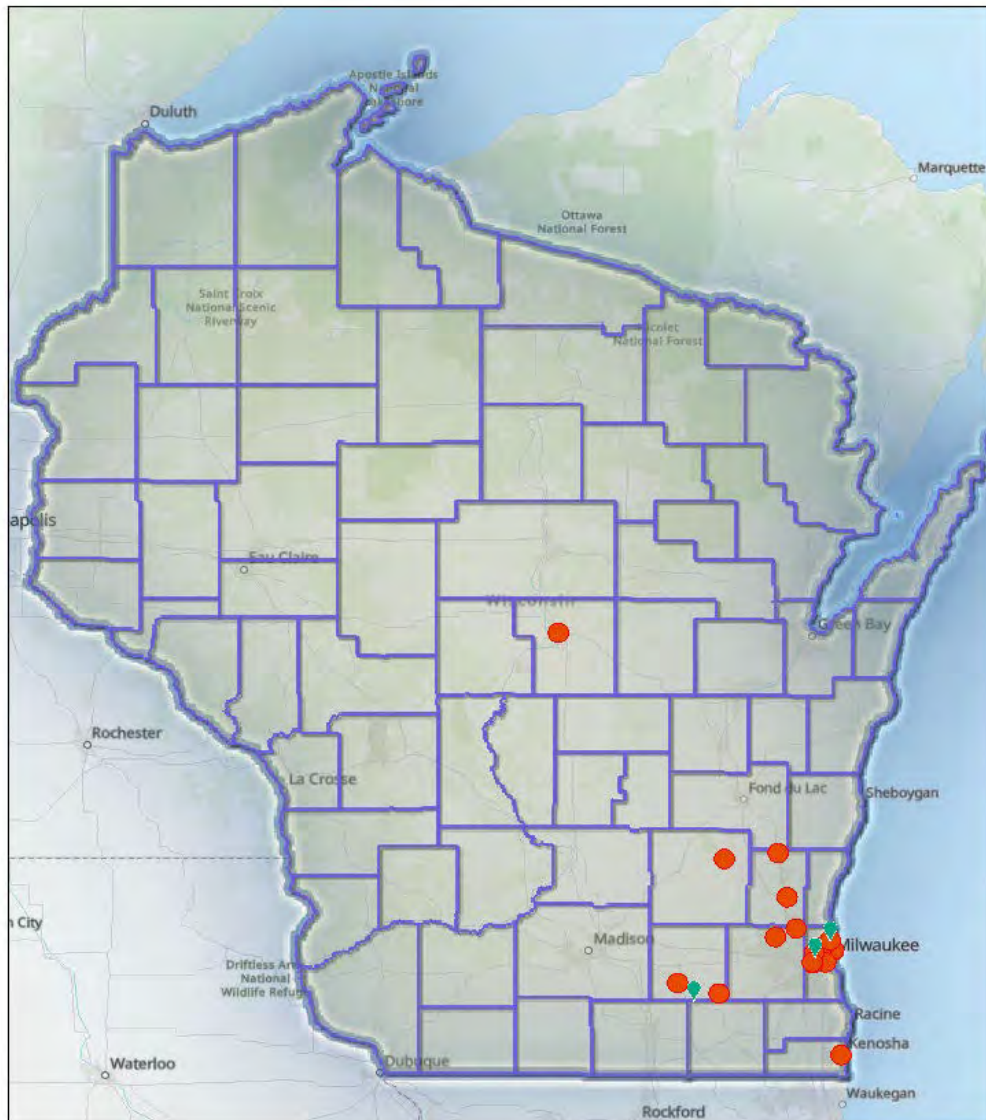
Estimating Statewide Ped &  
Bike Volumes Using  
**Crowdsourced Data** Phase I  
(**2023**) & II (**2024**)

Pilot WI Statewide Ped  
& Bike **Count Program**  
(**2024**)



# Objectives

1. Establish a technical advisory committee (TAC)
2. Acquire ped/bike counting devices
3. Perform counting studies
4. Validate and calibrate count models
5. Disseminate results
6. Make recommendations

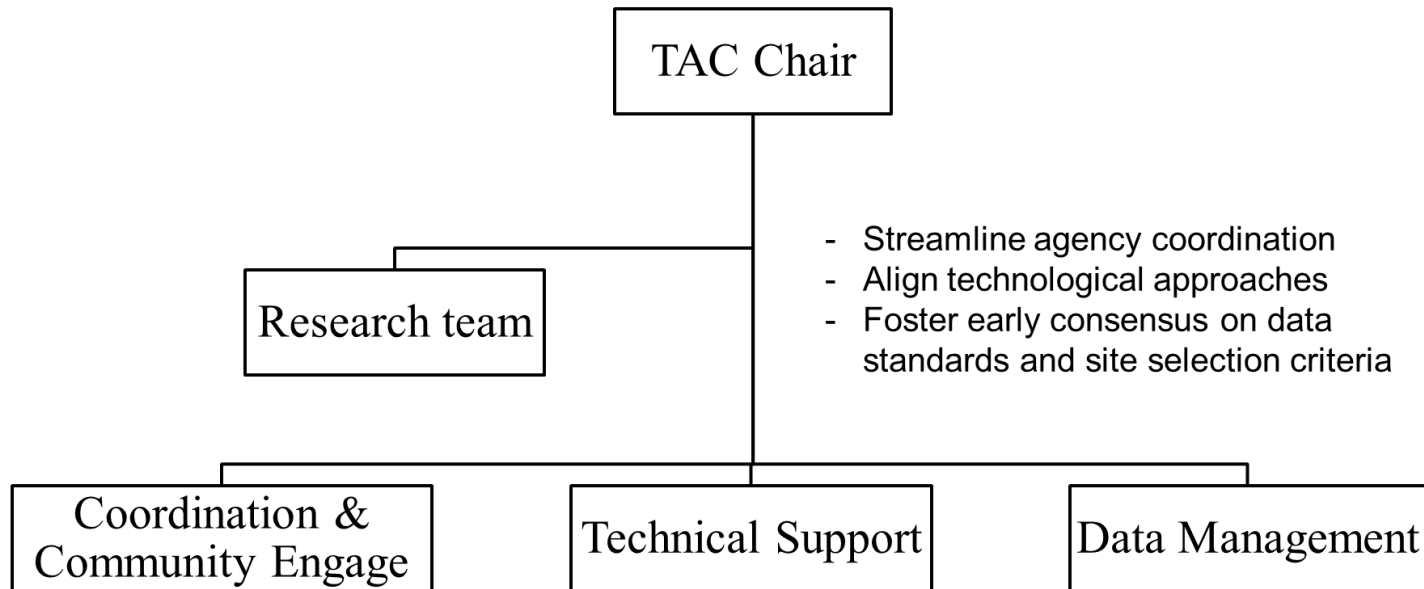


9/8/2025

1:3,536,443  
0 20 40 80 mi  
0 30 60 120 km

- Long Term Counts (Camera)
- Short Term Counts (Eco counter)

# TAC Organizational Chart



## 1. Coordination & Community Engagement

- Build partnerships with local communities and agencies
- Leverage resources and maintain communication
- Collect and integrate stakeholder feedback

## 2. Technical Support

- Recommend and evaluate count devices
- Develop protocols for data collection & QA/QC
- Guide site selection, timing, and handling anomalies

## 3. Data Management

- Standardize data collection procedures
- Ensure secure and compliant data storage
- Process large datasets for usable insights (QA/QC)
- Plan for scalability and future initiatives

# Counting Device Selection

- Long-Term:

- Axis Q1656-DLE Radar-Video Fusion Cameras
- Viva V2 Sensor



- Viva V2 Sensor

- Short-Term:

- Eco-Counter Mobile MULTI



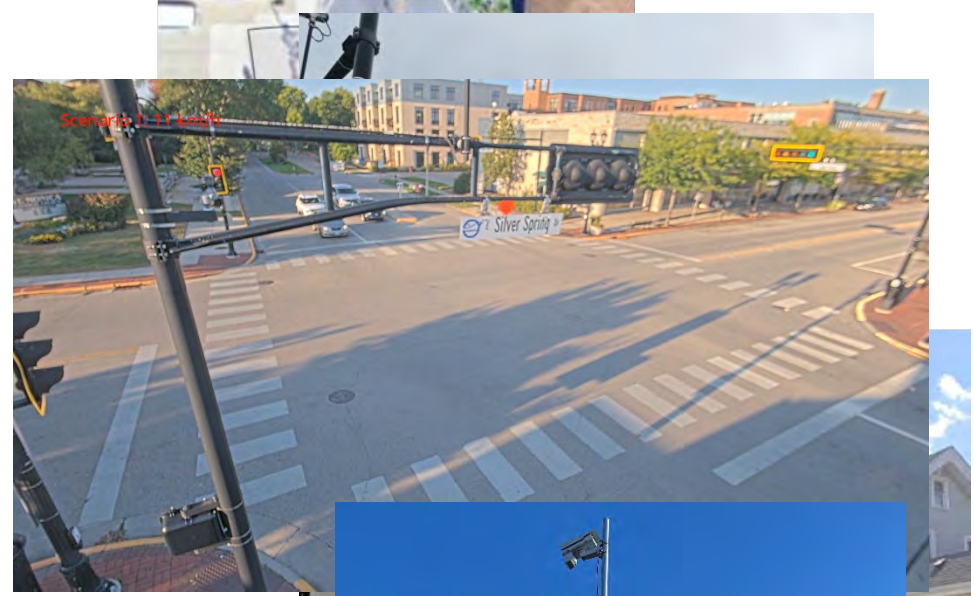


# Site Selection

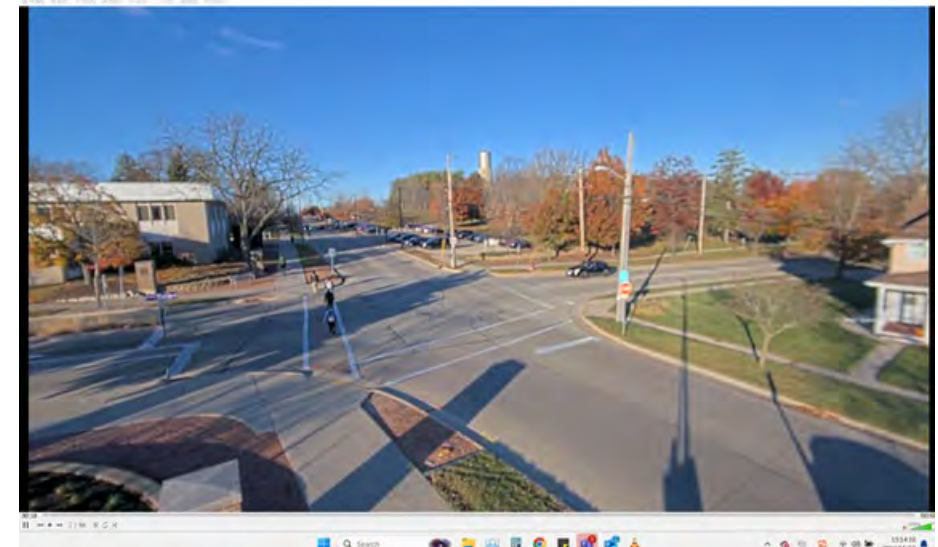
## Long Term Counts

- Urban neighborhood commercial streets
  - N 68<sup>th</sup> St & W Well St
  - City of Wauwatosa
- Downtown zone
  - N Santa Monica Blvd & E Silver Spring Dr
  - Village of Whish Bay
- Rural/Institutional area
  - W Starin Rd & N Prairie St
  - University of Wisconsin - Whitewater

N. 68th St. & W. Well St.



Intersection crossing volume



# Site Selection

## Short Term Count

- # of counts: 16
- Determined by TAC
- Covered representative categories according to land uses

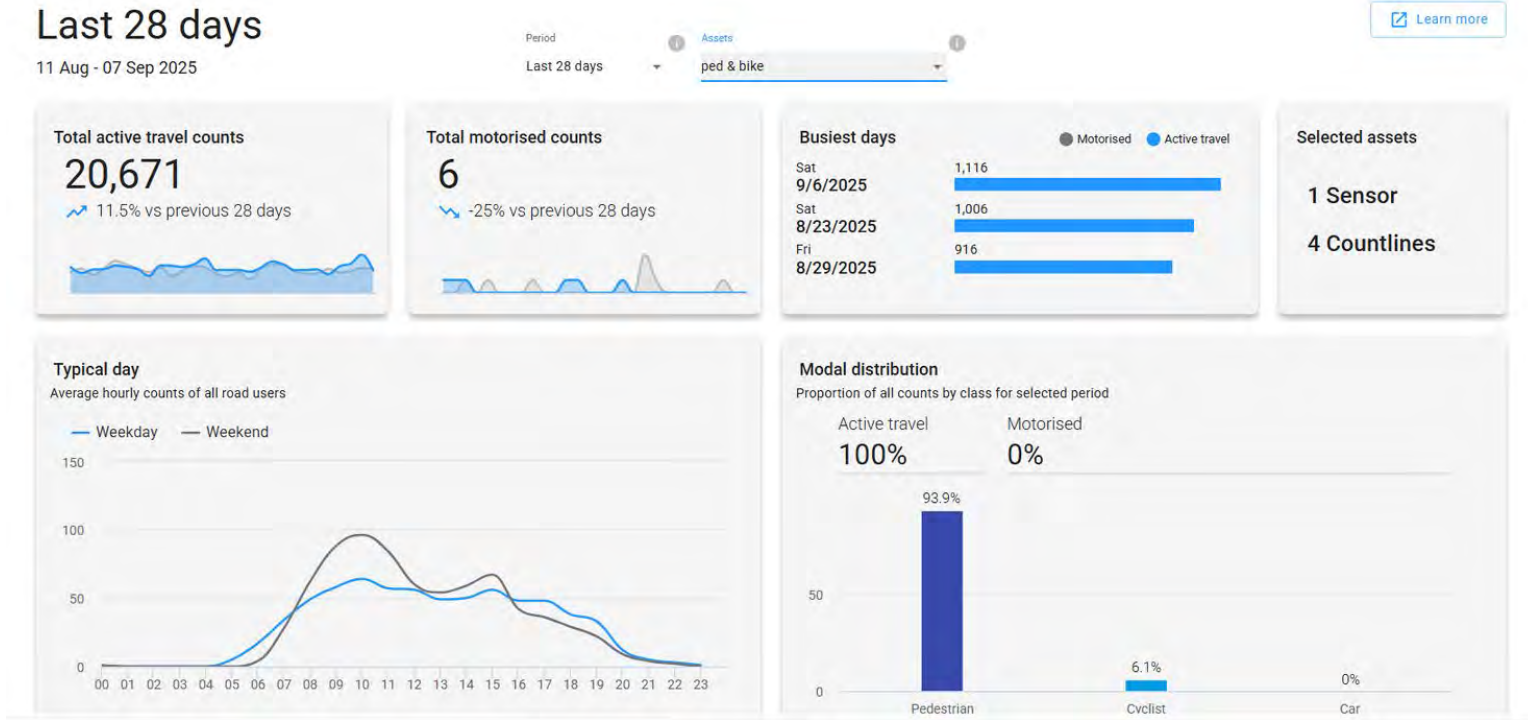
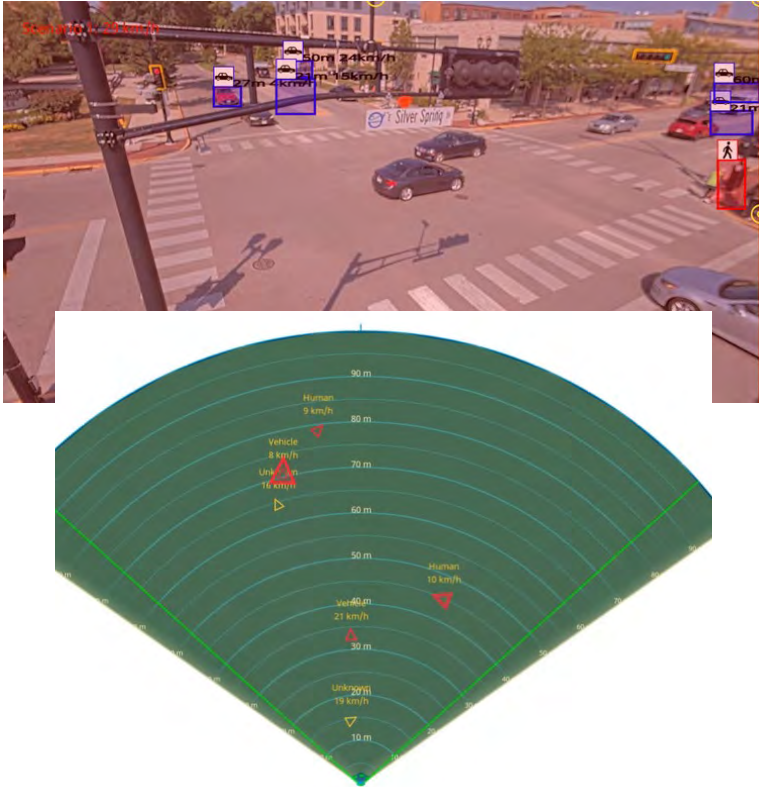
Category	Locations	
Safety	Capitol Dr. & 35th St. - Mixed (Other specialized commercial; Residential)	
	S Cesar E Chavez Dr. & W National Ave. - Grocery/routine shopping	
	STH 158 between 22nd Ave. and Wood Rd.	
Before/after volumes	STH 164 near Silver Spring Dr. - Grocery/routine shopping	
	Wildlife Dr. & Reigle Dr. - Institutional: K-12	
Tourism/event	S 84th St. & Gate 4 - Residential	
Baseline - School (K-12)	N North Ave. & STH 181	
Baseline - Institutional: College	Sidewalk & bike lane volume	
Baseline - Residential [Urban/Suburban]		STH 26 & S 3rd St. W (Fort Atkinson)
		W Orchard St. & S 79th St. (West Allis)
Baseline - Residential [Rural]		Dayton St & N Henninger St (Mayville)
		South St. & Western Ave. (Jackson)
Baseline - Social recreation		WI-59 & N 2nd St.
		STH 175 & Main St.



# Data Features Selection

Count ID	WISDOT TC4	WISDOT TC9
Site Name	E Day Ave. & N Santa Monica Blvd.	STH 26 & S 3rd St. W
City	Whitefish Bay	Fort Atkinson/Watertown
County	Milwaukee	Jefferson
Latitude	43.122389	42.925881
Longitude	-87.90675	-88.841515
Total User Count	4300	1900
Report URL	<a href="#">N Santa Monica Blvd &amp; E Day Ave, Whitefish Bay, WI</a>	<a href="#">STH 26 &amp; S 3rd St. Fort Atkinson</a>
Type of Count Represented	Ped & Bike	Bike Only
Roadway Classification	Minor arterial	Principal arterial / State highway
Direction of Movement / Route	NB/SB	NB/SB
Facility Type	Shared path & Side Walk	Trail

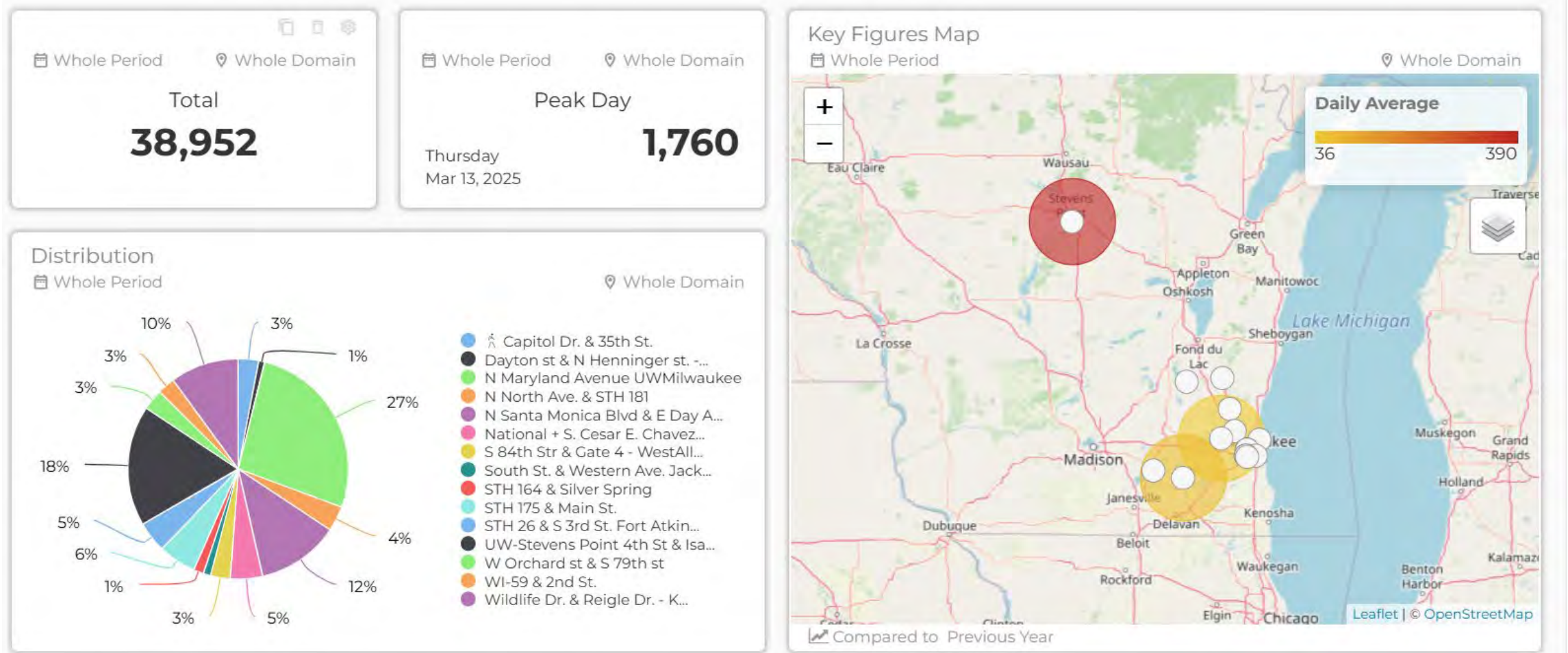
Method of Counting	Multi Mobile Eco Counter	Multi Mobile Eco Counter
Users / Hour	12	4
Duration / Interval / Total Hours Counted	360	480
Average Temperature	41	70
Facility Impacts	None	None
Estimated Annual User Volume		
Notes / Metadata Link		
Organization Performing Count	UWM/WISDOT	UWM/WISDOT
Actual Installation Date	3/27/2025	6/28/2025
Actual Retrieval Date	4/11/2025	7/18/2025



Viva: Real-time dashboard and auto-reporting

## Long-Term Data Collection (Axis & Viva)

- Axis: Video + radar, SD card storage, remote access
- Viva: Real-time dashboard and auto-reporting
- SD card failures and network issues noted



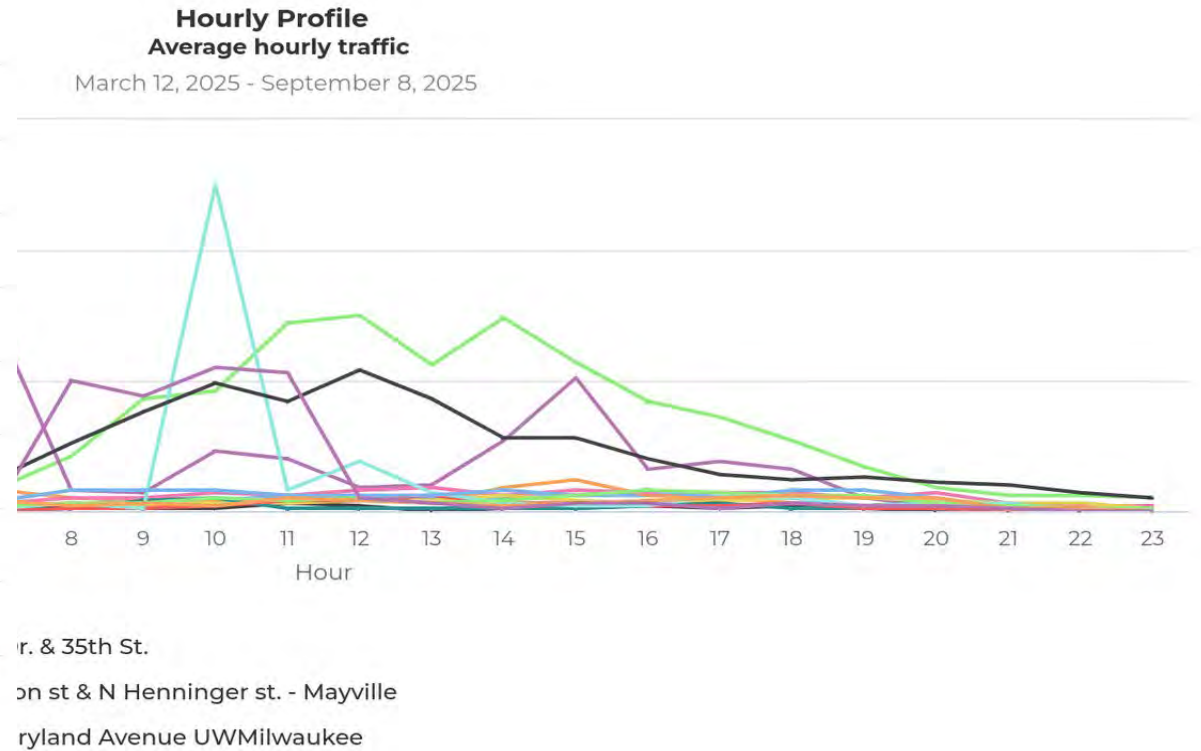
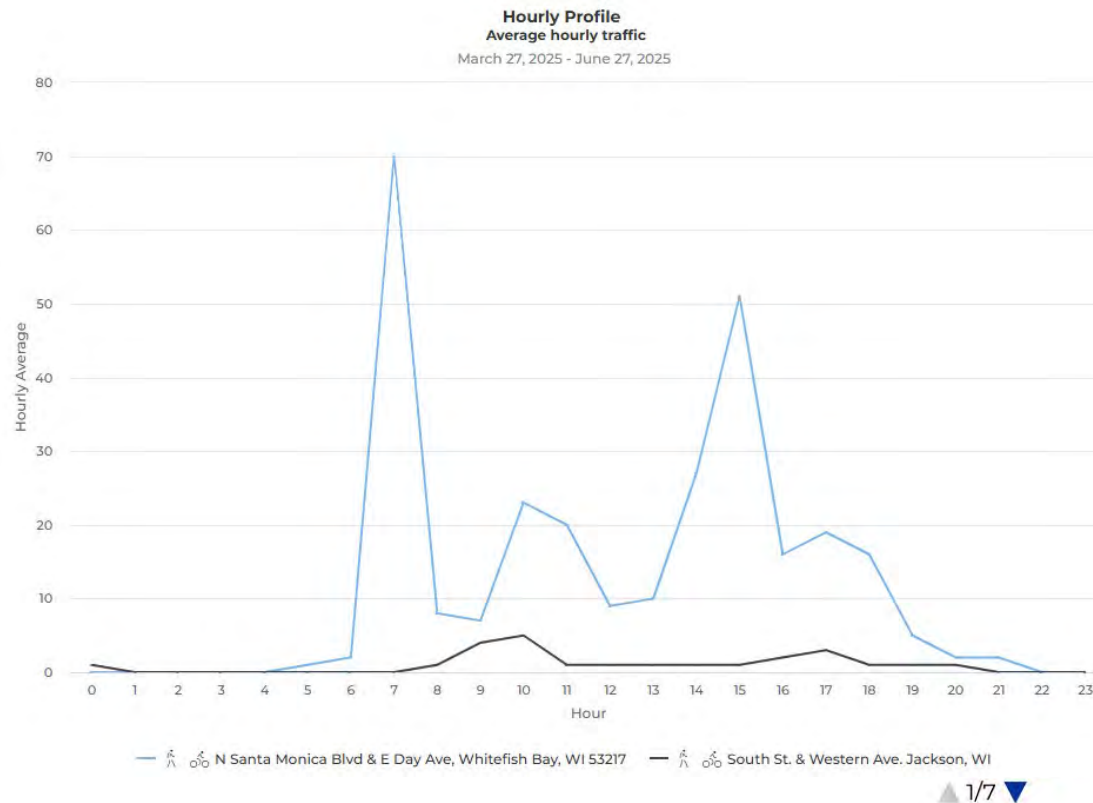
## Short-Term Data Collection (Eco-Counter)

- 16 locations with 14+ day deployments
- Dashboard used for daily monitoring and downloads



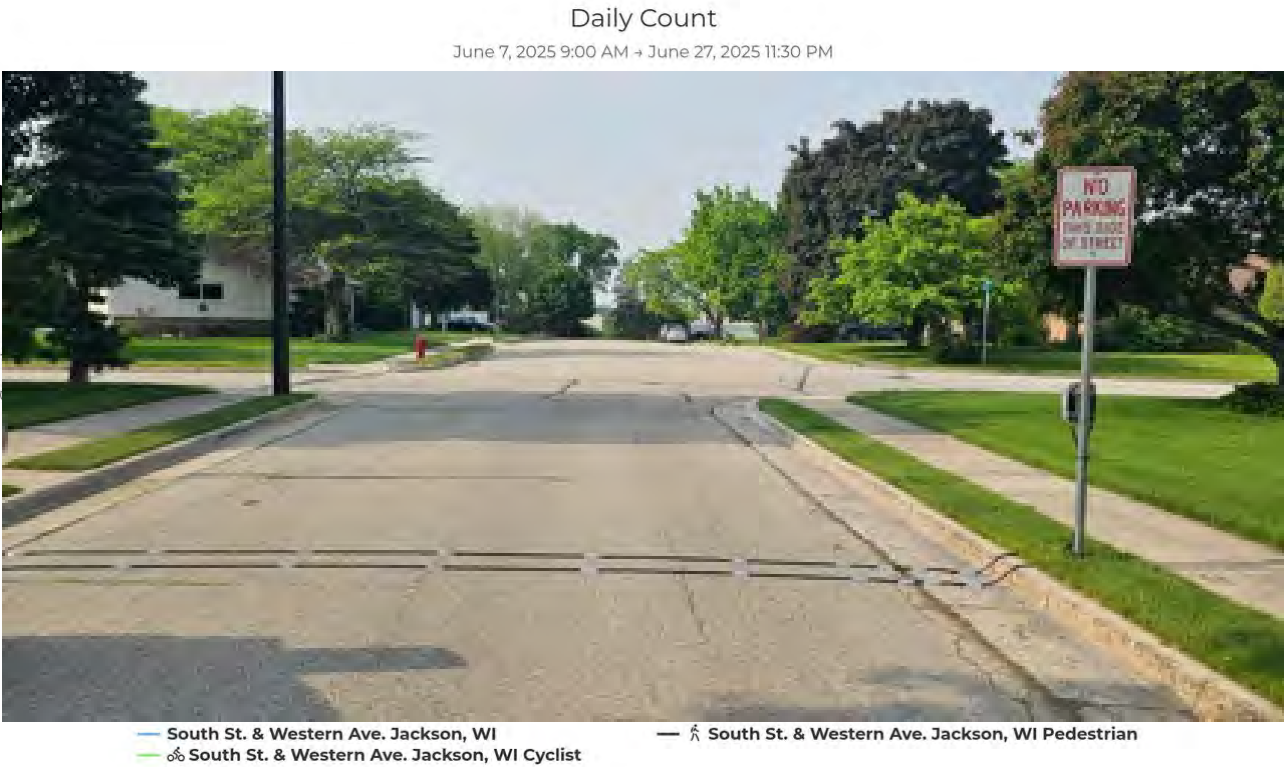
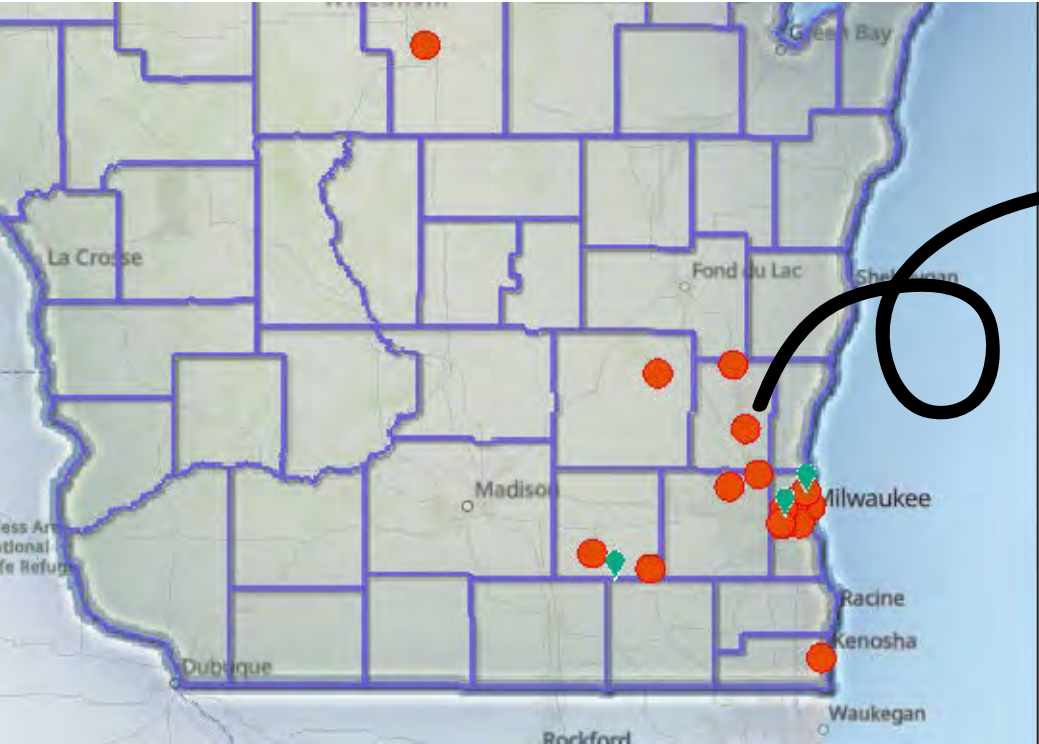
# Preliminary Analysis (2024–2025)

- Over 2.5 TB of data from the UW-Whitewater site
- Viva sensor consistent daily counts
- Eco-Counter peak hours match school & weekend activity

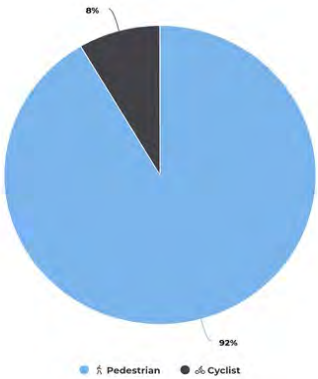




# Short-Term: South St. & Western Ave. Jackson, WI



Analysis by Direction  
June 7, 2025 9:00 AM + June 27, 2025 11:30 PM



## Total Count

Whole P... South St. & Western Av...

Total

**507**

ROCTURE  
ON

## Peak day

Whole P... South St. & Western Av...

Peak Day

**81**

Sunday  
Jun 22, 2025

## Daily Average

Whole P... South St. & Western Av...

Daily Average

**24**

## Peak Month Count

Whole P... South St. & Western Av...

Total

**507**



# Community Engagement

- 16 municipalities coordinated for temporary counts
- 3 permanent installations supported by local agencies
- 1 TAC includes local & state experts across disciplines



# Communities Coordination and

## ROW Permit - 49-24 Approval

Re: Pilot Wisconsin Pedestrian and Bicycle Count Program

Re: Request for Approval – Temporary Installation of Pedestrian & Bicycle Counters in Mayville

**From:** Brad  
**Sent:** Monday, April 7, 2025 1:05 PM  
**To:** Mohammad  
**Co:** Yang Li  
**Subject:** RE: Request for Approval – Temporary Installation of Pedestrian & Bicycle Counters in Mayville

Hello,  
Mohammad I've spoken

RE: [External]Request for

**From:** Dennis Aupperle <dennis.aupperle@milwaukee.gov>  
**To:** Olanrewaju Emmanuel Ogunniyi <ogunniyi2@uwm.edu>  
**Subject:** RE: [External]Request for Approval – Temporary Installation of Pedestrian & Bicycle Counters in Mayville

You replied to this message on 4/8/25

Re: Pilot Wisconsin Pedestrian and Bicycle Count Program

**From:** Amsden, Mike <mamsde@milwaukee.gov>  
**To:** Olanrewaju Emmanuel Ogunniyi <ogunniyi2@uwm.edu>  
**Cc:** Yan, Amber - DOT <amber.yan@dot.wi.gov>; Mohammad Wael Amer <mwamer@uwm.edu>; Yang Li <yangli22@uwm.edu>  
**Subject:** RE: Pilot Wisconsin Pedestrian and Bicycle Count Program

You replied to this message on 3/3/2025 12:09 PM.

Thanks, Emmanuel. I've passed this on to our permits folks to ensure fees are waived. If you have any issues or hold-ups please let me know.

-Mike

**From:** Olanrewaju Emmanuel Ogunniyi <ogunniyi2@uwm.edu>  
**Sent:** Monday, March 3, 2025 9:54 AM  
**To:** Amsden, Mike <mamsde@milwaukee.gov>  
**Cc:** Yan, Amber - DOT <amber.yan@dot.wi.gov>; Mohammad Wael Amer <mwamer@uwm.edu>; Yang Li <yangli22@uwm.edu>  
**Subject:** RE: Pilot Wisconsin Pedestrian and Bicycle Count Program

Hi Mike,

Thank you once again for your support

I have filled out and submitted the ROW Occupancy Permit requests for the installations. Below are the record numbers for reference:

- PWOP-25-00132
- PWOP-25-00127
- PWOP-25-00134
- PWOP-25-00126
- PWOP-25-00133
- PWOP-25-00131
- PWOP-25-00128
- PWOP-25-00130
- PWOP-25-00135
- PWOP-25-00129

Please let me know if any further information is needed. Thanks again for waiving the fees, as you did previously.

Best,

Emmanuel

**From:** Amsden, Mike <mamsde@milwaukee.gov>  
**Sent:** Wednesday, February 26, 2025 3:53 PM  
**To:** Olanrewaju Emmanuel Ogunniyi <ogunniyi2@uwm.edu>  
**Cc:** Yan, Amber - DOT <amber.yan@dot.wi.gov>; Mohammad Wael Amer <mwamer@uwm.edu>; Yang Li <yangli22@uwm.edu>  
**Subject:** Re: Pilot Wisconsin Pedestrian and Bicycle Count Program

Hi Ogunniyi-

I've been told you will need to submit ROW Occupancy Permit requests for this installations. We'll waive the fees as we did previously.





# Challenges & Solutions



## Weather Disruption Counter and Camera Maintenance

**Impact:** Accumulated snow and fog reduced visibility and sensor accuracy, affecting data quality.

**Solution:** Implemented routine site checks and cleared snow manually to maintain sensor functionality.

## SD card issue and Data Loss

**Impact:** Data loss from corrupted or auto-formatted SD cards resulted in irrecoverable gaps.

**Solution:** Upgraded firmware, tested compatible SD cards, and considered third-party recovery tools and remote data backups.

## Cabinet Access restriction

**Impact:** Denied access to traffic cabinets caused delays in powering equipment at key intersections.

**Solution:** Proposed the use of portable power supplies and early engagement with municipal DPW to build trust and understanding.

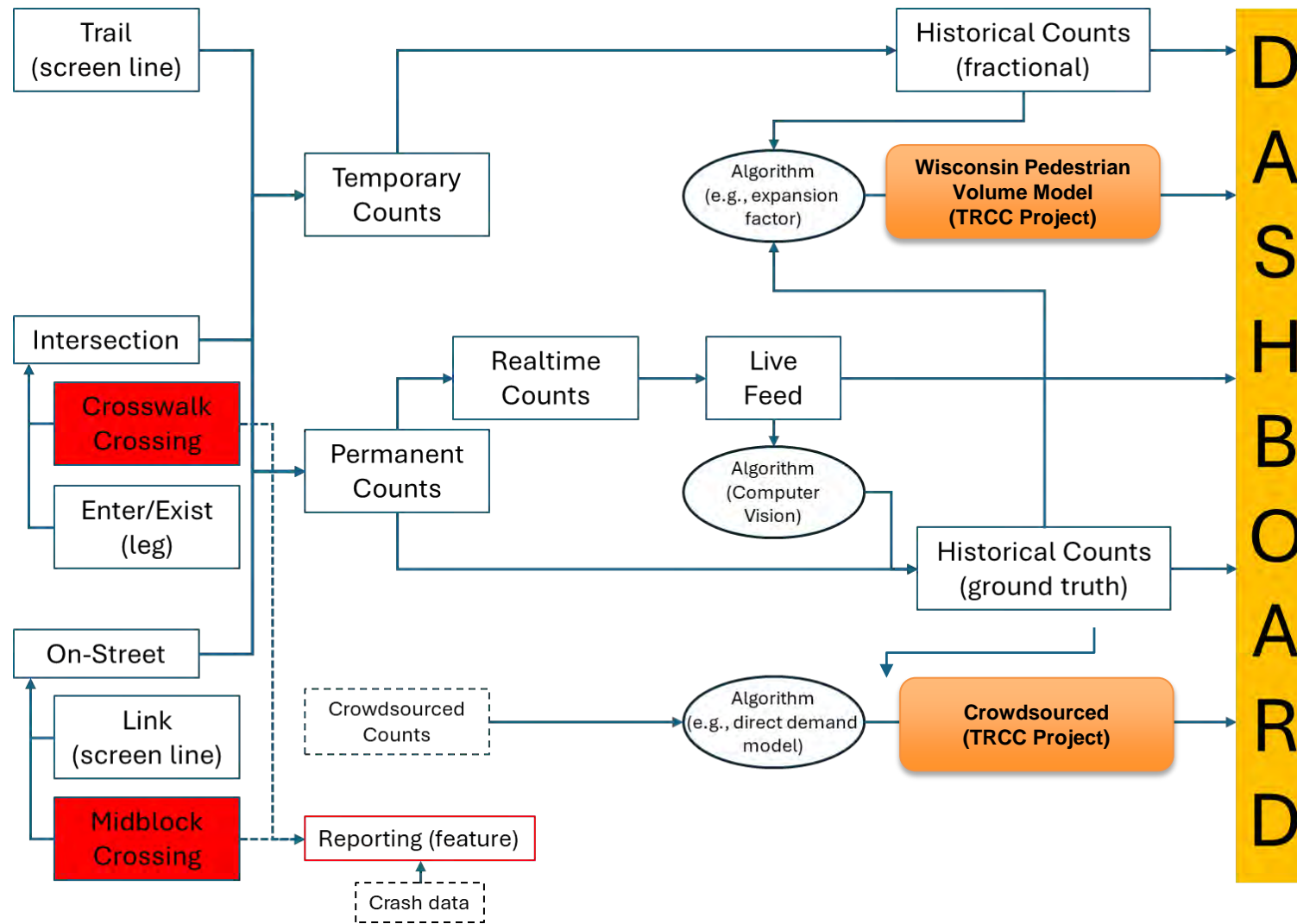
## Municipal Approval Delays

**Impact:** Extended approval timelines disrupted deployment schedules and resource planning

**Solution:** Strengthened TAC engagement, provided detailed project documentation upfront, and recommended involving local DPW staff in future planning.



# Dashboard in Action



## FUTURE INTEGRATIONS

- Products of **Image processing** TRCC project (e.g., detection algorithms, infrastructure data)
- CIEACT (Crash Information Extraction, Analysis and Classification) tool (TRCC project)
- Products of other non-TRCC projects (e.g., [real-time] video analytic tool, domain specific [traffic safety analysis] LLM)
- Others...

<https://uwm.edu/ipit/wi-pedbike-dashboard/>

# Dashboard in Action

**MILWAUKEE** Institute for Physical Infrastructure and Transportation

AccSafety – IPIT Safety Dashboard

The Pilot Pedestrian and Bicycle Count Program is a regional initiative led by the University of Wisconsin-Milwaukee (UWM) in collaboration with the Wisconsin Department of Transportation (WisDOT). While the current pilot focuses on Southeast Wisconsin, it is designed to lay the foundation for a future statewide non-motorist counting network.

This effort aims to improve the quality, consistency, and availability of pedestrian and bicycle volume data to support data-driven planning, safety interventions, and multimodal infrastructure development. The program integrates both new data collection efforts and historical short-term counts, including trail usage statistics and past pedestrian/bicycle counts collected by municipalities and regional agencies.

The project combines both newly deployed and historical data sources. Recent installations include Long term counters such as the Axle Q1666-OLE radar-sensor fusion cameras and Vira V2 sensors as well as EcoCounter Mobile MULTI units used at rotating short-term sites. These were strategically placed across urban, suburban, and campus environments with input from a diverse Technical Advisory Committee (TAC).

This dashboard visualizes and manages the data collected through these efforts, serving as a powerful tool for transportation professionals, planners, researchers, and community leaders. By enabling better insights into non-motorist travel behavior, the platform supports long-term goals around safety, equity, and sustainable mobility across Wisconsin.

Access Dashboard  
AccSafety Portal

Landing page

Login page

**AccSafety**

Welcome back

Sign in to access Eco, Trail, and Vivacity dashboards.

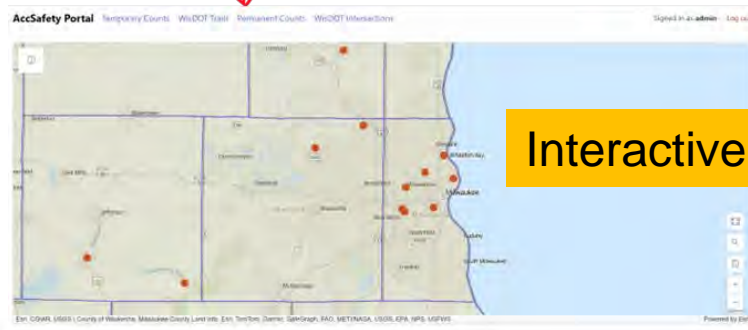
Username  
j.g. admin

Password  
\*\*\*\*\*

☐ Show password

Sign in

Top default creds are admin / admin (change on gateway prv)



Interactive map

Temporary Counts - TRCC Statewide Pilot Counting Projects

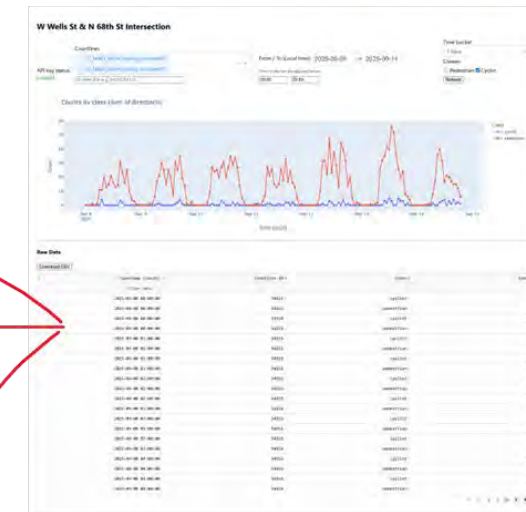
Location	Start Date	End Date	Total Counts	Avg Hourly Count	View
Capitol Dr. & 35th St.	2025-03-14	2025-03-26	868	1	View
Dayton St & W Menninger St. - Payville	2025-06-28	2025-07-18	487	0	View
N Maryland Avenue UWMilwaukee	2025-03-12	2025-03-26	8928	6	View
N North Ave. & STH 181	2025-05-04	2025-06-05	3791	1	View
N Santa Monica Blvd & E Day Ave, Whitefish Bay, WI 53217	2025-07-27	2025-08-11	4386	3	View
National & S. Edgar E. Chavel Drive (S. 18th), Milwaukee, WI 53204	2025-03-28	2025-04-11	1578	9	View
S 64th St & Gate 4 - WestAllis	2025-04-11	2025-06-05	3409	1	View
South St. & Western Ave. Jackson, WI	2025-06-07	2025-06-27	587	0	View
STW 104 & Silver Spring	2025-09-06	2025-09-28	790	1	View
STW 26 & S 3rd St., Fort Atkinson	2025-06-29	2025-07-17	1988	1	View
W Orchard St & S 79th St	2025-04-12	2025-05-02	1437	1	View
WI-59 & 2nd St.	2025-07-22	2025-08-24	1978	1	View
Wildlife Dr. & Heigle Dr. - Newkirk WI	2025-06-07	2025-06-27	8688	5	View

Historical counts

WisDOT Historical Files (xsm)

Intersection Counts

Location	Date	Download
Intersection of: 114 St / North Ave SB On Ramp & W North Ave	2019-09-25	Download
Intersection of: 68th Street and I94 WB Off-Ramp	2019-05-29	Download
Intersection of: 84th St & CTH Y	2019-11-21	Download
Intersection of: 9TH Street & I 43 SB On-Off ramps	2019-11-13	Download
Intersection of: General Mitchell Boulevard and I94 WB Off-Ramp	2019-05-23	Download
Intersection of: Holt Park-n-Ride Lot & W. Holt Ave	2019-10-24	Download
Intersection of: I-894 WB Ramps & STH 181	2018-09-13	Download
Intersection of: I-94 EB Ramps & STH 181	2018-09-13	Download
Intersection of: John Nolen Drive and North Shore Drive	2015-05-06	Download
Intersection of: Kearney Street & I94 EB Off Ramp	2019-05-29	Download
Intersection of: N. Port Washington Rd. & STH 32 (W. Brown Deer Rd.)	2018-10-11	Download
Intersection of: Oconner Street and I94 WB On-Ramp	2019-05-29	Download
Intersection of: STH 24 SB off ramp & CTH Y	2019-11-21	Download
Intersection of: STH 241 & I41 EB	2019-12-02	Download
Intersection of: STH 241 & I41 WB	2019-12-02	Download
Intersection of: STH 32 (S. Chicago Rd.) & E. Puetz Rd.	2018-10-11	Download
Intersection of: STH 32 (S. Chicago Rd.) & E. Oakwood Rd.	2018-10-11	Download
Intersection of: STH24 NB & CTH Y	2019-11-21	Download



Live feed



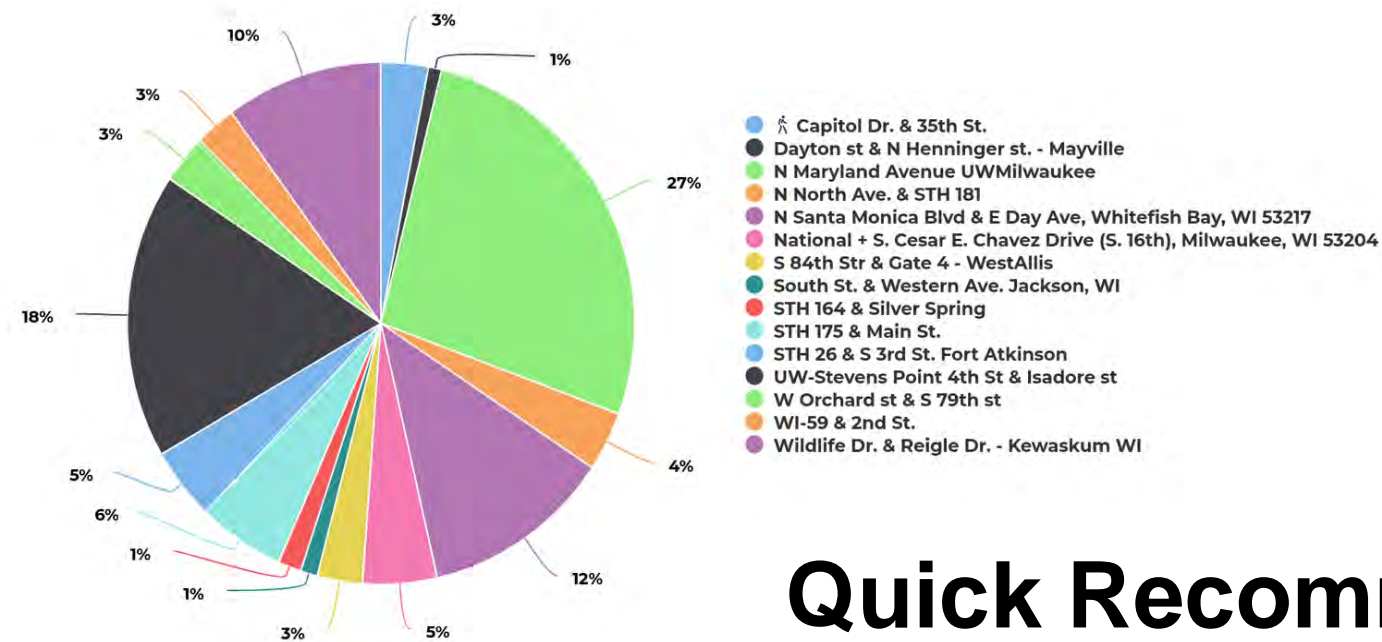


# Summary of Impact

- Increased visibility of non-motorist traffic
- Data now drives safer planning in WI
- Stronger cross-agency coordination
- Lessons for future statewide efforts







## Quick Recommendations

- Designating technical personnel to support installations and liaise with municipal staff.
- Establishing statewide program for on-demand counters rent out to local, ensuring broader access.
- Involving local representatives in the TAC to improve early-stage buy-in and streamline approvals.
- Utilizing solar or battery-powered solutions in urban or restricted environments to avoid tapping traffic cabinets.
- Strengthening data backup protocols, particularly for permanent sites, to prevent data loss and ensure continuity.



# **Wisconsin Integrated Network for Active Mobility Volume & Exposure (WINAMOVE)**

# Overview

- **Objective:** Transition the pilot pedestrian and bicycle counting program the operationalization of a sustainable, statewide non-motorist volume data program integrated with WisDOT systems, local efforts, and SHSP priorities.

- **Scope and Key Objectives:**

- Expand non-motorist counting network
- Develop exposure metrics
- Enhance data management & reporting
- Support long-term safety and planning
- Foster Collaborations and Partnerships

- **Quantitative Improvements:**

- Expanded Permanent Count Coverage
  - Achieve 100% typical land use
  - Focus on on-street facilities and intersections (not just off-street trails)
- Comprehensive Data Collection & Integration
  - Perform ~30 temporarily counts annually
  - Identify/integrate/link historical/existing locations in Wisconsin with count or potential count information
- Robust Exposure Measures
  - Develop comprehensive measures of exposure to risks (e.g., traffic crash, air quality, heat)

# Core Contributions

Area	Contribution
<b>Governance</b>	Maintain a structured, multi-agency TAC as a long-term body to guide the program and potentially advise WisDOT.
<b>Data Infrastructure</b>	Establish a centralized, <b>WisDOT-aligned VRU data clearinghouse</b> for counts — not just at UWM, but potentially institutionalized within a state division. (one-stop catalog)
<b>Sampling Strategy</b>	A <b>rotating count sampling plan</b> to enhance geographic and temporal representativeness — few existing programs are doing this consistently.
<b>Integration &amp; Reporting</b>	Link count data to crash, roadway, SHSP, and FHWA VRU Safety Assessment needs — including <b>mobility and exposure reports</b> at the state level.
<b>Support Tools</b>	Equipment loan program for localities and open data submission portal — filling gaps in <b>local capacity</b> and encouraging grassroots data contributions.

# Thank You

## Any Questions?

Acknowledgment:

This Project Is Sponsored By  
WisDOT BOTS Through  
NHTSA Sec 405c Grant.

Contact:  
Yang Li | [yangli22@uwm.edu](mailto:yangli22@uwm.edu)

