Pilot A Statewide Pedestrian and Bicycle Count Program in Wisconsin

Wisconsin Governor's Bicycle Coordinating Council Meeting
September 17th, 2025

Project Overview and Preliminary Findings

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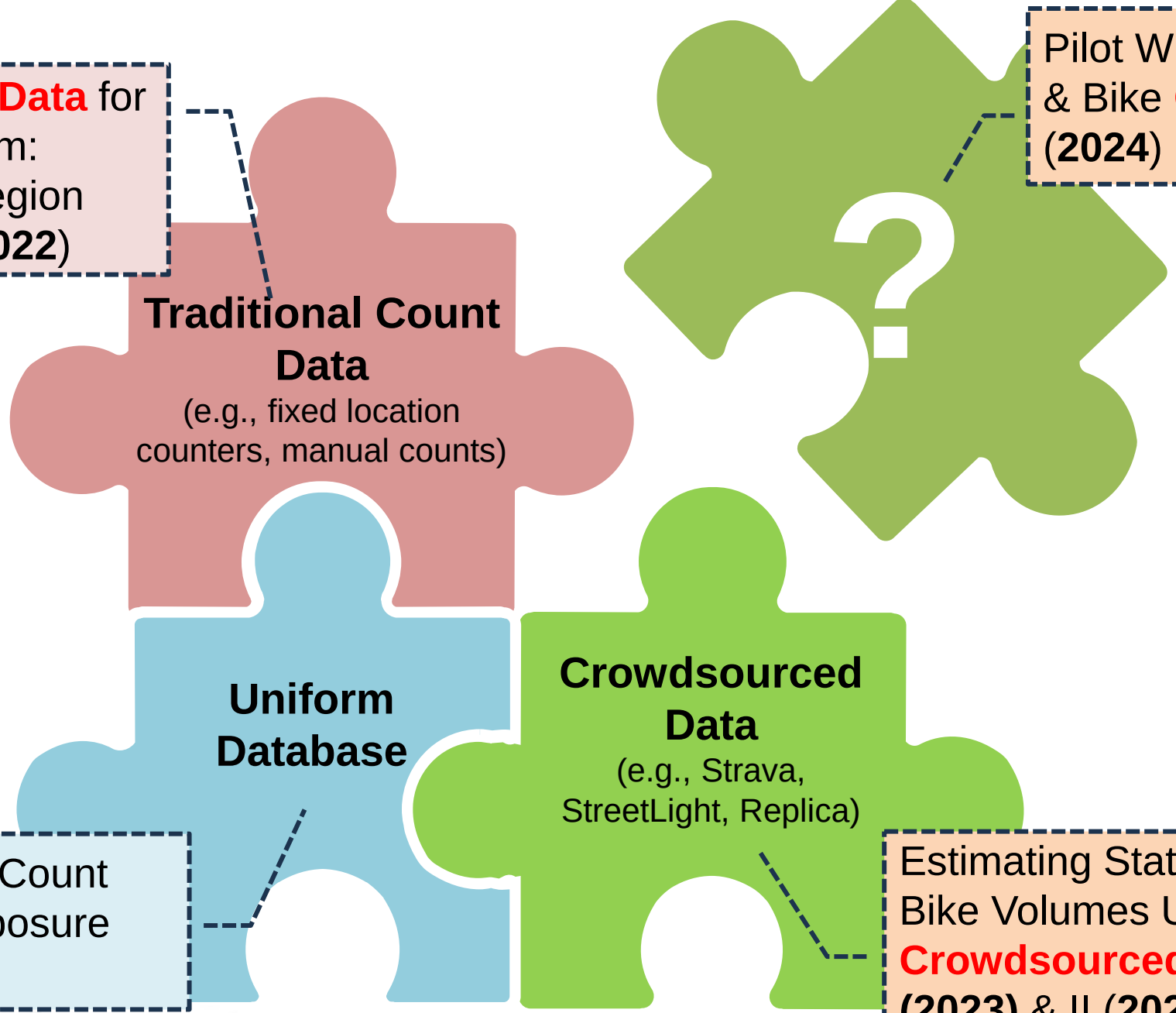
Agenda

- 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**)



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

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

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

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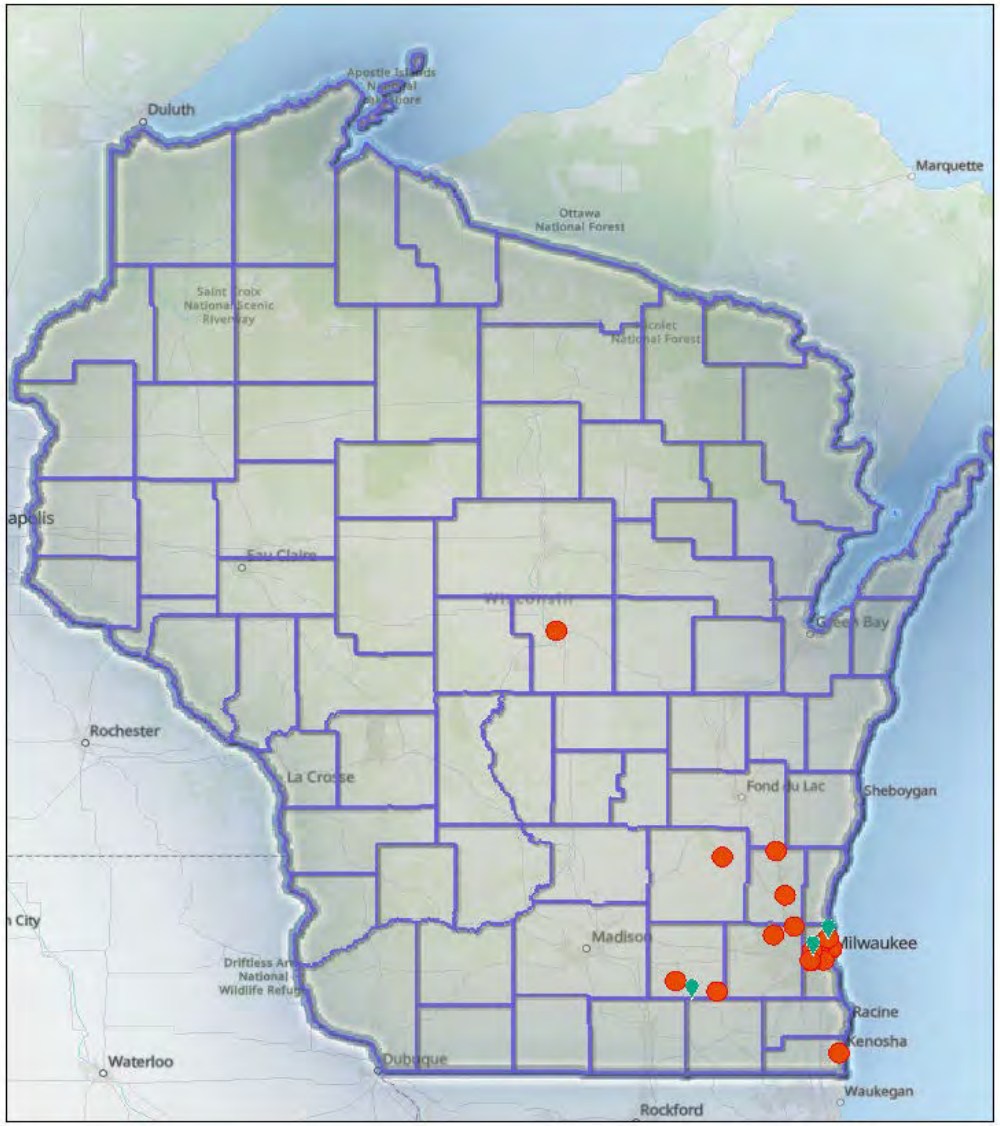

Objectives

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

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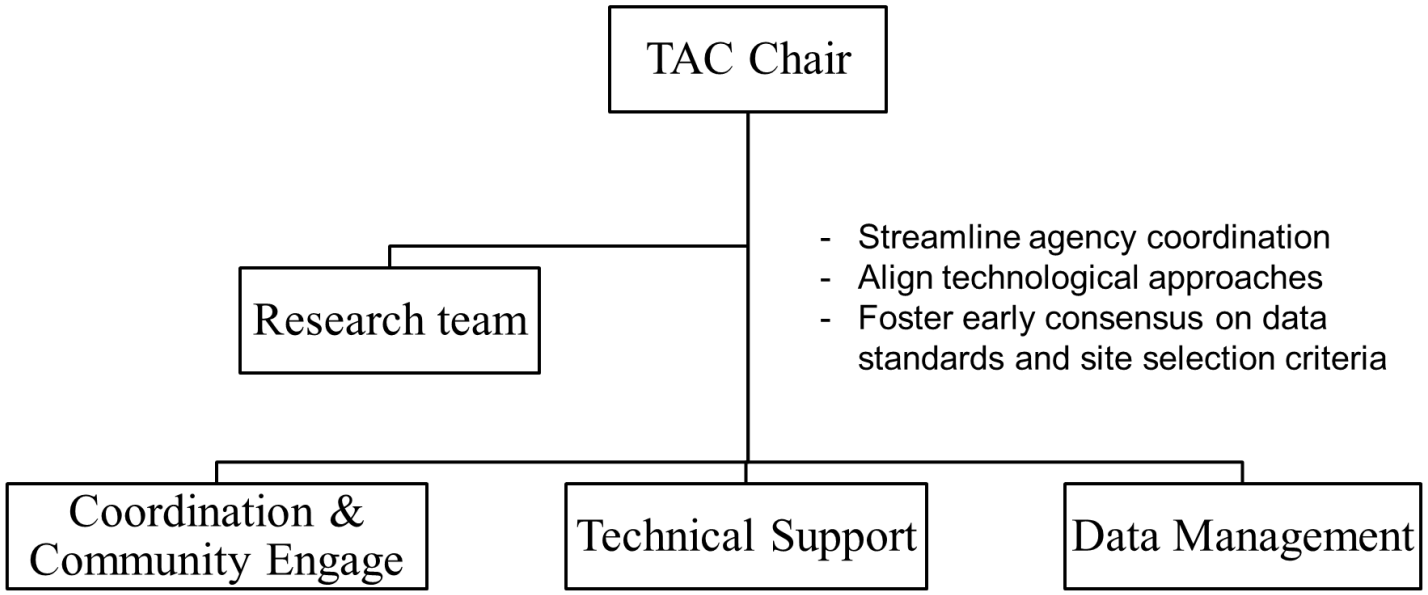
TAC Organizational Chart



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

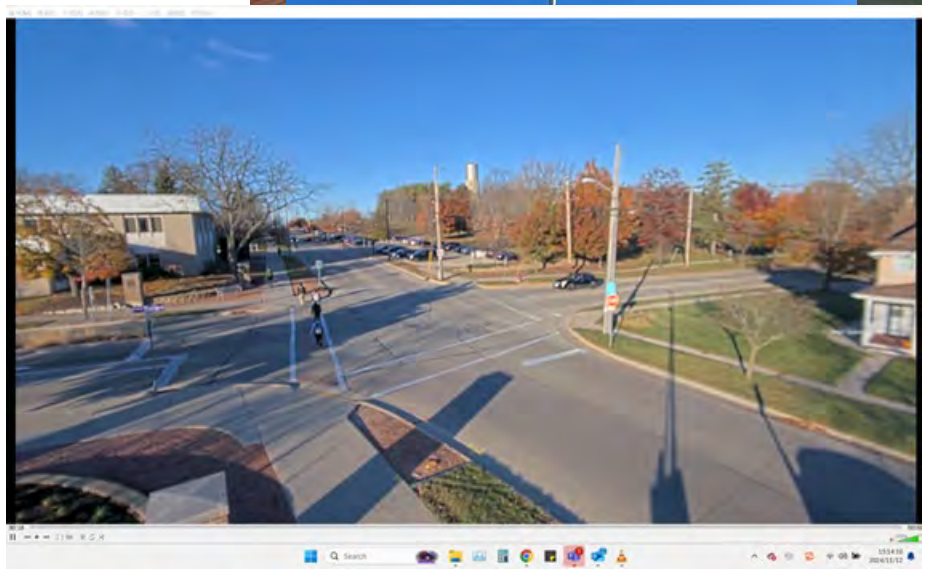
Site Selection

Long Term Counts

- Urban neighborhood commercial streets
  - N 68th 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

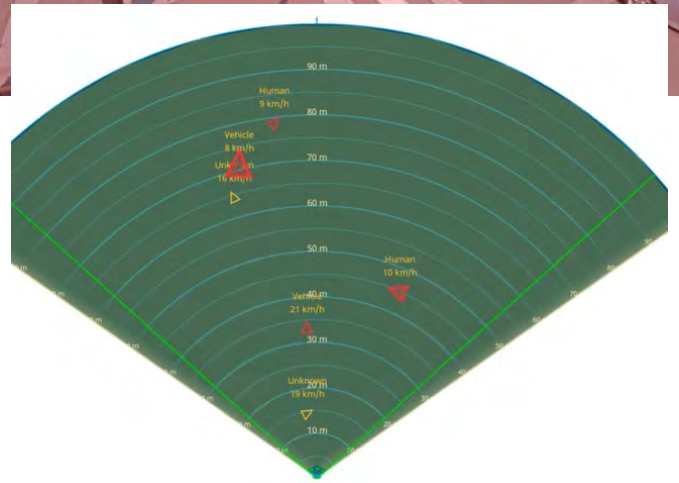
Category	Locations
Safety	Capitol Dr. & 35th St. - Mixed (Other specialized commercial; Residential)
	S Cesar E Chavez Dr. & W National Ave. - Grocery/routine shopping
	STH 158 between 22nd Ave. and Wood Rd.
Before/after volumes	STH 164 near Silver Spring Dr. - Grocery/routine shopping
	Wildlife Dr. & 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	
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.

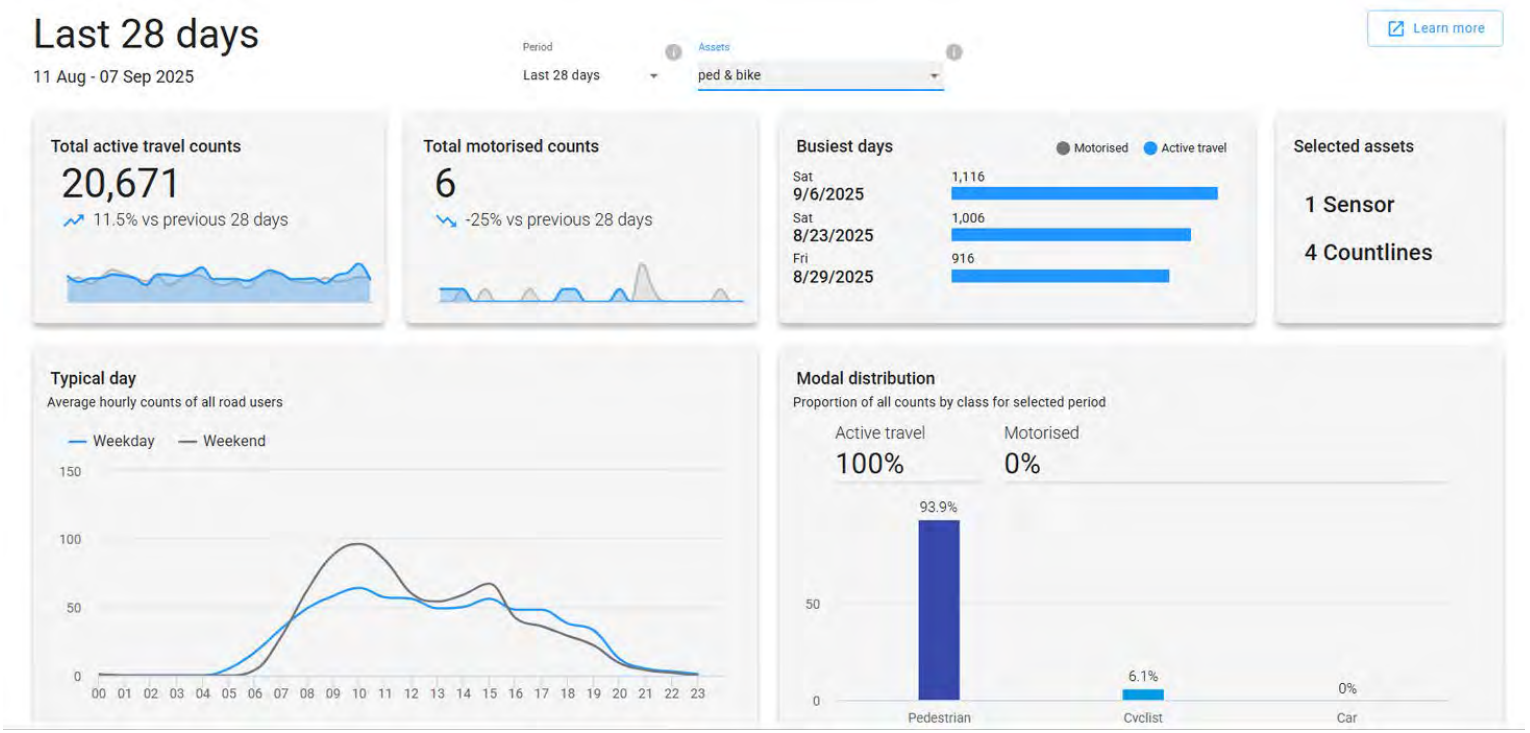
Sidewalk & bike lane volume

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	N Santa Monica Blvd & E Day Ave, Whitefish Bay, WI	STH 26 & S 3rd St. Fort Atkinson
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

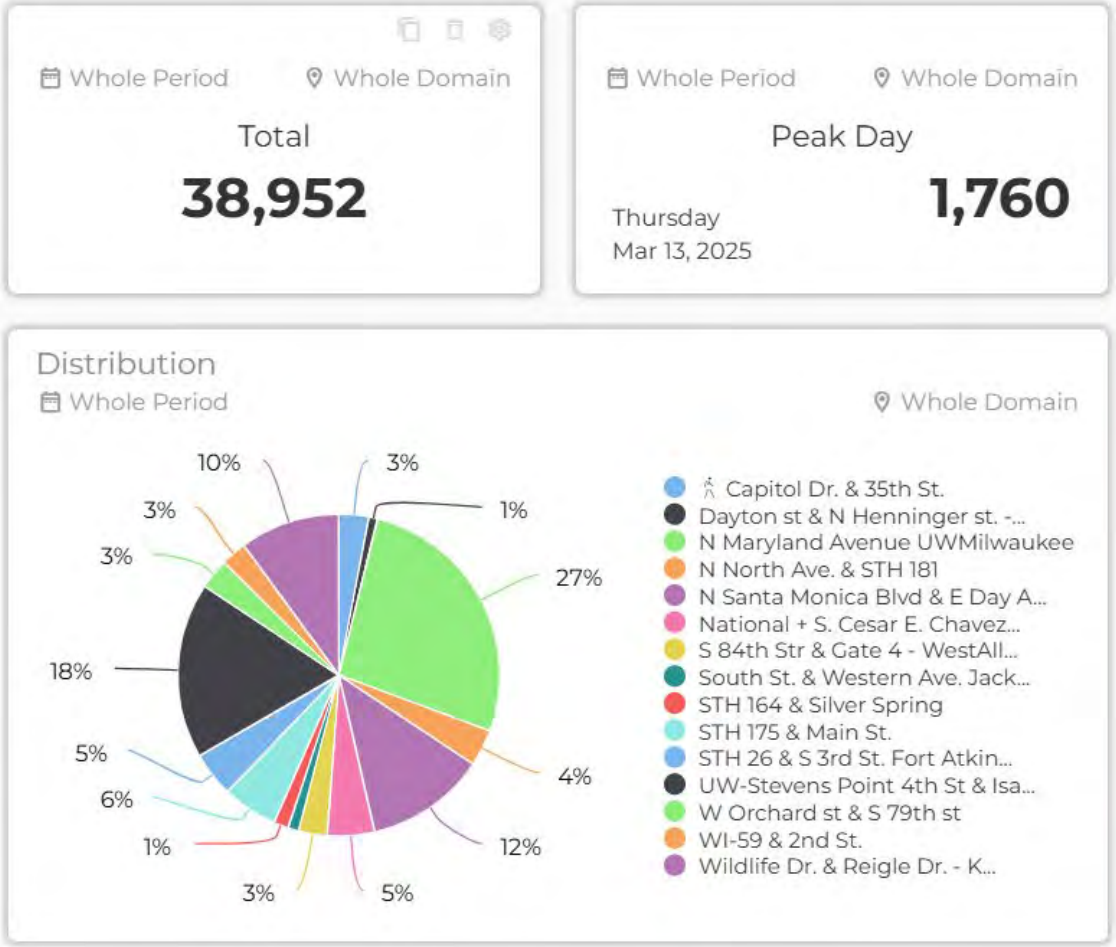


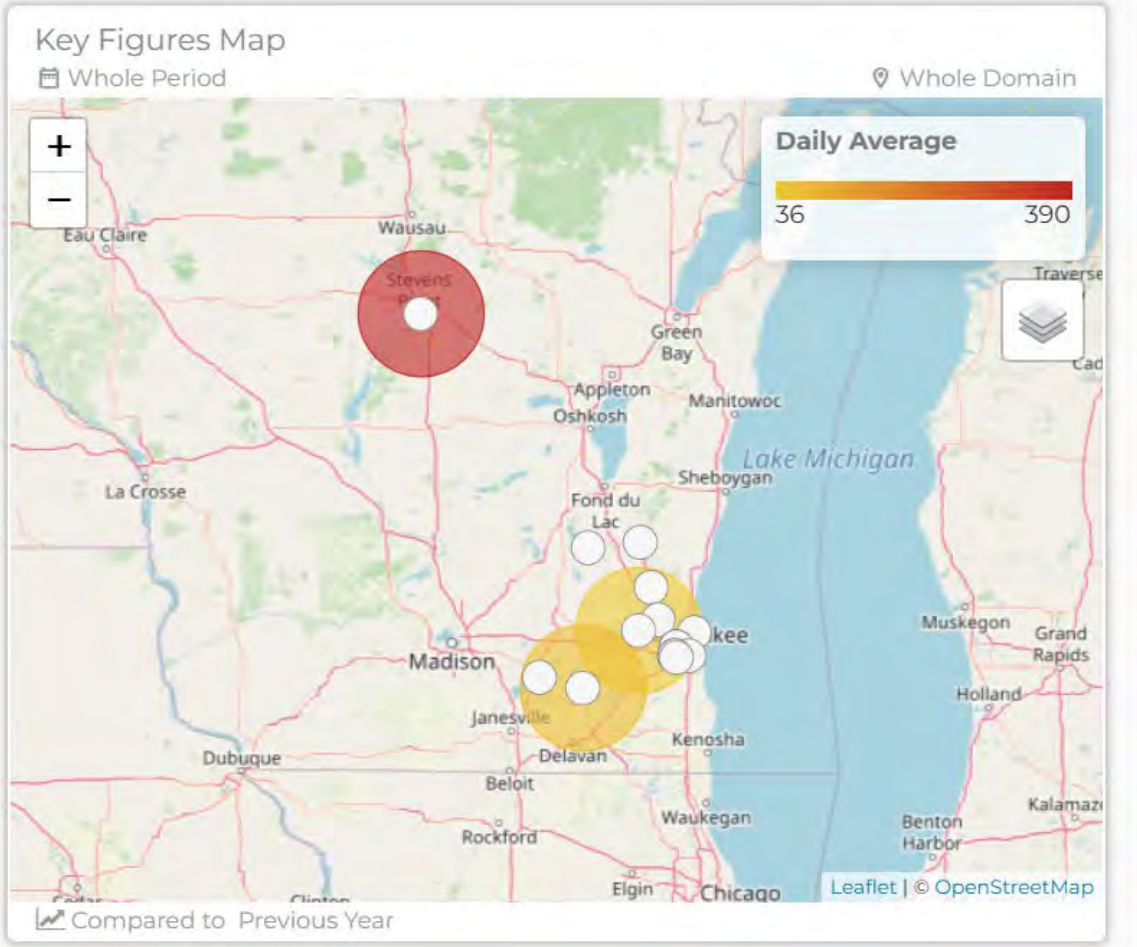


Viva: Real-time dashboard and auto-reporting

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

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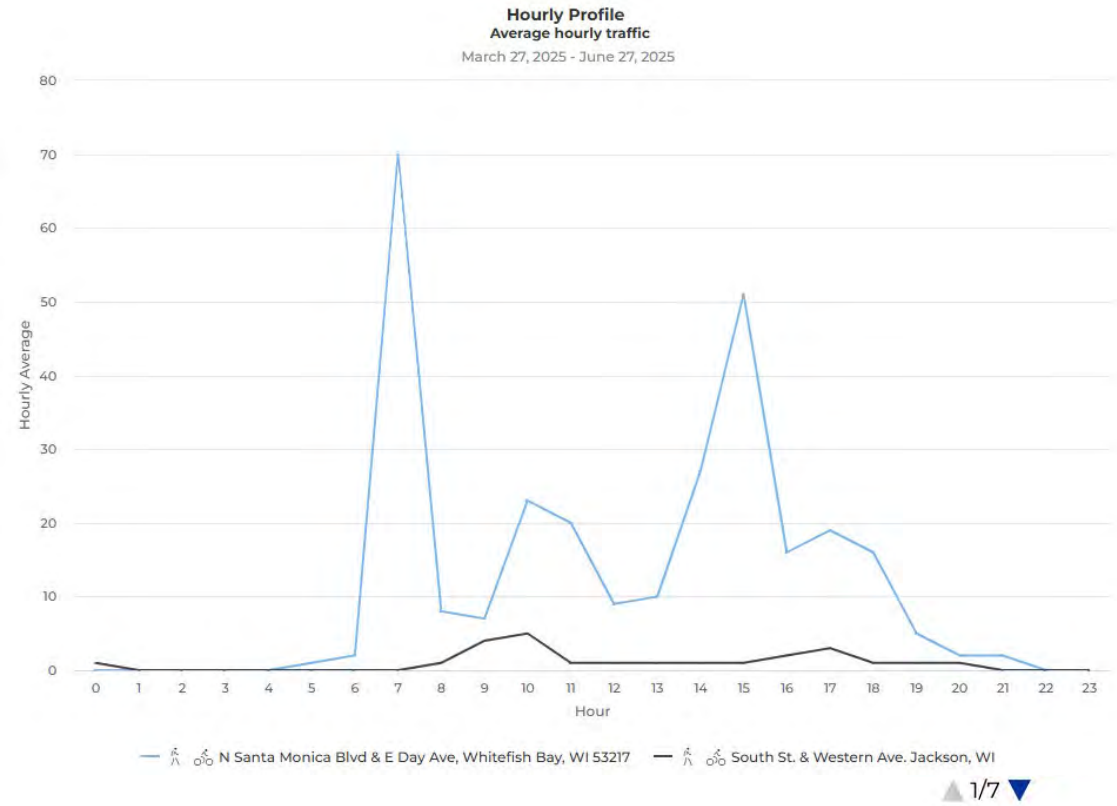
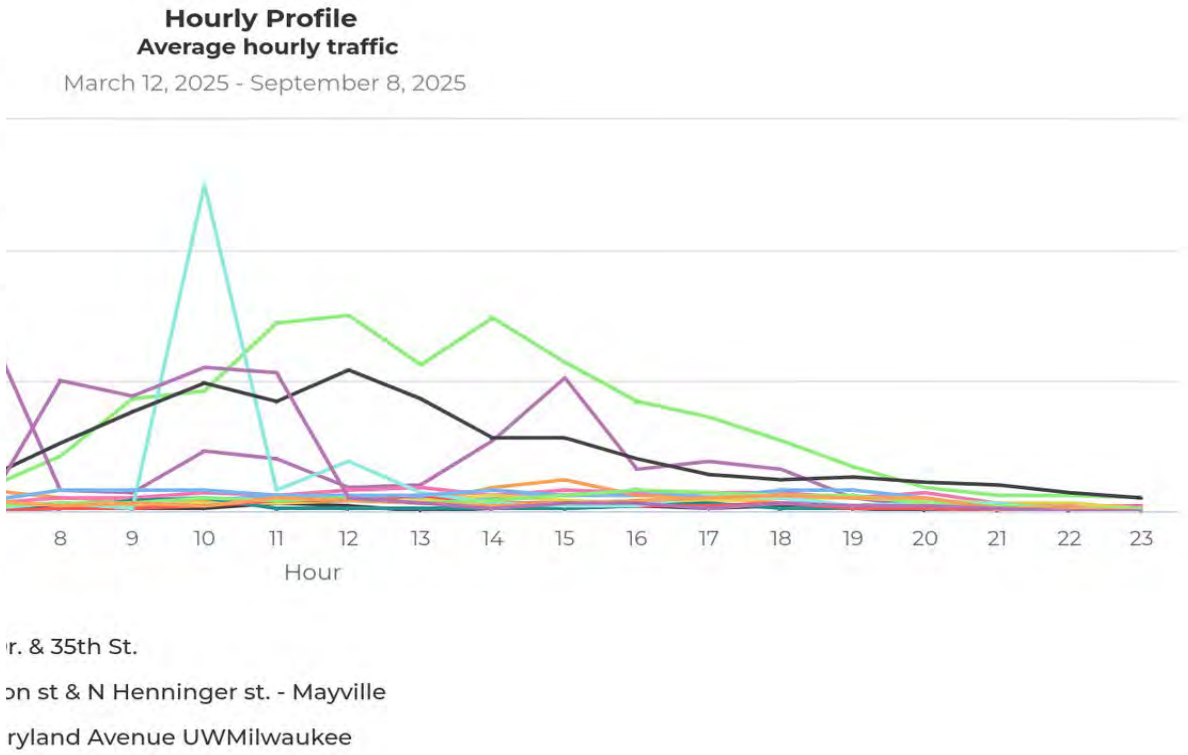
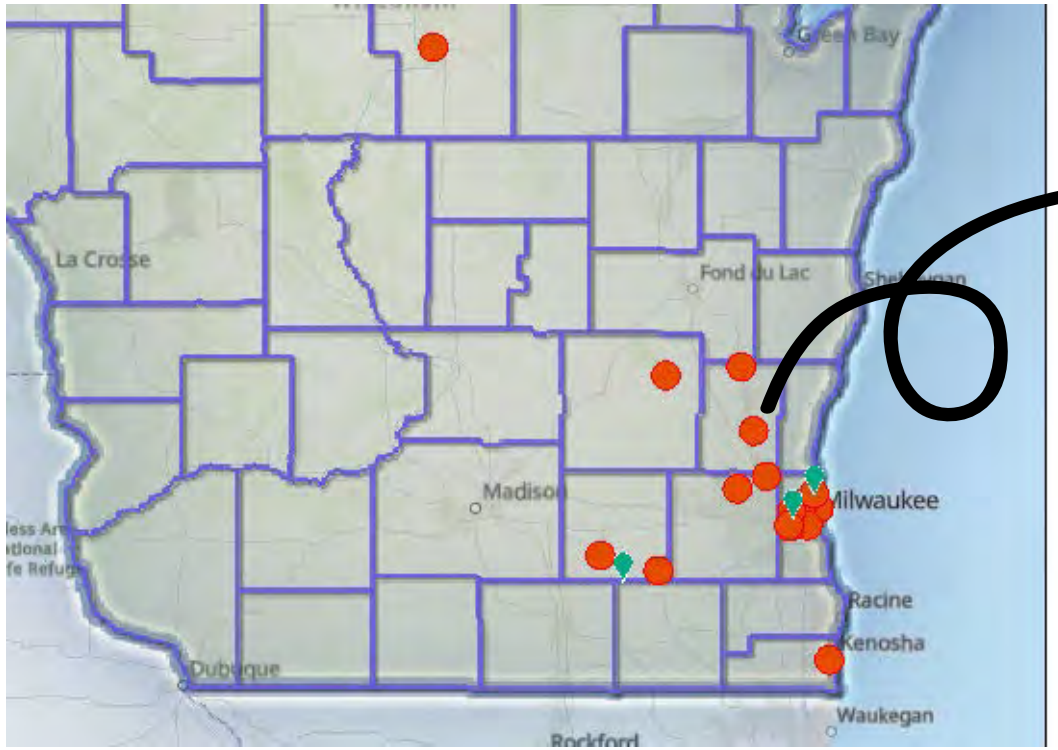
Preliminary Analysis (2024–2025)

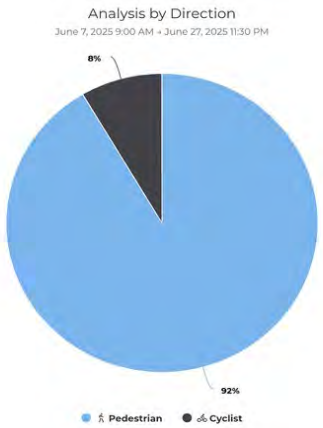
- Over 2.5 TB of data from the UW-Whitewater site
- Viva sensor consistent daily counts
- Eco-Counter peak hours match school & weekend activity





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





Total Count	Peak day	Daily Average	Peak Month Count
Whole P... South St. & Western Av...	Whole P... South St. & Western Av...	Whole P... South St. & Western Av...	Whole P... South St. & Western Av...
Total	Peak Day	Daily Average	Total
507	Sunday Jun 22, 2025 — 81	24	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

RE: [External]Request for

Re: Pilot Wisconsin Pedestrian and Bicycle Count Program

Amsden, Mike <Mamsde@milwaukee.gov>
To Olanrewaju Emmanuel Ogunniyi
Cc Yan, Amber - DOT; Mohammad Wael Amer; Yang Li
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 <ogunniy2@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 <ogunniy2@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.

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Challenges & Solutions

Weather Disruption Counter and Camera Maintenace

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 retriction

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

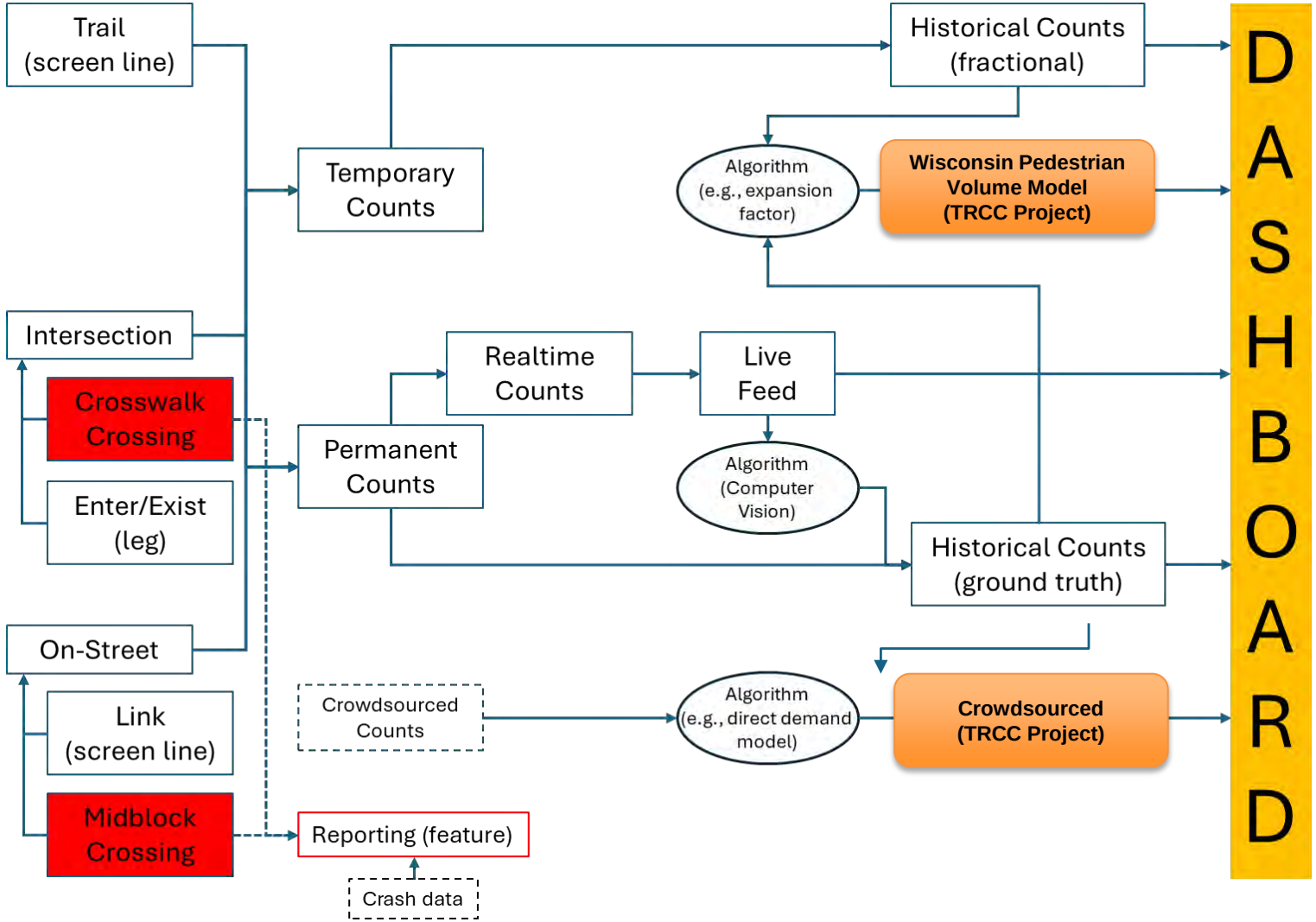
Solution: Proposed the use of portable power supplies and early engagement with municipal DPW to build trust and understanding.

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

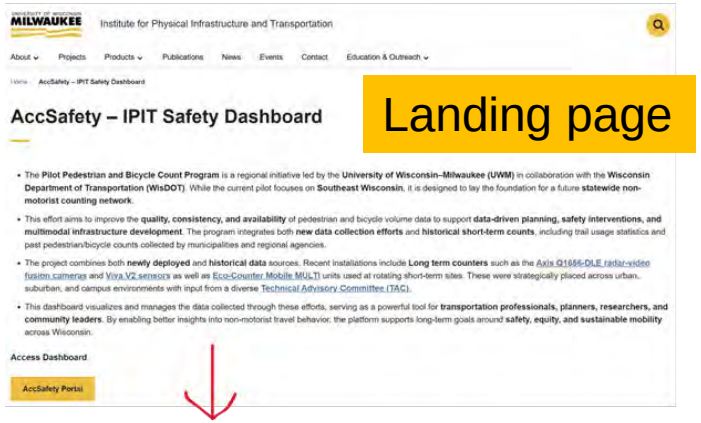


FUTURE INTEGRATIONS

- 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…

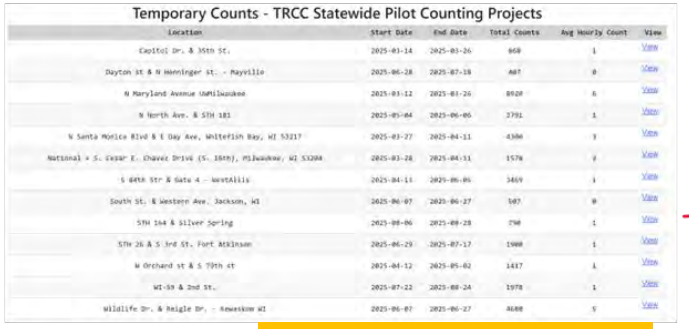
https://uwm.edu/ipit/wi-pedbike-dashboard/

Dashboard in Action

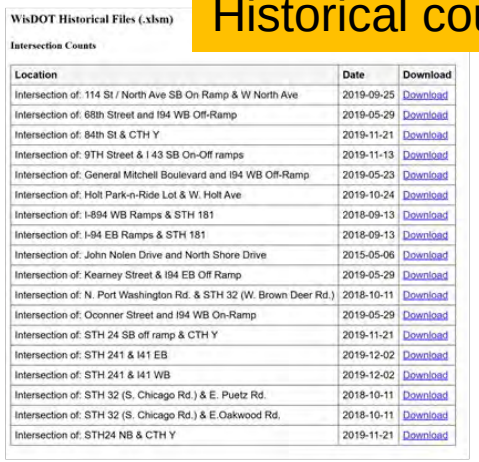


Landing page

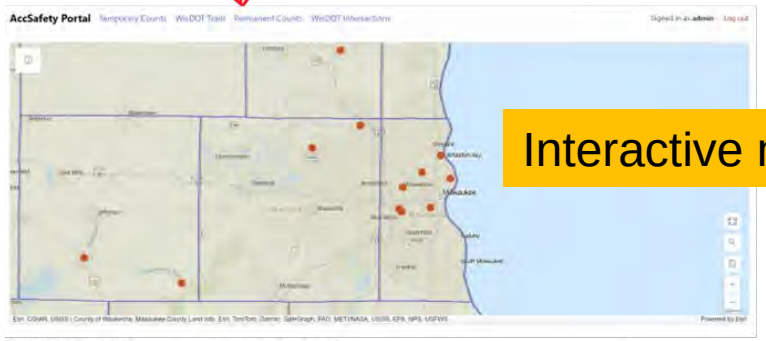
Login page



Historical counts



Statistics page



Interactive map

Live feed

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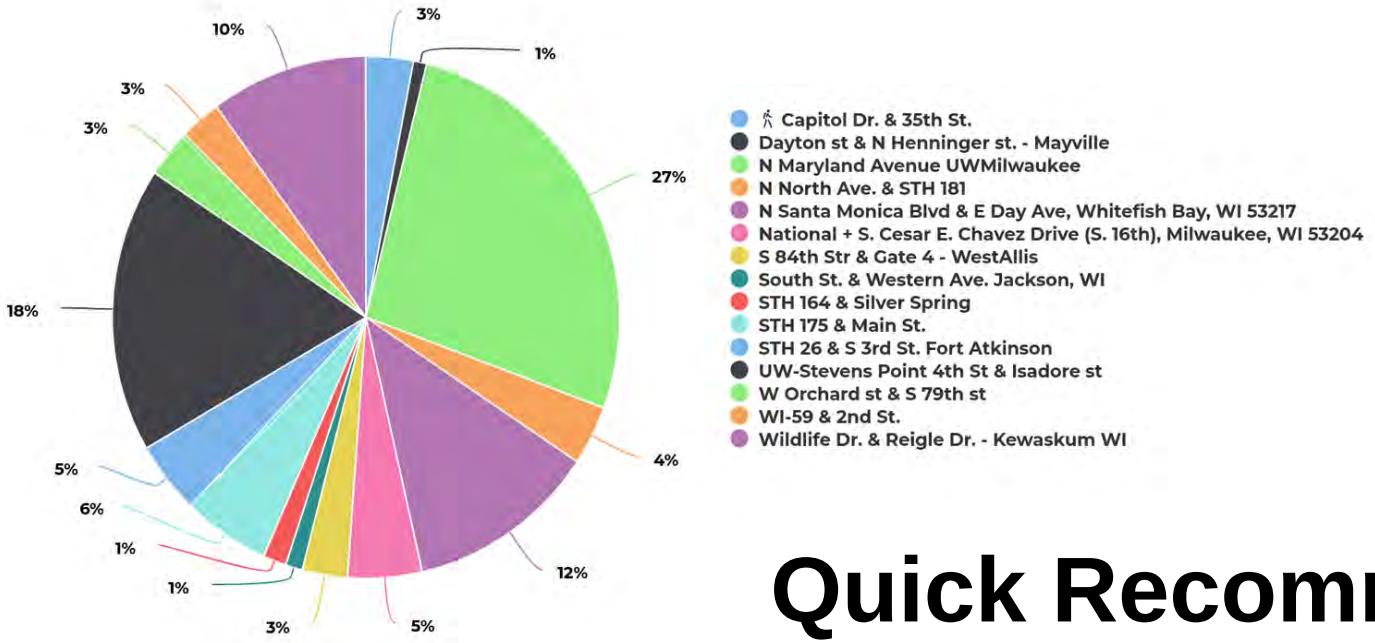
Summary of Impact

- 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.

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

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Thank You

Any Questions?

Acknowledgment:

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

Contact:
Yang Li | yangli22@uwm.edu