Feel the Heat at Trail Crossings of Busy Roadways

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Newtown Rail Trail
- Bucks County
- 2.5 miles existing
- 6 miles more planned

Pennypack Trail
- Montgomery County
- 6.2 miles between Philadelphia Line and Bucks Co.
- 10.2 miles more in Philly to Delaware River and East Coast Greenway
Pennypack Trail Crossing of Terwood Road

Challenges:
- 35 posted Speed Limit
- Traffic Volume: 6400 veh/day
- Skewed existing railroad crossing and adjacent bridge over Pennypack Creek
- Driveway to adjacent office building
- Terwood Rd is State Route 2033
Pennypack Trail Crossing of Terwood Road

Solutions (2015):

- Rectangular Rapid Flashing Beacon (RRFB), one over each lane
- Ped Push button for RRFB
- Two crosswalks to create perpendicular road crossing
- Shark Tooth Yield Line with R1-5L
- Advance warning signs and pavement legends
Additional Challenges After 2015:

- Trail Users not using push button to activate RRFB
- Trail Users crossing diagonally
- Vegetation (potentially) limiting sight distance
- Less than 100% of motorists yielding to trail users
- Pedestrian injury crash 2020
• Thermal Detection Camera / Detection Zones
Terwood RRFB Upgrade – Differences?

Before (2015)  
After (2022)
Terwood Road Mid-Block Crossing Upgrade

- Three RRFB signals each direction
- 3 Thermal Detection Cameras
- Overhead “Yield to Ped” sign
- Yield to Ped in-road Placard
- Shark Tooth yield line with sign
- Ped Push Button as backup
- FYG signs
- Pavement reflectors
- New street light over crossing
Terwood Road Mid-Block Crossing Upgrade

- Advance flashing warning sign interconnected with RRFB thermal cameras and push button
- Only flashes when RRFB is activated
- One on each side of the RRFB
Terwood Road RRFB Upgrade

- Three thermal detection cameras
- Adjustable detection zones
Pennypack Trail – Lessons Learned

- Design for human error

- RRFB signal using thermal detection camera effective for trail crossings at higher volume roads

- Advance “wig-wag” light with warning sign an effective supplemental element

- Second time is the charm!

Source: Google Maps Streetview
Newtown Rail Trail
Crossing of County Line Rd.

Challenges:
- 40 posted Speed Limit (85\textsuperscript{th} per. : 47mph)
- Traffic Volume : 9500 veh/day
- Skewed existing railroad crossing
- Existing traffic signal & left turn lane (400’)
- State Route 2038
- Signal Warrant
- Vehicle delays on side road
Newtown Rail Trail
Crossing of County Line Road

Solution:
- New traffic signal at New Road
- Based on Pedestrian Signal Warrant using trail count data
  - Vehicle delay on side street
  - Fencing to direct trail users to signal
  - Fiber optic interconnect to adjacent signals
Newtown Rail Trail
Crossing of County Line Road

Solution:
- Countdown Timers

- Raised concrete island for ped refuge/traffic calming

- Motion sensor / Accessible Ped Signal with audio message

- Street light

- High visibility crosswalk

- ADA compliant ramps
- Trail Wayfinding signs
Lessons Learned
- New traffic signal was effective solution
- Trail count data is as important as traffic data
- Municipal support was vital dealing with PennDOT
- Fiber optic improvements assisted with win-win solution
Thank you!

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