Designing Safer Trail Crossings: Lessons Learned from a Pre-Post Improvement Study?
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Presented By
- Letty Schamp, PE
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  Transportation Planner, Stantec
Heritage Rail Trail

- 6.1 miles
- Old Hilliard to near Plain City
- Multiple Jurisdictions
- Only four street crossings

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Heritage Rail Trail - Suburban

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Heritage Rail Trail - Urban

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HRT/Cosgray: Before Project

aerial view

Motorist view NB

Motorist view SB

Trail user view NW

Speed limit doesn't really match roadway character.
Goals of the Improvement Project

Decrease trail user delay and improve safety, particularly at peak periods.

Increase motorists yielding to trail users.

Improve sight lines, visibility, and conspicuity of crossing.

Lower vehicle speeds.

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Goals of the Improvement Project

Decrease trail user delay and improve safety, particularly at peak periods → RRFB

Increase motorists yielding to trail users → Realign Path, improve signage, add lighting

Improve sight lines, visibility, and conspicuity of crossing → Curb, RRFB, Signage

Lower vehicle speeds → RRFB
Before Project

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After Project

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Evaluating The Improvement Project

Increase motorists yielding to trail users

Improve sight lines, visibility, and conspicuity of crossing

Lower vehicle speeds

Decrease trail user delay and improve safety, particularly at peak periods

Did it work and to what degree?

Next Step: Evaluation Study
Evaluation Study: Data Collection

- Video Recording and Interpretation
- In-person Observation
- Speed Detection Devices
Evaluation Study: Data Collection

- Before (March ‘15)
- After 1-2 Month (June/July ’15)
- After 5 Months (Oct ’15)
- After 15 Months (Jul/Aug ‘16)
Evaluating The Improvement Project

Increase motorists yielding to trail users → RRFB

Improve sight lines, visibility, and conspicuity of crossing → Realign Path, improve signage, add lighting

Lower vehicle speeds → Curb, RRFB, Signage

Decrease trail user delay and improve safety, particularly at peak periods → RRFB
Evaluating The Improvement Project

Decrease trail user delay and improve safety, particularly at peak periods → Output

Increase motorists yielding to trail users → Output

Improve sight lines, visibility, and conspicuity of crossing → Outcome

Lower vehicle speeds → Output
Evaluating The Improvement Project

Decrease trail user delay and improve safety, particularly at peak periods → Output

Increase motorists yielding to trail users → Output

Improve sight lines, visibility, and conspicuity of crossing → Outcome

Lower vehicle speeds → Output
Evaluating The Improvement Project

Decrease trail user delay and improve safety, particularly at peak periods

Pre-post study

Increase motorists yielding to trail users

Before ≈ Control

Improve sight lines, visibility, and conspicuity of crossing

Lower vehicle speeds

Output

Output

Outcome
Evaluation: Level of Service

Change in Level of Service for Groups, Over Time

Before

After 1 Mo.

After 5 Mos.

0% 20% 40% 60% 80% 100%

LOS A  LOS B  LOS C  LOS D  LOS E  LOS F

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Evaluation: Level of Service

Level of Service for Groups, While the Beacon is Flashing or Not, Over Time

Before (No Beacon)

After 1 Mo. - Flashing

After 1 Mo. - Not Flashing

After 5 Mos. - Flashing

After 5 Mos. - Not Flashing

LOS A  LOS B  LOS C  LOS D  LOS E  LOS F

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Evaluation: Level of Service

Worse LOS for Beacon Users – Why?

- Most Don’t Want to Stop If They Can Avoid It.
- Many Users (Bicyclists) Look for a Gap on Approach, Vary Speed, and Cross Without Stopping.
- One Must Stop to Activate Beacon.
Evaluation: Level of Service

Level of Service for Groups with Delay > 4 Seconds, While the Beacon is Flashing or Not, Over Time

- Before (No Beacon)
- After 1 Mo. - Flashing
- After 1 Mo. - Not Flashing
- After 5 Mos. - Flashing
- After 5 Mos. - Not Flashing

LOS A, LOS B, LOS C, LOS D, LOS E, LOS F

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Evaluation: Vehicle Yielding

Likelihood of Vehicle Yielding With or Without Flashing Beacon for Groups with Delay > 4 Seconds, Over Time

Before

Yield with Flasher
Yield without Flasher
No Yield with Flasher
No Yield without Flasher

After 1 Month

After 5 Months

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Evaluation: Vehicle Speed

Cosgray Road — 85th Percentile Speed

<table>
<thead>
<tr>
<th></th>
<th>Before (Jan ’15)</th>
<th>After 1 Mo. (Jun ’15)</th>
<th>After 5 Mos. (Sept ’15)</th>
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<tbody>
<tr>
<td>North of Crossing</td>
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<td>NB</td>
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<td>SB</td>
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<tr>
<td>At Crossing</td>
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<td>South of Crossing</td>
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</tr>
</tbody>
</table>
Evaluation: Vehicle Speed

Percent “Excessive Speed” (15+mph Speed Limit)

Before (Jan ’15)
After 1 Mo. (Jun ’15)
After 5 Mos. (Sept ‘15)

North of Crossing
At Crossing
South of Crossing

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Evaluation: Other Observations

Percentage of Users who Activated the Beacon or Crossed While it Flashed, Over Time

After 1 Month

- Activated Flasher: 20%
- Inactive Flasher: 80%
- Benefited from Activated Flasher: 40%
- Did Not Activate Beacon: 60%

After 5 Months

- Activated Flasher: 40%
- Inactive Flasher: 60%
- Benefited from Activated Flasher: 80%
- Did Not Activate Beacon: 20%

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Evaluation: Other Observations

Percentage of Users with Delay >4 Seconds who Activated the Beacon, or Crossed While it Flashed, Over Time

After 1 Month

After 5 Months

Activated Inactive Flasher

Benefited from Activated Flasher

Did Not Activate Beacon

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Evaluation: Other Observations

Button Placement
Evaluation: Other Observations

Button Placement

Approximate Distance (feet) Groups Waited From the Roadway Edge

Visibility vs. Proximity to Traffic Considerations
Evaluation: Other Observations

Lighting
Evaluation: Other Observations

Lighting
Evaluation: Other Observations

Lighting
Evaluation: Other Observations

Lighting
Lighting
Evaluating The Improvement Project

Decrease trail user delay and improve safety, particularly at peak periods

Increase motorists yielding to trail users

Improve sight lines, visibility, and conspicuity of crossing

Lower vehicle speeds
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Lessons Learned

Push Button Location
- Consider using separate pedestal

Curb Placement
- Case-by-Case Basis

Lighting
- Something is better than nothing
- Front lighting is preferred.
Conclusions

Study the Crossing

- Needs of the Crossing? Visibility, Gaps in Traffic, etc.
- Overlap in Trail/Road Peak Hours?
- RRFBs Can Help But Can Be Overused
- Medians Are Also Helpful
Conclusions

Final Thoughts

- Most motorists want to do the right thing, but they don’t always know what that is. The American culture is more auto-centric and trail users tend to be more passive.

- RRFB gives considerate drivers the validation they need to yield without inciting road rage behind them.

- RRFB gives trail users more confidence to take their legal right to cross the street without risking a close call.
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