Pedestrian Collision Warning Demonstration Project

TriMet Board of Directors

May 27, 2015

Demonstration Project Overview

Study was funded through a FTA Cooperative Agreement

Study Objectives

1. Demonstrate ability of available warning systems
2. Determine effectiveness of these systems at intersections and bus stops
3. Determine cost-benefit
4. Define when systems should be provided
5. Assess effectiveness at one intersection

Technologies Assessed

- System 1: Spoken warning activated by steering wheel, with strobe lights
- System 2: Spoken warning activated by steering wheel
- System 3: Beeping warning activated by turn signal, with directional LED headlights
- System 4: Fixed location BUS Blank-Out Sign
- Other: Spoken warning activated by turn signal (assessed but not tested)

System 1

Spoken warning activated by steering wheel, strobe lights

System 2

Spoken warning activated by steering wheel

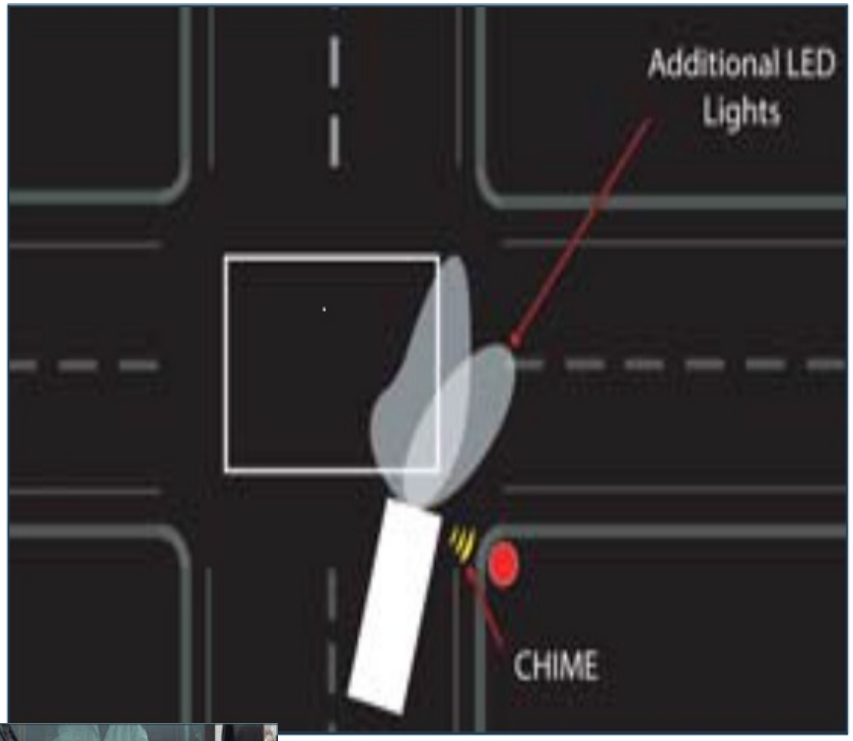
System 3

Beeping warning activated by turn signal, directional LED headlights

System 4

Fixed location BUS Blank-Out Sign


3048


Additional LED
Lights
CHIME


E256345
3048

Process

- Approach
  - 45 buses
  - 5 routes
  - 7 months
  - One fixed location warning sign at SW 5th/Burnside
- Evaluation
  - Operator surveys & focus groups
  - Pedestrian surveys & focus groups
  - Staff interviews and cost benefit analysis

System Findings

- Warning volume
- Sensitivity of warning activation
- Warning type
- Application of warnings

Technology Effectiveness

- Bus operators less favorably impressed with effectiveness of warning systems than general public

- Majority of pedestrians felt the systems were effective in alerting pedestrians and improving safety

Acceptance of Technologies

Operators

- Nearly half agree safety benefits outweigh drawbacks, but most seemed skeptical

Pedestrians

- Did not find warnings intrusive and that more systems should be installed but some cautioned that dollars could be better spent elsewhere

Options for Improving Technologies

- “Tweak the system”
- Integrate systems with GPS/ AVL system
- Operator control

Cost Benefit Analysis

- Number of variables influence Rate of Return
- Rates of Return for audible warning systems were found to range from 51.4% - 16.5%, with the baseline of 34.5%

Considerations

- Audible warning systems were found to be effective
- Systems are cost-effective technology
- Pedestrian warning technology continues to evolve
- Two emerging technologies that show promise
  - Eagle Eye – analytic video-based technology
  - Protran – Radar-based technology

Next Steps

Defer decision until:

- New emerging technologies are evaluated
- Create an internal team to recommend best technology fall 2016