Advanced Accessible Pedestrian Signals

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http://www.ece.uidaho.edu/ee/digital/rwall/research/transportation/penn_state.pdf

Presentation Outline

• Motivation for research
• Approach
• Results
• Future Direction
• Bibliography
1. Motivation

• Smart Signals - a solution looking for a problem?

Present Paradigm

• New technology dependent on archaic infrastructure
• MMU (CM) not capable of monitoring pedestrian failure modes
Proposed Paradigm

- Pedestrian control hardware detached from pedestrian signals
- Information specific pedestrian calls

AAPS Information Network Approach

Advanced Smart Signals Pedestrian Call System
Maintenance PC Interface
http://wallonr.ece.uidaho.edu:8080/smart_signals.html

Advanced Accessible Pedestrian Management System

Advanced Pedestrian Controller (APC)
Advanced Pedestrian Button (APB)

Smart Pedestrian Signals Software

- Information Flow Diagram
  - 220 ms network update

- Encrypted Ethernet over Power line Communications (BPL)
Smart Signals Research
Advanced Pedestrian Assistant

• What is it:
  – A handheld device for activation of pedestrian calls
  – Provides orientation and guidance information to user while in intersection
  – Interacts with traffic controller to protect user

• Why is it needed:
  – 4.3 million Americans are severely visually impaired
  – Incidence increases with age
  – By 2010, expect there to be 20 million visually impaired persons over age 45

Advanced Pedestrian Assistant

• Infrastructure Problems: impediments for vision and mobility impaired

Inaccessible Pedestrian Button
Unusual intersection geometries
Advanced Pedestrian Assistant

• Functionality
  – Remote pedestrian button
  – APS audible messages
  – Navigation cues to user
  – Traffic control

Advanced Pedestrian Assistant

UI System

Nokia 6210
Advanced Pedestrian Assistant

• Preliminary test results

Conclusion

• Pedestrians at intersections are underserved
• Countdown pedestrian timers have limited functionality due to current engineering practices
• Better information can resolve some known issues
• Research in distributed technology for traffic controls will start with improving pedestrian access and safety.
Questions?

Smart Signals Bibliography

Pedestrian Safety Links

- **Pedestrian Forum - Summer 2008**  
  http://safety.fhwa.dot.gov/PED BIKE/ped/pedforum/pedforum_sum08.htm
- **Intersections**  
  http://safety.fhwa.dot.gov/intersections/intersectionsap.htm
- **Senior Pedestrian**  
- **Road Engineering Journal**  
  http://www.usroads.com/journals/p/rej/9710/re971002.htm
- **No signals**  
  http://www.bikewalk.org/pdfs/trafficcontrol_backtobasics.pdf
- **SPECIFICATIONS FOR PEDESTRIAN LED COUNTDOWN TIMER FEBRUARY 14, 2005**  
  https://www.nysdot.gov/portal/page/portal/divisions/operating/oom/transportation-systems/repository/pcdspec.pdf
- **NEMA TS2 Standard**  
  www.ite.org/standards/ITScabinet/ITS_Cabinet_v01.02.17a.doc
- **Low Vision Pedestrians**  