In-Roadway Crosswalk Lighting Systems

Presented by:

Roland Buehler

Advanced Delineation Systems Inc.

ITS Texas

November 14, 2002
In-Roadway Crosswalk Lighting Systems

• Issues/Concept
• Benefits
• Configuration
• Activation
• Technologies
• Other applications
Issues:

• Difficult to see crosswalk markings and pedestrians
• Overhead signs and lights not in direct line of sight
• Low levels of driver compliance
• Drivers tune out continuous warning devices
• Poor visibility in darkness, rain or fog
The In-Road Lighting Concept:

• Flashing amber lights, embedded in pavement

• Designed for uncontrolled crossings

• Push button and/or passive activation

• System is an enhancement to provide additional warning to motorists

• Now included in MUTCD
Benefits of In-Road Lighting:

• Positive effect on driver awareness
• Increase in driver compliance
• Improved pedestrian safety
• Low hardware cost
• Low operating costs
Typical Configuration:

• Lights installed along both sides of crosswalk

• Lights span entire width of roadway

• Amber lights flashing at 50-60 times per minute

• Uni-directional or bi-directional lights
Activation Methods:

• Active – push buttons

• Passive – infrared, ultrasonic, microwave, pressure pad

• Push buttons considered reliable, inexpensive and simple to maintain

• Passive detectors can reduce traffic disruption and ensure adequate crossing time
Available Technologies:

• Halogen lights
• Light Emitting Diodes
• LEDs with inductive power transfer
Studies – Common Conclusions

• Percentage of drivers yielding to pedestrians increases significantly

• In-pavement lights are most effective at night or during adverse weather conditions

• There is a significant increase in braking distance (effect is greater at night)
Other Applications of In-Road Lighting – Road Delineation

• Delineation vs illumination
• Can replace overhead lighting
• Economical alternative
• Superior driver guidance
• Effective in fog and rain conditions

Highway 1A, Boca Raton, Florida
Other Applications – Tunnels

• Center line and/or edge lighting
• Low cost hardware and installation
• Low maintenance and power consumption

Massey Tunnel – Vancouver, Canada
Other Applications – Railway Crossings

- Flashing red lights at crossing
- Enhancement to existing signals and gates
Other Applications – Airport Lead-in Lighting

• To guide pilots to gates
• Turned on when aircraft has landed
Other Applications cont’d

• Dual left turn lanes
• Hazardous curves
• Facility delineation (eg. Ferry terminals)
• Bridges (lane delineation)
• Freeway exits
Summary/Conclusions

• Experience suggests that in-road lights improve crosswalk safety

• Concept is now included in MUTCD (section 4L.01)

• Push button activation is most common

• Passive activation has advantages – more study needed