



TAC's ROAD SAFETY ENGINEERING AWARD

IN-PAVEMENT L.E.D. PEDESTRIAN CROSSWALKS CITY OF AIRDRIE, ALBERTA

Pedestrian Crosswalk Safety

Municipalities have the constant challenge to ensure pedestrian safety while minimizing driver frustration and balancing budgets. Driver complacency and attentiveness are the main causes for vehicle/pedestrian collisions. New products continue to emerge in the area of pedestrian crosswalk signage and lighting, of which in-pavement LED's (light emitting diodes) is one. Although in-pavement LED's are commonly used in regions with favourable climates, they have yet to be tested in the typical Canadian environment. In 2003, the City of Airdrie initiated a pilot project with the first generation of in-pavement LED's. Although driver and public response was very favourable, these LED's have not held up under the seasonal conditions. Snowplows and street sweepers have damaged the lenses on these LED's to the point they were not functioning as intended.

In-Pavement LED Development

The City of Airdrie identified the positive outcomes from the 2003 pilot project and researched further developments on available products. A product emerged as a potential solution to the challenges the City had in 2003. The "Lanelight LED In-pavement Markers" (Photo #1) appeared to address the snowplow concerns from the first installation. These LED's are encased in stainless steel and have a flat profile in the road. Other benefits to the Lanelight product are ultra-bright LED's (1.6 million candela/m²) with automatic night dimming and maintenance free design (road grit self flushes from lenses). The question remained, would these markers withstand the extreme seasonal conditions of southern Alberta?

Crosswalk Installation

City of Airdrie's core values include a commitment to improve services to our customers and using roadblocks to stimulate new thinking. The City also takes responsibility for risks to achieve innovative outcomes. The City envisions in-pavement LED's as the next generation of crosswalk safety. These markers gain the attention of the driver while keeping their eyes on the road.

The City of Airdrie commissioned a local firm to install 2 in-pavement LED crosswalks along Main Street adjacent to Nose Creek Park. Nose Creek Park is a central park and venue to many large, year-round events. Main Street is a 4-lane undivided arterial road with curvilinear geometrics and traffic volumes recorded at 12,000 AADT.

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Pedestrian crosswalk warrants were conducted at these 2 locations utilizing a warrant system developed by the City of Calgary. A pedestrian activated crossing is considered to be warranted if the data collected provides a value of 80 points or more. Although these 2 locations did not meet the threshold value, they had significant results to be good candidates for this pilot project.

The in-pavement LED's were installed in October, 2007 and both crosswalks were completed in 5 days. A total of 14 LED markers were installed at each crosswalk, 7 facing each direction of traffic (see attached drawing). To supplement the in-pavement LED's, flashers were installed in the RA-4 pedestrian crosswalk signage (Photo # 2). Also, one of the crosswalks had curved approaches and advance warning flashers were installed on the WC-2 signage.

LED technology has several advantages over incandescent lights, long lasting and low wattage requirements are the two primary ones. Power consumption of one crosswalk equated to approximately 90 watts at a constant draw. Since crosswalks are not utilizing a constant electrical current, alternate power sources were investigated. Solar power for these crosswalks was an attractive source as it is economical, environmentally friendly and allowed for quicker installation. Each crosswalk has a stand-alone battery power supply, continually charged with a 600mm x 1200mm solar panel mounted on top of one of the pedestrian activation poles (Photo # 3). The battery is expected to have a 5 year life under normal use.

Conclusion

The City of Airdrie continues to monitor the crosswalks through the winter months and to the 1st of March, 2008, no noticeable damage has occurred to the markers as a result of winter activities (snowplows and sanders). Public feedback has been very positive to these crosswalks both from the drivers and the pedestrians.

The cost for supply & install of the 2 crosswalks totalled \$68,000 (\$34,000 per crosswalk). In comparison, a conventional above-ground lighted crosswalk would typically cost \$50,000. There are many variables when selecting a crosswalk design such as type of structure, power source, and site conditions. This cost comparison was intended to show in-pavement technology is comparable to conventional designs.

The City of Airdrie is encouraged by the results of this recent installation and considers this technology as an important step in improving road safety for all users. In-pavement LED's may become the standard for lighted crosswalk installations in Airdrie.

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