Date: 29 May 2003

BY FAX AND COURIER

Pedestrian Project Award
C/o Institute of Transportation Engineers
1099 14th Street, NW, Suite 300 West
Washington, D.C.
20005 USA

Dear Sir/Madam:

Re: Pedestrian Project Award

I would like to submit our recent research project on pedestrian (or half) signals in British Columbia, Canada for consideration for the above award. Our study was undertaken by Creative Transportation Solutions Ltd. in association with LCP Signal Management Inc. to quantify operational problems with a common traffic control device observed in urban areas of British Columbia.

Key reasons we believe our project to be worthy of consideration for this award are:

- As a result of our research, a joint national study is now underway to conduct a technical review of the current design. The study is being conducted by the Canadian Institute of Transportation Engineers (CITE), the Insurance Corporation of B.C. (ICBC), the ITE Greater Vancouver Section of ITE and the Transportation Association of Canada (TAC).

- Our research was considered in the decision to amend the U.S. MUTCD to no longer permit pedestrian (or half) signals to be installed at intersections.

- Our work on the operation, design and placement of pedestrian (or half) signals has influenced a number of agencies and traffic engineering professionals in North America. This is positive news for the primary beneficiaries of this traffic control device, namely the pedestrians.

- The research project was conducted at the initiative of CTS and LCP, and internally funded.
1.0 BACKGROUND

Pedestrian (or half) signals have been in use in British Columbia for over 35 years. They are installed at both intersections and mid-block locations where there are typically moderate to high pedestrian volumes. At intersections (where the majority of B.C.'s pedestrian signals are installed), they are often installed because the location does not meet the warrant for a full traffic signal.

Pedestrian signals have become a popular alternative traffic control device for public agencies to implement. For example, the City of Vancouver has nearly 260 pedestrian signals in operation of which 50 have been installed in the last 5 years. Typically, 9 or 10 new pedestrian signals are installed each year in Vancouver.

The Pedestrian Crossing Control Manual for British Columbia was first published by the B.C. Ministry of Transportation & Highways in April 1994. This document provides operational guidelines and warrants for the deployment of pedestrian crossing devices, including signals. In March 1998, the Transportation Association of Canada (TAC) published the national Pedestrian Crossing Control Manual with the same primary purpose as the April 1994 B.C. manual. Both documents were intended to augment the Manual of Uniform Traffic Control Devices (MUTCD) published by TAC. The significant difference between the two documents with respect to pedestrian signals is that the B.C. manual specifies the use of a flashing green ball display while the TAC manual specifies the use of a solid green ball display during the "rest" state of the signal. Both manuals specify the use of Stop Signs for side street control at a pedestrian signal that is located at an intersection.

In December 2000, the U.S. Department of Transportation and the Federal Highway Administration issued the MUTCD 2000 Manual on Uniform Traffic Control Devices Millennium Edition. In this document, the flashing solid green ball display is not recognized as a valid signal display. As well, the manual states that stop signs for side streets or driveways shall not be used in conjunction with a traffic control signal operation unless the volumes are so low that an extremely low potential for conflict exists.

Observations in the past ten years and recent newspaper articles have indicated that many motorists on the side street tend to ignore the stop sign control during the pedestrian phase. This has significant safety implications on the primary user of the pedestrian phase of the signal, namely the pedestrians. As well, significant design variations have recently been deployed or tested. These include the following:

- The use of red flashing overhead signals for the stop controlled approaches.
- The installation of countdown timers for pedestrian movements at some locations (some are placed as part of the pedestrian signal heads while others are placed separately as an overhead indication) (See FIGURE 1).
- The use of vehicle detection loops on the side street for actuation of the pedestrian phase for the use of motorists (See FIGURE 1).
- The use of transit vehicle detection loops on the side street to activate the pedestrian signal (See FIGURE 2).

Some of these variations have the potential to confuse road users, since they are inconsistent with TAC and B.C. standards.
FIGURE 1

PEDESTRIAN SIGNAL IN RICHMOND, B.C. ILLUSTRATING USE OF A COUNT DOWN TIMER THAT IS INSTALLED WITHIN THE CONE OF VISION OF SIDE STREET MOTORISTS. THERE IS ALSO VEHICLE DETECTION FOR THE SIDE STREET TRAFFIC TO ACTIVATE THE PEDESTRIAN PHASE, AND A FLASHING RED SIGNAL HEAD TO EMPHASIZE THE REGULATORY STOP SIGN CONTROL. NOTE THE EXISTENCE OF ONLY ONE MARKED CROSWALK CROSSING THE MAIN STREET.
FIGURE 2

PEDESTRIAN SIGNAL IN NEW WESTMINSTER, B.C. INCLUDING SPECIAL BUS TRANSIT DETECTION FEATURES WHICH ARE A COMBINATION OF ROADWAY DETECTOR LOOPS AND A SONIC HEIGHT SENSOR TO DETECT A STANDARD 12 METRE (40 FOOT) BUS. NOTE THAT THE TRANSIT PRIORITY SIGNAL HEAD IS DISPLAYED CONCURRENTLY WITH THE PEDESTRIAN WALK DISPLAY.
2.0 PROJECT

2.1 Objectives

In 2000, Creative Transportation Solutions Ltd. (CTS) and LCP Signal Management Inc. (LCP) conducted a self-funded research project to review British Columbia's (B.C.) existing pedestrian signal operations in order to identify operational and safety concerns, and quantify some problems that have been observed with their use.

2.2 Results

Motorist's non-compliance with a pedestrian crossing device presents a significant risk to pedestrians. In order to quantify the observed poor stop sign control compliance for B.C.'s pedestrian signals, CTS staff conducted a special survey at twelve pedestrian signals located throughout Greater Vancouver in the summer of 2000. The collected data was tabulated and analyzed to ensure its integrity and validity.

The conclusions of the pedestrian (or half) signal research project were as follows:

1. Features of B.C.'s pedestrian signal operation are unique to North America.
2. Conflicting vehicle and pedestrian control on each leg is confusing to both road users and pedestrians.
3. The flashing green ball display is not supported by TAC nor by the U.S. Manual on Uniform Traffic Control Devices.
4. The U.S. Manual on Uniform of Traffic Control Devices does not support the use of stop signs at signalized intersections for side streets or driveways unless the volumes are so low that an extremely low potential for conflict exists.
5. The observed stop sign violation rates at 10 of the 12 surveyed pedestrian signals exhibit unacceptable motorist behaviour, which can be dangerous to all users of the intersection.
6. Non-compliance with stop sign by side street motorists during the pedestrian phase was found to increase as main street volumes increased.
7. Both the B.C. and TAC pedestrian signal designs include the following features which should be reviewed in light of the findings contained in this paper:
   - Use of stop sign control on the side street(s);
   - Lack of pedestrian crossing control across the side street;
   - Lack of pedestrian crossing control across one of the two main street approaches; and
   - The appropriateness of installing pedestrian signals at intersection locations.
8. Design of traffic control devices should not promote the abuse of traffic control facilities. Traffic control devices must convey a clear, simple meaning to motorists, cyclists and pedestrians. Based on our observations and data collected to date, it is our position that the current design and application of B.C.'s pedestrian signals have deficiencies in this regard.

Our key recommendation was that a further technical review of these issues be conducted and this review should include a review of design, operational and safety issues.
As a result of our research, a joint national study is now underway by the Canadian Institute of Transportation Engineers (CITE), the Insurance Corporation of B.C. (ICBC), the ITE Greater Vancouver Section of ITE and the Transportation Association of Canada (TAC) to conduct a technical review of the current design.

3.0 PARTICIPATING ORGANIZATIONS

3.1 Creative Transportation Solutions Ltd.

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3.2 LCP Signal Management Inc.

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7.0 OTHER DETAILS

7.1 Project Sponsors

The research project was sponsored by CTS and LCP, including subsequent travel to present the findings to transportation professionals across North America.

7.2 Costs

There was no set budget as the project. However, a rough estimate of the budget based on the level of effort by Mr. Voss, staff at CTS and Mr. Parks is CDN$20,000.00.

7.3 Project Duration

The core research project was completed within 6 months in the summer and fall of 2000.
After the research was done, Mr. Voss attended the following conference and/or trade shows to raise awareness of the technical findings and recommendations from the work completed by CTS and LCP:

2) IMSA BC Section Trade Show, Burnaby, B.C., May 2001
3) ITE Spring Conference, Tampa, Florida, March 2002
4) TAC Spring Conference, Hull, Quebec, April 2002
5) CITE Annual Conference, Ottawa, Ontario, May 2002

Copies of the research paper can be found in the compendiums for conference / trade shows 1, 3 and 5 above.

Please call the undersigned should you have any questions or comments regarding our submission. We look forward to your favourable response.

Yours truly,

CREATIVE TRANSPORTATION SOLUTIONS LTD.

[Signature]

Jan Voss, P.Eng, PTOE
President

cc. Mr. Larry Parks, LCP Signal Management Inc.