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TRAFFIC CONGESTION MANAGEMENT THROUGH ADAPTIVE TRAFFIC CONTROL SYSTEM –TRANSPORT CANADA INTELLIGENT TRANSPORTATION SYSTEM (ITS) FUNDING

The Transportation and Works Committee recommends the adoption of the recommendations contained in the following report, February 17, 2005, from the Commissioner of Transportation and Works:

1. RECOMMENDATIONS

It is recommended that:

1. The Region enter into a contract with Delcan Corporation in respect of professional services in the amount of \$324,900 pursuant to the sole source provisions of the Purchasing By-law.
2. The Regional Chair and Regional Clerk be authorized to execute a contract subsequent to Recommendation 1, subject to the prior review of Legal Services.
3. The Commissioner of Transportation and Works be authorized to enter into an agreement with Transport Canada for 50% funding of a \$500,000 Intelligent Transportation System (ITS) project, as outlined in this report.

2. PURPOSE

This report seeks authorization to enter into an agreement with Transport Canada for funding of 50%, up to \$250,000, under Canada's Intelligent Transportation Systems Deployment and Integration Plan.

In addition, this report seeks authorization for Delcan Corporation to provide software development consulting services for this project. This project provides an adaptive traffic control system for urban congestion management in support of the current Region's Centralized Traffic Control System (CTCS).

3. BACKGROUND

Transport Canada invited proposals from municipal and private sector alliances to fund and implement Intelligent Transportation Systems (ITS) throughout Canada. The financial support offered to Canadian agencies is 50% of total eligible expenditures up to a maximum of \$250,000, for ITS projects meeting certain objectives and criteria.

In response to this call for proposals, Region staff and Delcan Corporation prepared a proposal to Transport Canada. The proposal detailed an ITS project consisting of the development of adaptive traffic control functionality as an enhancement to the Region's CTCS. This proposal was submitted to Transport Canada in September 2004. On January 12, 2005, Transport Canada notified staff the proposal for funding was accepted.

One of the conditions for the funding requires a partnership be formed between the public and private sector. As a result, Delcan Corporation will provide an "in-kind" contribution to the project of \$20,000. The contribution will be in the form of time and effort provided by their staff. The value of this contribution is calculated by measuring "in-kind" hours worked on the project multiplied by salary cost, plus overhead, without profit. The "in-kind" contribution will be shown as a credit on the claims for progress payments.

The Region and Delcan Corporation, together, own the proprietary software used within the CTCS. Therefore, Delcan Corporation has integral knowledge of the software. As a result of the proprietary vendor specific software, it is not appropriate to obtain proposals from other software development consultants for this project.

This project must be completed by 2006 and is a shared cost initiative with the Region and Federal government providing one half of the funding. Transport Canada will provide a maximum contribution of \$250,000 toward the proposed project.

4. ANALYSIS AND OPTIONS

A joint proposal was prepared and submitted to Transport Canada. The proposal included details of the project and its relevance to the ITS plan. The project proposal outlined the following major activities:

- Define the system requirements for implementation of adaptive signal control.
- System architecture encompassing all of the requirements identified.
- Procurement and procurement management.
- System and software design.
- Software development.
- Traffic control parameters and test plans.
- Integration and testing.
- Operations, evaluations and maintenance.

In addition to the above program activities, the Region must enter into an agreement with Transport Canada to establish the equal funding arrangement.

4.1 Adaptive Traffic Control Signal Operation

Currently, traffic control signal timing is pre-determined and defined for traffic control signals along the Regional road network. To overcome the short comings of pre-defined timing plans, some form of traffic adaptive control is necessary, where the system could respond to changes in the traffic demands by time of day and day of week in the network. With adaptive control, the operational timing plans are continually reviewed and changed by small increments to match the prevailing demand measured by on-street traffic detectors.

Adaptive traffic control accurately predicts traffic patterns and recommends optimal signal timing parameters in response to changing on-street traffic volume patterns. This functionality is effective over a wide range of traffic demands, including peak hour periods, to provide quick responses to the dynamic situations, thereby reducing congestion.

This is a pilot project of adaptive traffic control signal operation for a small group of signalized intersections yet to be determined. The pilot would select intersections that currently experience a wide range of traffic patterns throughout the day and for different days of the week, including heavily congested conditions. If successful we will expand to other parts of the Region.

It is proposed that Delcan Corporation be authorized to undertake the consulting portion of this assignment, and that the Commissioner of Transportation and Works be authorized to sign all applicable applications and agreements with Transport Canada for the funding of this project.

4.2 Purchasing By-law

The Region and Delcan Corporation own the proprietary software used within the CTCS, and therefore, have integral knowledge of the software. The software developed within this project will continue to be owned by the Region. As a result of the proprietary vendor specific software, it is not appropriate to obtain proposals from other consultants to implement this project.

5. FINANCIAL IMPLICATIONS

Funds are included in the 2005 Capital Budget and Business Plan for this project. The total budget is \$500,000 which is funded equally by Transport Canada and the Region.

The estimated budget breakdown is shown in Table 1.

Table 1
Cost Breakdown

Project Phase	Estimated Cost
Define the system requirements for implementation of adaptive signal control	21,500
System architecture encompassing all of the requirements identified	19,700
Procurement and procurement management	183,400
System and software design	17,200
Software development	131,900
Traffic control parameters and test plans	11,700
Integration and testing	43,100
Operations, evaluations and maintenance	37,000
Interim, draft and final reports	34,500
Total	\$500,000

Funding Sources	Estimated Funding
Transport Canada	250,000
York Region	230,000
Delcan Corporation Consulting (in-kind)	20,000
Total	\$500,000

6. LOCAL MUNICIPAL IMPACT

The proposed technology enables the Region to implement traffic signal control operations that continuously adapt to fluctuations in traffic volumes. As a result, the Region can be more effective and efficient in response to changing traffic patterns along the Regional road network. This will also assist in reducing delays and congestion on local roads intersecting with Regional roads.

7. CONCLUSION

To encourage the development of ITS initiatives throughout Canada, the Federal government initiated a program through Transport Canada to provide funding to public/private sector alliances.

Region staff worked with Delcan Corporation to develop an adaptive traffic control system for urban congestion management in support of the Region's CTCS. The ease of usage further enhances the quality and timely correction of traffic control signal concerns.

It is proposed that the Commissioner of Transportation and Works be authorized to execute agreements with Transport Canada and Delcan Corporation. These agreements will allow for the funding, development and integration of an adaptive traffic control system. This project will support the Region's CTCS, as outlined in this report. The requirements of the Purchasing By-law should be waived, and this project be assigned to Delcan Corporation.

The Senior Management Group has reviewed this report.