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**Item No. 14.1.4**
**Halifax Regional Council**
**July 19, 2016**

Mayor Savage and Members of Halifax Regional Council

**SUBMITTED BY:** Original Signed by

John Traves, Q.C. Acting Chief Administrative Officer

Original Signed by

Jane Fraser, Acting Deputy Chief Administrative Officer

**DATE:** June 22, 2016

**SUBJECT:** **Sole Source Award – Regional Household Travel Survey**

## ORIGIN

Planning & Development deliverables for 2015 include PD 5.35: "Measures will be taken to strengthen the regional transportation demand model (VISUM) through the undertaking of a travel demand survey and installation of on-street traffic data collection devices. This work will be done in partnership with Dalhousie University (DalTRAC)". The approved 2016-17 Planning & Development operating budget includes funding to undertake this work.

## LEGISLATIVE AUTHORITY

Under the HRM Charter, Section 79, Regional Council may expend money for municipal purposes. Administrative Order #35 (Procurement Policy) requires Regional Council to approve the awards of contract for sole source purchases exceeding $50,000. This report conforms to the above Policy and Charter.

Administrative Order 35, subsection 8 (11) (k), indicates that a sole source approach can be used to procure services from a public agency.

## RECOMMENDATION

It is recommended that Halifax Regional Council, in accordance with the Sole Source Policy (Administrative Order 35, Section 8(11A), subsections ((k) attached), award the sole source undertaking of a Regional Household Travel Survey to the Dalhousie Transportation Collaboratory (DalTRAC) at a cost of $312,552 (including net HST) with funding from cost centre R951 (Order MPLAN005) as outlined in the Financial Implications section of this report.

## BACKGROUND

At its January 28, 2014 meeting, Halifax Regional Council recommended approval of "the attached MOU between HRM, Metro Universities and the NSCC and endorse the Mayor signing the MOU on Council's behalf and direct implementation of its initiatives to begin." The MOU included building on an MOU adopted in 2005 which recommended the pursuit of collaborative opportunities including:

- participation in development of a Cultural Policy for HRM
- collaboration on an Immigration Action Plan/Strategy
- support to HRM on recreation policy and programming
- improved transportation connections
- community policing
- strategic planning
- shared use of facilities

In 2011, HRM began using a new regional roadway network model called VISUM. Since that time, significant effort has gone into building and calibrating the model. It has been applied as a critical analysis tool in a number of important studies including the Regional Plan Update (RP+5), the Moving Forward Together Plan, the Commuter Rail Feasibility Study and the Bedford-Mainland North Corridor Study. The model is only truly effective and defensible when it is calibrated to detailed and up-to-date travel data. This data is normally collected through regional household travel surveys such as the one described in this report.

## DISCUSSION

A Regional Household Travel Survey is a perfect opportunity for the Municipality to establish the type of strategic planning collaborative partnership described in the MOU identified in the Background section above.

Travel surveys are critical for cities to develop network models, provide knowledge for evidence-based decision making, monitor the performance of the roadway and transit networks, and track progress in sustainable travel behaviour. The information will be useful in helping Halifax Transit develop more sophisticated ridership projections, and it will also provide good background data to help the Municipality strategically increase modal split of sustainable forms of transportation and monitor progress. Accurate demand modeling is a critical tool in evaluating project cost-effectiveness and in setting Capital Cost Contribution charges. While most major cities in Canada undertake travel surveys regularly, one has not been undertaken in the Halifax Area since the mid-1980's. Furthermore, most cities in Canada that do undertake surveys of this nature do so in partnership with local universities.

The Dalhousie Transportation Collaboratory (DalTRAC) is uniquely positioned and motivated to undertaken this work. Dr. Ahsan Habib, an Associate Professor in the School of Planning and Department of Civil and Resource Engineering at Dalhousie leads the project. In his time at the University of Toronto, Dr. Habib was a key player in the implementation of the Greater Toronto Area's Transportation Tomorrow Survey, a comprehensive travel survey conducted every five years since 1986. Dalhousie University possesses the high-capacity computer servers and workstations necessary to ensure secure data collection. In addition to generating important information for the Municipality, the survey will provide data that will feed into important research being undertaken by the University. In recognition of this, DalTRAC proposes to contribute in-kind staff time and computing resources over and above the project budget. The added value of this supporting academic research is something that could not be provided by a private sector firm.

The survey proposed will provide detailed household-level travel activity information to develop multiple components of the transportation network modelling systems, including trip generation, trip distribution, mode choices (automobile, transit, active transportation, etc) and destination choices. The survey will use

a multi-instrument data collection approach, including customized computer-assisted web interviews and telephone interviews. A random sample of 10,000 households across Halifax will be invited to participate in the survey with an objective of the completed responses representing a 2.5% sample of the region.

Normally, surveys of this nature are undertaken every five years. It is our intention to do the same with this survey, although the award proposed by this report deals only with the initial survey that will be undertaken in Fall 2016.

## FINANCIAL IMPLICATIONS

The cost of the Sole Source Agreement with the Dalhousie Transportation Collaboratory (DalTRAC) is $299,707 plus net HST of $12,845 for a total cost of $312,552. The cost of this agreement can be accommodated within cost centre R951, Strategic Transportation Planning, Planning & Development (Order MPLAN005). This project was previously approved for funding from the Strategic Studies Reserve, Q330, and has an available balance of $375,541. Budget has been confirmed by Finance.

| Budget Summary, MPLAN005 (Funded from Q330) | |
|---|---|
| 2015/16 approved amount | $655,100 |
| 2015/16 amount returned to reserve | ($223,100) |
| Available | $432,000 |
| This award per recommendation | ($312,552) |
| Balance of MPLAN0005 following award | $119,448 |

**Strategic Studies Reserve, Q330, (June 2, 2015)**
Reserve is intended to provide funding to support organizational research for policy direction and long-term municipal planning. Studies' deliverables will provide evidence-based research to direct staff to write policy which will redefine business needs for a regional impact. Annual funding to the reserve is an allocation from fiscal services. The approval of the recommendation does not have a negative impact on the anticipated reserve balances as this amount was already approved as a withdrawal in the 2015/16 and 2016/17 reserve budget, so there is no further impact to the reserve

## RISK CONSIDERATION

With all agreements of this nature, there is risk that the project may be delayed or not completed at all. This will be managed by developing a strong project terms of reference and appointing an internal project manager with sufficient resources to carefully track project progress.

There is also risk in not proceeding with a Regional Household Travel Survey. The Integrated Mobility Plan and other strategic investment and planning decisions are based on a well-founded knowledge of what the mobility demands in the region are. Without this knowledge, future decisions may not properly address the true needs of the Region and investments may not have optimal value.

## COMMUNITY ENGAGEMENT

No community engagement is planned beyond the engagement achieved through the survey.

## ENVIRONMENTAL IMPLICATIONS

There are no environmental implications to undertaking the travel survey. Data generated by the survey is expected to be beneficial in the evaluation of environmental implications due to transportation.

## ALTERNATIVES

Regional Council may choose to forego undertaking a Regional Household Travel Survey or to have it done through a means other than the sole source award to DalTRAC. This is not recommended, as the value of added-value research and an opportunity to develop a strategic planning collaboration as outline in the MOU between HRM, Metro Universities and the NSCC would be lost.

## ATTACHMENTS

Attachment A: Procurement Policy Section 8(11)A
Attachment B: DalTRAC Proposal for Partnership: Household Travel Activity Survey
Attachment C: Proposed Project Budget

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A copy of this report can be obtained online at http://www.halifax.ca/commcoun/index.php then choose the appropriate Community Council and meeting date, or by contacting the Office of the Municipal Clerk at 902.490.4210, or Fax 902.490.4208.

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Procurement Approval by: Original Signed
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**Attachment A**
**Administrative Order 35**
**Procurement Policy Section 8 (11) (A)**
**Sole Source/Single Source Purchases**

(11) **Alternative Procurement Practices** may be used as follows:

A. Sole Source/Single Source Purchases. These occur:
(a) To ensure compatibility with existing products, to recognize exclusive rights, such as exclusive licences, copyright and patent rights, or to maintain specialized products that must be maintained by the manufacturer or its representative.
(b) Where there is an absence of competition for technical reasons and the goods or services can be supplied only by a particular supplier and no alternative or substitute exists.
(c) For the procurement of goods or services the supply of which is controlled by a supplier that is a statutory monopoly.
(d) For the purchase of goods on a commodity market.
(e) For work to be performed on or about a leased building or portions thereof that may be performed only by the lessor.
(f) For work to be performed on property by a contractor according to provisions of a warranty or guarantee held in respect of the property or the original work.
(g) For the procurement of a prototype of a first good or service to be developed in the course of and for a particular contract for research, experiment, study or original development, but not for any subsequent purchases.
(h) For the purchase of goods under exceptionally advantageous circumstances such as bankruptcy or receivership
(i) For the procurement of original works of art.
(j) For the procurement of goods intended for resale to the public.
(k) For the procurement from a public body or a not-for-profit corporation.
(l) For the procurement of goods or services for the purpose of evaluating or piloting new or innovative technology with demonstrated environmental, economic or social benefits when compared to conventional technology, but not for any subsequent purchases.

The terms and conditions of a sole source/single source purchase shall be negotiated. Sole source/single source purchases over $25,000 and not exceeding $50,000 shall be approved by the CAO.

ATTACHMENT B

# Project Title:
# Household Travel Activity Survey for Halifax

# Proposal for Partnership

## Halifax Regional Municipality


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Submitted By:


Principal Investigator: **Dr. Ahsan Habib**

## Dalhousie Transportation Collaboratory

Associate Professor, School of Planning, and
Department of Civil and Resource engineering (cross)
Dalhousie University, Sexton House, Room E205
5410 Spring Garden Road, B3H 4R2, Halifax, NS, Canada


October 2015

## 1. INFORMATION OF THE ORGANIZATION

| | | | |
|---|---|---|---|
| **Organisation Name:** | Dalhousie University (Dalhousie Transportation Collaboratory, DalTRAC) | | |
| **Contact Person & Title:** | *Principal Investigator*: Dr. Ahsan Habib, Associate Professor, School of Planning and Department of Civil and Resource Engineering (cross) | | |
| **Address:**<br>5410 Spring Garden Road, P.O. Box 15000,<br>Dalhousie University, Halifax, NS, B3H4R2 | | **Phone:** | 902-494-3209 |
| | | **Fax:** | 902-423-6672 |
| | | **E-mail:** | ahsan.habib@dal.ca |
| **Dalhousie University Contract Signing Authority**<br>Dr. Martha Crago<br>Vice President of Research | | Contact information for the contribution agreement available upon request | |

## 2. PROJECT DESCRIPTION

### 2.1 Background

Travel surveys are critical for cities to track progress in sustainable travel behaviour and develop transport network models. Travel activity data is a pre-requisite for developing and monitoring performance measures in mobility choices as identified in the 2014 Halifax Regional Municipality Planning Strategy (RP+5). Individuals' travel information (including origin and destination) is required to develop travel demand forecasting models that generate key transportation indicators for the assessment of transport investment decisions and impact on communities. Travel surveys and models have become essential policy analysis and decision-support tools for regional and local transportation planning in many cities across Canada. Particularly, technological advancements and visualization techniques have provided tremendous opportunities for the use of transport information in evidence-based policy and decision-making. Many capital regions in Canada conduct travel surveys on a regular basis, and use travel demand forecasting models for plan-making and evaluation. For instance, Toronto, in partnership with the University of Toronto is collecting travel behaviour information on a five year interval through the Transportation Tomorrow Survey (TTS) since 1986. Different agencies in Toronto also actively develop, maintain and improve the transportation network models with the TTS data. The City of Hamilton (population 519,949), a comparable city to Halifax also participates in the TTS data collection program for the last 30 years.

The United States (US) is leading in many ways in data collection, analysis and the use of models as decision-making tools. Oregon (OR) and Portland has demonstrated many innovative initiatives in the field of activity-based travel behaviour data collection, visualization and modelling to assist transportation decision-making processes. Recent legislative requirements by the Environmental Protection Agency (EPA) further necessitate coordinated and structured

data collection, transport network, and impact modelling (such as emission models), even for smaller communities in the US.

Despite many significant steps that the Halifax Regional Municipality (Halifax) has taken in recent years in order to promote sustainable transportation initiatives, there is a significant gap in travel data collection, visualization and analysis in this region. Dalhousie University Transportation Collaboratory (DalTRAC), a CFI -sponsored transportation research facility has initiated a comprehensive approach to fill the gap. The laboratory has procured essential data collection infrastructure with the funding support of the Canada Foundation for Innovation (CFI) and Nova Scotia Research Innovation Trust ($195,143), Halifax Regional Municipality ($25,063) and Dalhousie University (space+$10,000). In partnership with the Province of Nova Scotia, DalTRAC has been working to develop a travel survey program since March 2015.

This application seeks partnership and funding support from the Halifax Regional Municipality to broaden the scope of the survey, and create opportunities for Halifax to realize a household travel survey for benchmarking travel behaviour and transportation network modelling. This initiative could take the advantage of the physical infrastructure and research expertise at DalTRAC. More importantly, this initiative will offer a consistent survey methodology and data, which will be useful for transport professionals at both the municipal and provincial levels. This approach essentially will add to the long-term value of the data, survey, infrastructure and capacity building in this region for travel behaviour data collection and modelling. Finally, this survey will also support a larger NSERC-sponsored DalTRAC research program that aims to develop a bottom-up integrated land use, transport, and energy modelling system for Halifax. The Principal Investigator began planning for this survey in 2012. The DalTRAC infrastructure project strategically procured relevant infrastructure, and conducted multiple small-scale surveys, including a Halifax Mobility and Travel Survey (HMTS) in 2013. The current survey project aims to expand the scope and extent of the travel survey that includes collection of information regarding origin and destination for a 24-hour period (work and non-work trips) in the Halifax Regional Municipality.

## 2.2 Purpose of the Travel Survey

The purpose of this specific survey is to collect information on individuals' travel choices (i.e. where they go, how they get there, and what they do there). The survey will provide detailed household-level travel activity information to develop multiple components of the transportation network modeling system, including trip generation, trip distribution, mode choices, and destination choices. Moreover, it will offer an opportunity to track progress in transport sustainability and evaluate future transportation needs in HRM (as well as in the Province of Nova Scotia). The Nova Scotia Travel Activity (NovaTRAC) survey will be the largest and most comprehensive travel survey ever conducted in this region.

## 2.3 Technical Objectives

The specific objectives of this project include:

- Development and design of a travel survey questionnaire based on the best practices, relevance to Halifax and pilot testing
- Obtain permission from the Research Ethics board to conduct the survey as this study involves human information
- Development of a customized, innovative web survey tool (CAWI) that can reduce the cost of the survey
- Deployment of a Computer-Assisted Telephone Interviewing (CATI) system for telephone travel data retrieval
- Set up server-client system in DalTRAC for secured data collection, processing and analysis using two high-capacity computer servers, nine work-stations and relevant equipment
- Pilot testing of the survey tools and capacity building within the DalTRAC team
- Development of survey materials, communication plans (e.g. invitation, social media, video) and mailing plan
- Development of sample design, sample procurement and sample management protocols
- Training of surveyors and associated personnel to administer the survey
- Administration of the survey, including Computer-Assisted Web Interviewing (CAWI) and Computer-Assisted Telephone Interviewing (CATI)
- Development of a database, including data coding, geocoding, data cleaning and processing
- Pos-survey processing, including sample expansion and weighting (if required)
- Data analysis, preparation of summary statistics and visualization of the survey findings
- Documentation of the survey and preparation of survey reports

Deliverables of this project includes: survey reports and database for Halifax. The principal Investigator will be able to present the survey findings upon request. The survey will be designed and administered in close communication with HRM staff. In-kind support from the municipal staffs at different stages will be highly appreciated.

# 3. METHODOLOGY

**STEP ONE: PLANNING AND SURVEY DESIGN**

## 3.1 Review of Travel Surveys

This project will first gather information on all recent, best practice surveys, and determine which type of the survey will better suit the need of Halifax and the Nova Scotia. Candidate methodology includes: trip-based survey (e.g TTS), travel activity diary (e.g. Chicago) and activity-based survey (e.g. Edmonton).

## 3.2 Survey Questionnaire Design

The Principal Investigator will design a survey questionnaire based on lessons learned from earlier Halifax surveys, best practices and his expertise. The survey questionnaire will be widely tested by DalTRAC staff/students, practicing planners and engineers, private citizens and fellow faculty members.

## 3.3 Survey Instruments

The Nova Scotia Travel Activity Survey (NovaTRAC) will utilize a multi-instrument data collection approach, a customized CAWI survey tool and a CATI system. A random sample of households across Halifax (and a separate sample of the rest of Nova Scotia) will be invited to participate in the survey. The households will be mailed a survey invitation package including information about the study, frequently asked questions, details of what participation entails and its benefits, a sample page from the 24-hour travel log, instructions for moving forward with the survey, and a link to an online survey. The NovaTRAC survey will follow the best practice survey protocols in the transport survey industry, including Chicago's Travel Tracker Survey and Toronto's Transportation Tomorrow Survey as best as possible.

## 3.4 Sample design

The Halifax survey will invite 10,000 households, approximately a 5% random sample drawn from the Halifax area. This project will try to achieve at least 2.5% completed response. Halifax's total household is 165,155, with a total population of 384,540 and household size of 2.3 (Census, 2011). Potentially, the survey could generate trip records of 11,500 individuals. The sample frame for the survey consists of listed residential phone numbers within the boundaries of the survey area defined by Forward Sorting Area (FSA). Below is a list of postal codes considered for the survey:

Table 1: Forward sortation Areas (FSAs)

| | | | | |
|---|---|---|---|---|
| B0J | B2R | B2S | B2T | B2V |
| B2W | B2X | B2Y | B2Z | B3A |
| B3B | B3E | B3G | B3H | B3J |
| B3K | B3L | B3M | B3N | B3P |
| B3R | B3S | B3T | B3V | B3Z |
| B4A | B4B | B4C | B4E | B4G |

Table 2: Delivery Areas

| | |
|---|---|
| B0J Halifax, NS DCF | B2R Waverley, NS STN MAIN |
| B2S Lantz, NS STN MAIN | B2T Enfield, NS STN MAIN |
| B2V Dartmouth, NS STN EAST | B2W Dartmouth, NS STN EAST |
| B2X Dartmouth, NS STN EAST | B2Y Dartmouth, NS STN MAIN |

| | |
|---|---|
| B2Z Dartmouth, NS STN EAST | B3A Dartmouth, NS STN MAIN |
| B3B Dartmouth, NS STN MAIN | B3E Porters Lake, NS STN MAIN |
| B3G Dartmouth, NS STN MAIN | B3H Halifax, NS LCD 2 |
| B3J Halifax, NS LCD 2 | B3K Halifax, NS LCD 2 |
| B3L Halifax, NS LCD 2 | B3M Halifax, NS LCD 1 |
| B3N Halifax, NS LCD 1 | B3P Halifax, NS LCD 1 |
| B3R Halifax, NS LCD 1 | B3S Halifax, NS LCD 1 |
| B3T Lakeside, NS STN MAIN | B3V Halifax, NS LCD 1 |
| B3Z Tantallon, NS STN MAIN | B4A Dartmouth, NS STN BEDFORD |
| B4B Dartmouth, NS STN BEDFORD | B4C Dartmouth, NS LCD LOWER SACKVILLE |
| B4E Dartmouth, NS LCD LOWER SACKVILLE | B4G Dartmouth, NS LCD LOWER SACKVILLE |

The principal investigator will conduct the sampling process, and ensure that the process is consistent with other larger-scale surveys conducted in Canada. The sample list will be procured from a third-party vendor that maintains monthly active households in the region. Candidate vendors include: Cornerstone Group of Companies and Info-Canada. The sample information that will be obtained from the commercial vendor includes: name, full street address, postal code, phone number, and dwelling type (single or multi-unit). The mailing of letters and survey interviewing will be selectively terminated as the target will be reached for sub-regional areas.

**STEP TWO: SOFTWARE DEVELOPMENT AND EQUIPMENT**

## 3.5 Data collection site set-up

DalTRAC develops a network set-up with at least nine interview workstations and two computer servers. It will procure additional equipments such as headset, skype business account and laptops/tablets. The laboratory will build in the client-server system for the CATI and CAWI system, which was obtained through CFI infrastructure project (see figure 1).

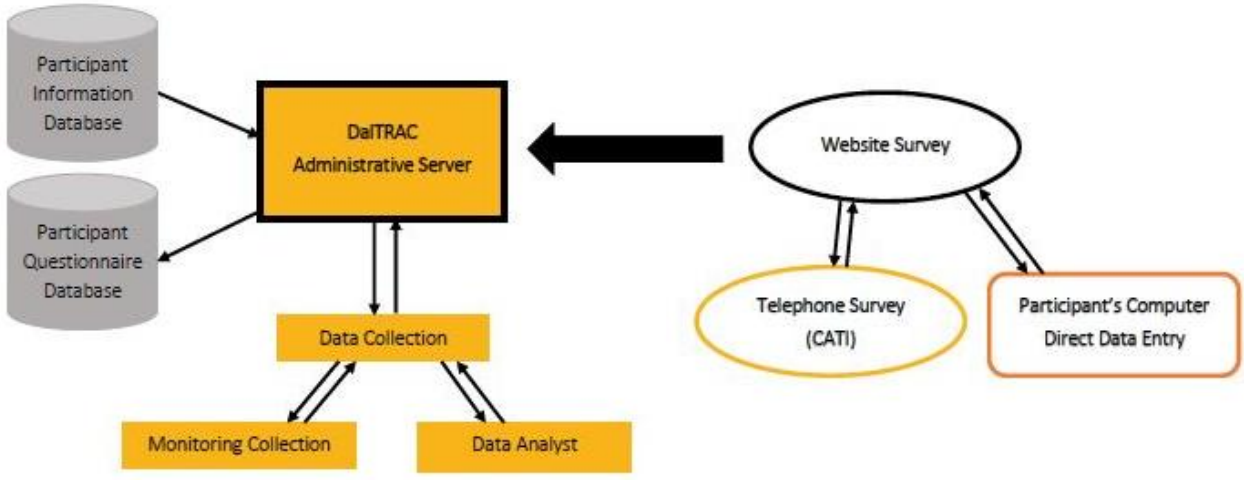


Figure1: DalTRAC lab data collection set-up

## 3.6 Customized tool development

A new customized in-house CAWI system seems necessary to reduce the cost, increase the accuracy of geo-location data and enhance user experience for survey completion. This new tool will be developed using multiple web-programming languages and Google API. The tool can also bring capability to complete the survey using smartphone or tablets (see figure 2).

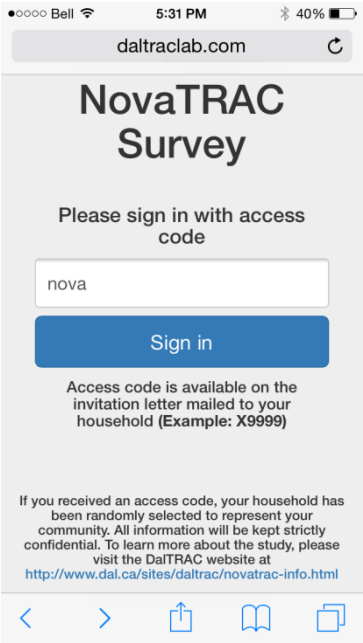


Figure1: DalTRAC customized tool screenshot (iphone accessed)

**STEP THREE: COMMUNICATION PLAN, PRINTING & MAILING**

## 3.7 Communication planning

The team will invest an extensive amount of time to develop survey materials and a communication plan in order to increase response rate. All materials are required to submit in the Dalhousie University Research Ethics Board for prior approval. Necessary revisions will be conducted as per the guidance of ethics experts in the board. Since it is a pre-process of going forward with the survey, DalTRAC has already produced several materials (see Appendix: Survey Materials), including consent form (A1), survey questionnaire (A2), telephone survey script (A3) and information letter (B1), brochure (B2) and web survey tool (B3). These materials are also required by the commercial vendor to pre-approve the rental of the personal information necessary for the survey.

Furthermore, DalTRAC is planning to use both traditional and social media to promote the survey and increase the response rate. We are expecting the local media also be interested to hear about the project from the Principal Investigator as the plan for the NovaTRAC was featured in late 2013 (at Halifax MetroNews article).

**STEP FOUR: CONDUCT OF THE SURVEY**

## 3.8 Training of students and staffs

PI/DalTRAC team will be involved in the training of staff, students, interviewers and volunteers to conduct the first ever random, large-scale travel survey in Halifax. It will also develop a process of resource allocation, staffing, timing and monitoring progress of the team.

## 3.9 Telephone interview

DalTRAC expects that the custom web-tool developed for this project will be successful in terms of higher web survey-retrieval, which in turn will reduce the cost of CATI-based telephone interviews. However, it must prepare itself for telephone interviews to certain extent. The team will set-up a process of telephone interview and quality control. The telephone survey script is added in this proposal (see A3 in Appendix: Survey Materials).

**STEP FIVE: BUILDING DATABASE**

## 3.10 Monitoring and analysis during the survey

Continuous monitoring and analysis will be required during the survey to ensure target response rate and the overall success of the survey. Multiple types of analysis will be conducted to guide the survey process, including sample characteristics and completion rates.

## 3.11 Database building

The database building will involve several stages: zonal systems, travel activity coding, geocoding, processing, cleaning, survey expansion and summary statistics. For instance, zonal systems require careful consideration for various spatial aspects, including modification of Traffic Analysis Zones (TAZ), and adjusting multiple types of zonal boundaries (FSA, postal code, census block, DA, CT, CMA, CSD). DalTRAC will utilize its expertise and capacity already built in the last three years to develop the database for multiple types of analysis and modelling use. Some part of the analysis might be conducted within EMME or VISUM platform, depending on the resource availability and funding support. At the end, a common platform (MSAccess) will be used for the delivery of the database to Halifax staff for use in transport planning and decision-making.

**STEP SIX: ANALYSIS AND REPORT PREPARATION**

## 3.12 Summary analysis

DalTRAC team will conduct summary analysis for the purpose of reporting. Summary statistics will include: modal split by purpose of activity, average distance travelled, home to work travel time and distance, trip rate by population groups, etc.

## 3.13 Report preparation and deliverables

The project will deliver a report detailing the process of the survey and summary statistics for the Halifax Regional Municipality. Deliverable to HRM also includes a database of the travel survey (non-identifiable as per ethics requirement). All detailed information can be accessed by HRM-approved city officials in the DalTRAC laboratory upon request and prior ethics agreement. DalTRAC will keep working on the database for the modelling purposes, and update the database for analysis and modelling purposes.

# 4. PROJECT TEAM

## 4.1 Principal Investigator

Dr. Ahsan Habib is the Principal Investigator for this project, and is responsible for project management and supervision. He is a transportation engineer and urban planner with extensive expertise in travel survey methods, travel demand forecasting, integrated transport-land use-energy-emission modelling and microsimulation of urban systems. He received his PhD in civil engineering from the University of Toronto, and held a professional position at the Ministry of Transportation, Ontario (MTO). He is the founder of Dalhousie Transportation Collaboratory (DalTRAC), a multi-purpose facility for advancing transportation research in the Atlantic region.

## 4.2 Core Members for the Survey

- Sara Campbell (Bachelor of Community Design): She will serve as a Project Coordinator of the Survey project. Her responsibility includes report writing and day-to-day operation of the survey
- Babatope Olajide (BSc, MEng, Process Engineering), MASc/PhD Student (Civil Engineering): He will serve as the system administrator and the computer programmer for the project
- Dylan Smith (BSc, Geography), Master of Planning Student (Planning): He will be responsible for CATI surveys
- Nazmul Arefin (BSc, Civil Engineering), PhD Student (Civil Engineering): He will serve as the Data Analyst for the project
- Mahmudur Fatmi (BSc, Civil Engineering), PhD Student (Civil Engineering): He will offer support for data processing, analysis and report writing (as necessary)

- Jahed Alam (BSc, Civil Engineering), MASc Student (Civil Engineering): He will serve as a analyst for modelling requirements and data processing
- Shaila Jamal (BURP), Master of Planning Studies Student (Planning): She will assist in survey invitation, mailing and communication
- Farhana Ferdous (BURP, Masters in Geography), Planner: She will be responsible for management assistance, staffing, resource allocation and record keeping

## 4.3 Support staff/student/surveyors

- Hesam Hafezi (BSc, MASc, Civil Engineering), PhD Student (Civil Engineering)
- Shamsad Irin (BSc, Civil Engineering), MASc Student (Civil Engineering)
- Spencer Matheson (BSc, Mathematics), Master of Planning candidate
- Mahbub Rahman (BSc, Civil Engineering), MASc Student (Civil Engineering)
- Naznin Sultana Daisy (BURP, MURP, Urban and Regional Planning), PhD Student (Civil Engineering)
- Undergraduate students/surveyors: Scott Borden, Alexander Leung and Kyle Whynot

Additional staff/students/surveyor will be hired based on the need of the approved project as necessary.

# 5. BENEFITS TO HALIFAX

### 5.1 Filling the gap in travel data and models

Travel data collection and modelling have become common practices in many jurisdictions across North America as a means to better understand the gaps in transport investments and policy development. Unfortunately, Halifax is one of the capital regions that do not have a regular travel survey data collection program. This partnership project will help in alleviating the gaps that exist in Nova Scotia's transport data, network flows and emission information.

### 5.2 Use of local information in policy-making

The data and indicators developed in this project will be beneficial for sustainable transportation planning and policy-making. Many agencies, professionals and advocacy groups in the region univocally conclude on the limited availability of information about travel patterns during policy debates and public consultation. The work proposed in this proposal will directly help to generate local information for developing policies and strategies related to traffic, active transportation, modal shifts and behavioural changes towards sustainable transportation.

### 5.3 Building the University-Government transportation nexus

This proposed project will contribute to the continuation of building the University-Government transportation nexus necessary to align the research goals and the needs of Halifax. Many regions in Canada and the US have partnered with universities in order to administer transport

data collection and modelling initiatives. The City of Toronto and the Ministry of Transportation Ontario have a very successful example of such collaborative activity though the Data Management Group (DMG) in the University of Toronto, which has managed the Transportation Tomorrow Survey (TTS) program and supported Ontario agencies for over twenty years. Similar arrangement exists in the Province of Quebec with the École Polytechnique de Montréal. Transportation data collection, reporting, analysis and visualization can be complex, which requires dedicated infrastructure, and this process could evolve over time. From the DMG experiences in Toronto, it is evident that since DMG is not a planning agency with on-going operational planning responsibilities, it can allocate some of its resources to on-going development activities (such as base networks, new data management systems, open source data etc.), thereby advancing the region's technical capabilities in these areas over time. DalTRAC has taken a similar approach, which will directly benefit Halifax with the continuous improvement in data management systems, model improvements, and making data resources available to agencies and the public. It is expected that the Halifax, similar to the Province of Nova Scotia will partner with the DalTRAC to build an effective University-Government transportation nexus for promoting travel data collection, modelling and evidence-based transportation planning in our city and region.

## 6. SURVEY MATERIALS

**See attached PDF**

*A1. Consent Form*

*A2. Survey Questionnaire*

*A3. Telephone Survey Script*

*B1. Information Letter and Travel Log*

*B2. Brochure*

*B3. Web Survey Tool*

## 7. PROPOSED BUDGET AND TIMELINE

**See attached PDF**

ATTACHMENT C

# Proposed Budget and Timeline

Dalhousie University Transportation Caoolaboratory (DalTRAC)

| | Task | Details | Timeline | Responsibility/Vendor | Estimated Hours Principal Investigator | Estimated Hours Staff/ Students | Estimated costs ($) Principal Investigator | Estimated costs ($) Staff/ Students | External/ Vendor cost | Total cost |
|---|---|---|---|---|---|---|---|---|---|---|
| **Step 1: Planning & Survey Design** | | | | | | | | | | |
| Review of Travel Surveys & Literature Review | Review of literature and major surveys (e.g. TTS, Chicago, Edmonton, Portland surveys) | Gather information on recent travel surveys, learn best practices, and determine which type of survey works best for Halifax | 3 months | PI & DalTRAC staff/team | 14 | 30 | 2100 | 600 | 0 | $2,700.00 |
| Survey Questionnaire Design & Pilot testing | Create and test survey questionnaire | Design the survey questionnaire, distribute among planners/engineers for testing | 1 month | PI & DalTRAC staff/team (in-kind contribution from the practicing planners, academics and others) | 35 | 70 | 5250 | 1400 | 0 | $6,650.00 |
| Design of Survey Instruments | Develop and test instruments | Multi-instrument data collection methods (e.g. CATI/CAWI/Scripts, etc) | 3 months | PI & DalTRAC staff/team | 20 | 70 | 3000 | 1400 | 0 | $4,400.00 |
| Sample Design | Sampling strategy, methods and associated design | Invite 5% sample, 10,000 household; target completion 2.5%, 5000 HH | 1 month | PI | 14 | | 2100 | 0 | 0 | $2,100.00 |
| Sample Purchase | Obtain sample from commercial vendor (priority: best sample) | Purchasing household sample list with full address and phone number | 7-10 business days | PI/Cornerstone Group of Companies or, InfoCanada | 1 | | 150 | 0 | 4853 | $5,003.00 |
| Planning and organization | Survey planning, ethics application, and other relevant survey planning | Planning of all aspects of the survey and Dalhousie University Ethics Approval | 4 months | PI & DalTRAC staff/team | 70 | 35 | 10500 | 700 | 0 | $11,200.00 |
| *Subtotal, Step 1* | | | | | 154 | 205 | 23100 | 4100 | 4853 | $32,053.00 |
| **Step 2: Software Development & Equipment** | | | | | | | | | | |
| Data Collection Site Setup | DalTRAC lab set-up for data collection, processing and archival | Computer network and associated tasks | 2 months | Dalhousie University IT/PI & DalTRAC staff/team | 14 | 35 | 2100 | 700 | 4500 | $7,300.00 |
| Survey Systems for data collection | Procurement of Survey Systems (CATI/CAWI/PDA system) | NO cost for HRM | 1 month | **CFI in kind ($6.461)**/ Creative Research Systems | | | 0 | 0 | 0 | $0.00 |
| CATI/CAWI set-up and survey coding | CFI-funded Survey System (e.g. Creative Research Systems) set-up | Preparing and coding of the CATI/CAWI software | 1 months | PI/DalTRAC staff/team | 7 | 70 | 1050 | 1400 | 0 | $2,450.00 |
| Customized, in-house CAWI Tool Development & testing | DalTRAC CAWI tool and web-app. development | New DalTRAC tool development using multiple web programming language and Google API | 4 months | PI/DalTRAC staff/team | 14 | 250 | 2100 | 5000 | 0 | $7,100.00 |
| Computer Work Stations procurement | Procurement of nine computer interview stations | NO cost for HRM | 1 month | **CFI in kind ($18,164)**/Dell | | | 0 | 0 | 0 | $0.00 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Laptop computers/tablets/hardware procurement | Procurement of laptop/tablet for survey administration and analysis | 4 laptops, 2 tablets and other hardware (as necessary) | 1 month | PI: ASUS/Dell/Apple | | | 0 | 0 | 9692 | $9,692.00 |
| Computer Server Procurement | Procurement of Two high-performance computer servers | NO cost for HRM | 1 month | **CFI in kind ($15715)**/Dell | | | 0 | 0 | 0 | $0.00 |
| Headsets procurement | Interview station wiring for Telephone Surveying | 10 headsets and adapters - wiring and set-up | 1 month | PI/Headsets.ca | | | 0 | 0 | 1639 | $1,638.73 |
| *Subtotal, Step 2* | | | | | 35 | 355 | 5250 | 7100 | 15831 | $28,180.73 |
| **Step 3: Printing, Mailing & Communication** | | | | | | | | | | |
| Printing | Envelopes | Printing envelopes with addresses (variable printing) in colour | Approx. 2 weeks (multiple phases) | Dalhousie Print Centre | | 21 | 0 | 420 | 2012 | $2,432.15 |
| Printing | Mail Out Package | Printing 7 pages (2 d.s. and 5 s.s) with 10,000 copies of each in colour | Approx. 2 weeks (multiple phases) | Dalhousie Print Centre | | 35 | 0 | 700 | 8633 | $9,332.60 |
| Printing | Folding and Inserting into Envelopes | Folding 70,000 pages by machine. Insert page order individually (1 behind the other). Insert into envelope and seal | Approx. 2 weeks (multiple phases) | Dalhousie Print Centre | | 35 | 0 | 700 | 10567 | $11,267.40 |
| Mailing | Mailing 10,000 envelopes | Canada post mailing (@1.20/mail) | Approx. 1 week (multiple phases) | Dalhousie Mail Room | | 35 | 0 | 700 | 12000 | $12,700.00 |
| Social media | Social Media promotion and advertisement | Video, Twitter, Facebook | 8 months | PLANifax / DalTRAC Team | 7 | 35 | 1050 | 700 | 2000 | $3,750.00 |
| Print media | Traditional Media (Newspaper) ad | 1/8 page, in colour, $249.00/day | 5 days (8 months) | Metro Halifax | 1 | 7 | 150 | 140 | 1245 | $1,535.00 |
| Print media | Traditional Media (Newspaper) ad | 1/4 b/w, colour, $1,915.92 single weekday. | 5 days (8 months) | Chronicle Herald | 1 | 7 | 150 | 140 | 9580 | $9,869.60 |
| Website | NovaTRAC website | Dedicated NovaTRAC page development, maintenace and updates | 8 months | DalTRAC Team | 14 | 35 | 2100 | 700 | 0 | $2,800.00 |
| *Subtotal, Step 3* | | | 1 month | | 23 | 210 | 3450 | 4200 | 46037 | $53,686.75 |
| **Step 4: Conduct of the Survey** | | | | | | | | | | |
| Skype phone line | Business Skype purchase | 12.50/per user/month (9+ accounts) | 4 months | Skype/DalTRAC staff | | | 0 | 0 | 1800 | $1,800.00 |
| Training of surveyors | Training student surveyors | CATI - telephone survey training (operational and ethical) | 2 weeks | PI/Staff | 21 | 7 | 3150 | 140 | 0 | $3,290.00 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Telephone Interview/CATI interview | Recruit Surveyors and conduct phone surveys for those who didn't complete CAWI (among 10,000 invitees) | Rate of $10.60/hour/surveyor; Estimated completion per survey = 25 minutes; Estimated hours = 5, 175hrs | 8 months | DalTRAC Staff/Team/new hire | | | 0 | 54855 | 0 | $54,855.00 |
| Incentives for participants | Purchase, draw and delivery of VISA gift cards | One $200 VISA Gift Card and ten $50 VISA gift cards = $700.00 | end of survey | Staff/VISA | | | 0 | 0 | 700 | $700.00 |
| *Subtotal, Step 4* | | | | | 21 | 7 | 3150 | 54995 | 2500 | $60,645.00 |
| **Step 5: Building the Database** | | | | | | | | | | |
| Mentoring and Analysis | Continuous analysis for response rate and coverage | Web response and call matching, sample targets, etc | 8 months | PI/DalTRAC staff/team | 14 | 35 | 2100 | 700 | 0 | $2,800.00 |
| Post-survey processing | Data processing and cleaning | Validation, weighting, expansion, cleaning etc. | 4 months | PI/DalTRAC staff/team | 35 | 500 | 5250 | 10000 | 0 | $15,250.00 |
| Database Building | Deliverable database building | MSAccess-based database building | 4 months | PI/DalTRAC staff/team | 35 | 550 | 5250 | 11000 | 0 | $16,250.00 |
| *Subtotal, Step 5* | | | | | 84 | 1085 | 12600 | 21700 | 0 | $34,300.00 |
| **Step 6: Analysis & Report Preparation** | | | | | | | | | | |
| Summary Analysis | Aggregate summary and analysis | Standard survey analysis | 4 months | PI/DalTRAC staff/team | 35 | 150 | 5250 | 3000 | | $8,250.00 |
| Report Preparation and Deliverables | Deliverable report preparation | Survey documentation and report writing | 4 months | PI/DalTRAC staff/team | 70 | 200 | 10500 | 4000 | 0 | $14,500.00 |
| **Project management and record keeping** | | | | | | | | | | |
| Management assistance and record keeping | Management, resource allocation, staffing, scheduling and record keeping for PI | A professional, experienced planner for managing, staffing and record keeping (@$50/hour) | 8 months | PI/Farhana | In-kind (Dr. Ahsan Habib) | 500 | 0 | 25000 | 0 | $25,000.00 |
| *Subtotal, Step 6 and management* | | | | | 105 | 850 | 15750 | 32000 | 0 | $47,750.00 |
| Other costs | Printing catridge, supplies, travel etc | | | | | | | | | $4,000.00 |
| Subtotal | | | | | | | | | | **$260,615.48** |
| University Overhead | | 15% Overhead | | Dalhousie University | | | | | 39092 | $39,092.32 |
| | | | | | 422 | 2712 | 63300 | 124095 | 108313 | **$299,707.80** |
| NOTES | % breakdown | | | | | plus 5175 hrs | 21.12% | 41.41% | 36.14% | 100.00% |
| | Rates | DalTRAC staff/Students ($20/hr), Management Asst. ($50/hr), PI Dr. Ahsan Habib (@150/hr)and Surveyors (@10.60/hr) and others as per their fee (if any) | | | | | | | | |
| | Payments | Multiple types: monthly salary; monthly stipend; bi-weekly RA payment as per Dalhousie University guidelines | | | | | | | | |
| | Scheduling/meetings | Weekly and daily team/individual meetings as required at different stages of the survey | | | | | | | | |