Collaborative public transportation feasibility study: Development of a database prototype

Abstract: The Ecology Action Centre (EAC) has recognized the need for a collaborative information-based transit service that would connect users and transportation providers in the Maritime Provinces. From this need, a multi-disciplinary research partnership between the EAC and Dalhousie University was developed. The research team developed a basic functioning prototype for a web-based transit service. Four main methodological thrusts define the transit database project: first, a review of transit database precedents; second, a usability study of potential database users (n=6); third, a feasibility study reaching of transit providers (n=10); and lastly, web-expert consultation. Additionally, a number of potential funding sources for this project were identified, including community and government grants, web-based advertising and cooperative membership fees. Moreover, the identification of an effective entity under which the *Go Maritimes* service will be operated (i.e. multi-stakeholder cooperative or private sector enterprise) has been a high priority. This research project has equipped the EAC with the tools it needs to plan, manage, and move forward with the *Go Maritimes* project.

About the Authors:
Jeremy Corbin: Marine Affairs Program, Dalhousie University, jeremy.corbin@dal.ca
Stephen Cushing: School for Resource and Environmental Studies, Dalhousie University, stephen.cushing@dal.ca
Chantal de Medeiros: Library and Information Studies, Dalhousie University, chantal.demedeiros@dal.ca
Brock McDougall: Public Administration, Dalhousie University, brock.mcdougall@dal.ca
Mary-Eleanor Walker: Business Administration, Dalhousie University, mfwalker@dal.ca
Dandan Xu: Library and Information Studies, Dalhousie University, dn776227@dal.ca

Introduction

The need for a well-organized system of public transportation and the benefits of such a system are well documented (Bhatta & Drennan, 2003; Canadian Urban Transit Association, 2005; Walter & Scholz, 2007; Groszko, 2010; Government of Nova Scotia, 2012). National and international evaluations of collaborative transportation planning serve as research precedents upon which to draw (Gómez, 2004; Taylor & Schweitzer, 2005; Cotfas, Croicu, & Cotfas, 2009). The efficiency and effectiveness of regional transportation systems vary from city to city and are dependent upon a number of factors, including: economics, mobility, politics, and geography (Albalate & Bel, 2010). Transportation in the Maritime Provinces is a case study that will be highlighted throughout this paper.

The Ecology Action Centre (EAC) has partnered with a multi-disciplinary team at Dalhousie University to explore the feasibility of an information-based collaborative transportation project, entitled *Go Maritimes*. The EAC, established in 1971, is a Halifax-based non-profit organization that has roots at Dalhousie University. A number of action committees — Transportation, Built Environment, Coastal and Water Issues, Energy, Food, Marine, Wilderness, and Climate Change — work together in support of the EAC's mission to contribute to building a healthier, more sustainable economy and environment in Nova Scotia (Ecology Action Centre, 2012).

In the Maritime Provinces there are more than 33 transportation providers offering long-distance motorcoach services, privately-operated shuttle van services, local municipatransit routes, Dial-a-Ride services, and Access-a-Bus services. There is significant variation between each individual provider's fare structure, operating style, vehicle size, physical accessibility, public presence and promotion, and level of government subsidies. As well, there is a noticeable absence of a government-organized system of regional transit in the Maritimes. Groszko (2010) describes the current system of regional transit in the Maritimes as uncoordinated and often unreliable. Some of the barriers to transit ridership from urban centres in the Maritimes include the geographic gaps in transit services, limited stops along routes, and frequency of service (Groszko, 2010).

The Internet has transformed the way transportation information is accessed by both users and providers. Increasingly, the Internet is becoming the first and sole means of information seeking (Transportation Research Board, 2006). To capitalize on the online presence of transit users and providers, the EAC (Groszko, 2010) identified an opportunity to coordinate an online information-based collaborative transit website. Groszko (2010) refers to this as a 'one-stop-shop' portal for transportation services.

This purpose of this paper is to first, highlight the research and collaboration between students and staff at Dalhousie University, web consultants, and the EAC; second, to outline the

research methods used to generate the *Go Maritimes* transit database, to elicit user and provider feedback, and to seek technical expertise; third, to summarize the startup and operational cost estimates, as well as revenue stream opportunities.

Collaborative transit planning

The dynamic and inter-jurisdictional nature of transit systems is suited to collaborative planning (Taylor & Schweitzer, 2005). The incorporation of stakeholder values into the transit planning process means that the system will be more appropriate for users (Brabham, Sanchez, & Bartholomew, 2009). Scepticism often surrounds the use of collaborative methods to determine the best mechanisms for action (Booher & Innes, 2002; Ugboro et al., 2001). Compromise and failure are common concerns. Motivations for collaboration in the transit industry include: financial self-sufficiency, improved decision making, the efficient use of resources, shared industry expertise for high quality service, cost savings, and improved system performance (Ugboro et al., 2001). A number of key stakeholders are and should be involved in the collaborative transit planning process, including government (The Canadian Urban Transit Association, 2005), transit professionals and planners (Booher & Innes, 2002), transit providers (Ugboro et al., 2001), users (Walter & Scholz, 2007), and non-profit organizations (Groszko, 2010).

Collaboration between Dalhousie University and the EAC

As previously noted, the *Go Maritimes* database represents a partnership formed in the fall of 2012 between six graduate students at Dalhousie University and the EAC in Halifax, Nova Scotia. This partnership worked well as all parties shared a common research interest and recognized the value of contributing toward a sustainable transit system. The end goals of this research initiative are to further develop cooperation between service providers, enhance service coverage and efficiency, and to make transit information readily available to the public. To achieve this, a collaborative database containing transit data (e.g. schedules, routes) was recognized as an appropriate way to connect transit stakeholders. Ideally, transit users could use this database to identify the best available route and time to get from one location to another.

Methods

Four main methodological thrusts define the transit database project: first, a review of transit database precedents; second, a usability study of potential database users (n=6) for further insight into website and database development; third, a feasibility study reaching of transportation providers (n=10) to determine their interest and involvement in contributing to a transit database cooperative; and lastly, web-expert consultation to direct the development and

functioning of the transit database prototype.

A chronological depiction of the research process is illustrated in Figure 1.0. The colour-coded boxes indicate project collaboration. The blue boxes represent the work completed or to be completed by the EAC. The green boxes represent work that has been completed by the Dalhousie University research team. The abovementioned methods were used to inform the two main project deliverables, a report outlining recommendations moving toward transit database implementation and a basic functioning website and database, referred to as Prototype 1.0.

The transit project was handed over to the EAC in December of 2012. The Transportation Committee at the EAC will be responsible for continuing transit networking with current and future transit providers, developing future database prototypes, and monitoring the industry and modify the database accordingly.
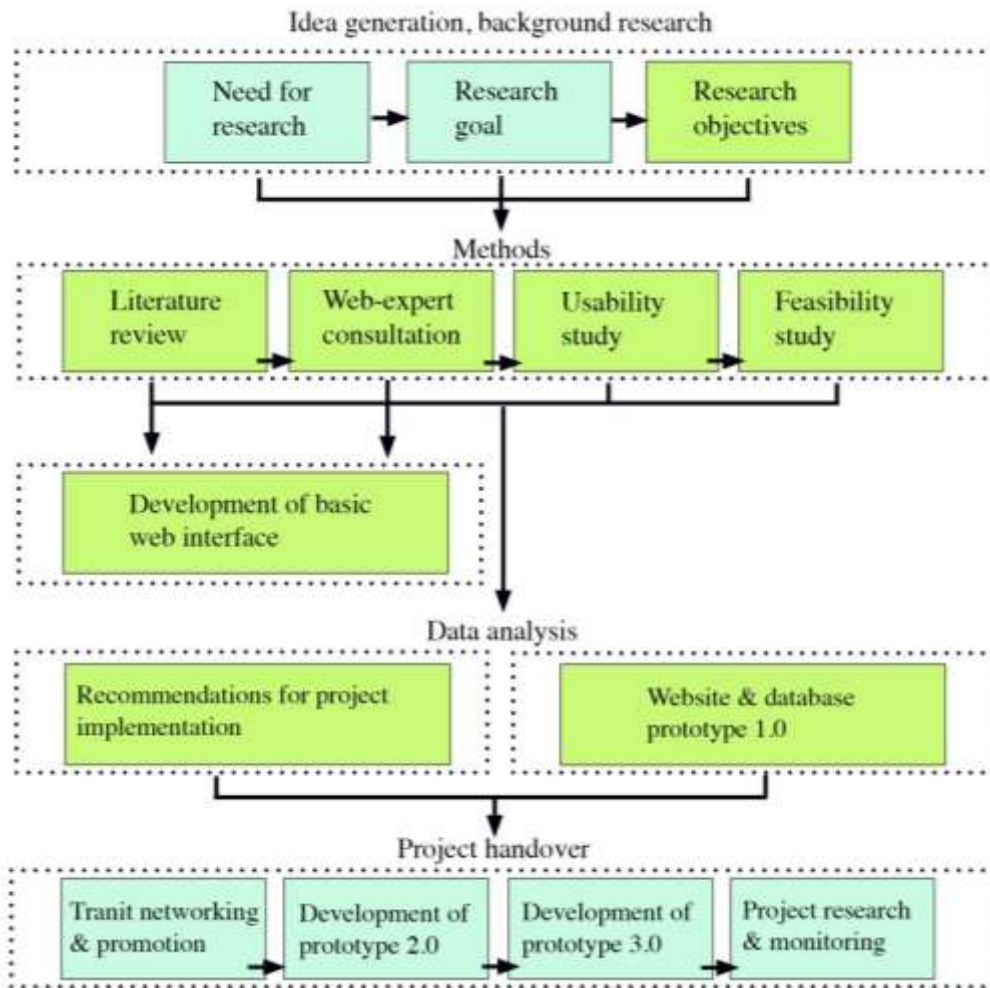
Figure 1.0: A chronological depiction of the transit database research process.

Transit database and website precedents

A valuable starting point for the database project was the review of existing transit database models. Features of these models have been incorporated into the preliminary prototype. Upon review of the Saskatchewan Transportation Company (STC)'s website (2012), the following qualities and features have been identified as valuable: the streamlined design and quality; the efficiency of the system considering the number of communities to service (287 communities on 29 bus routes); and the variety of departure times, number of stops, and dates of availability. The transportation model hosted by Newfoundland and Labrador Tourism (2012) is unique because the customer plans a trip by selecting a method of travel ranging from taxi to shuttle to bus. This option offers the same degree of flexibility and simplicity as offered by the STC, but allows an added level of customizable travel. Destination search options developed by *Expedia.ca* serve as inspiration, where multiple travel providers have collaborated to provide ticket searches and purchasing on one website (Expedia Inc, 2012). The simple display model and visuals resulting from a *Google* and *Google Maps* (Google Inc, 2012) search is a powerful website interface that is both intuitive and user friendly.

Web-expert consultation

Project succession was dependent upon professional web experts: Grant Wells, a member of the computer science faculty at Dalhousie University and web/database developer with Trifold Consulting, and Richard Pannell, a student enrolled in the computer science program at Dalhousie University. Their insight into web development, web hosting service, and design were invaluable. More specifically, Wells imparted his knowledge of web hosting, website functionality, and the pros and cons of specific web design software (G. Wells, personal communication, October 12, 2012). Wells suggested exploring the possibility of using Wordpress to create and host the website. While this was a viable option, being both free and open source, it would not allow the team to use its existing design, created using the Adobe Dreamweaver web design software. Furthermore, the team explored using Drupal, an open source content management system. While both Drupal and Wordpress could offer hosting and design functionality simultaneously, this was determined late in the website development process after the website design was completed using Adobe Dreamweaver. As such, the team opted to use the GoDaddy service, a hosting platform that also offered compatibility with Adobe Dreamweaver. The cost associated with GoDaddy was low in comparison to the time and cost required for a website redesign to be compatible with Wordpress.org and Drupal.

Usability study

The integration of user feedback into digital research, design, and development creates for

more robust and effective online tools (Jones, Rieger, Treadwell, & Gay, 2000). Determining the best method of user feedback began with a comparison between a usability study and a focus group. Ultimately, the suitability of the method was dependent upon the research objectives and informational needs of the *Go Maritimes* project (Degu & Yigzaw, 2006). It was uncertain whether the project required the collection of personal information and values, in which case a focus group would be suitable. A focus group is a particularly useful method for generating discussion between a group of participants on issues specified by researchers. This style of group interview capitalises on communication between participants (Kitzinger, 1995; Glicken, 2003; Murgado-Armenteros, Torres-Ruiz, & Vega-Zamora, 2012). It was determined early on in the project that a values-based group discussion would not be the best option for continued development of the transit database. Rather, the project could be better served by requesting that users test the functionality of the website. Consequently, the team did not gather the personal information of study participants.The team concluded that a usability study would be the most valuable method of evaluating the website.

Although the team has been actively testing the website, the viability of the project required an unbiased and unfamiliar group to test its functionality. A usability study is an effective tool to bring users of a product together to determine usefulness, efficiencies, inefficiencies, and to provide a baseline measure to compare future iterations (Jones et al., 2000; Health Design and Technology Institute, 2012). The usability study served as an important producer of database and website information and recommendations that will be used to enhance and improve the website. Conveniently, pursuing a usability study did not require Dalhousie University course-based ethics approval as no sensitive or personal data was collected. Six study participants were identified through a purposive sampling approach. As potential transit database users, individuals were selected based on their ability to provide rich data (Jupp, 2006). Participants were presented a project overview and a brief explanation of how to use the *Go Maritimes* website. The project team monitored how easily participants navigated the site; answered questions when required; and facilitated a conversation of website usability. The feedback from potential end-users provided the team with valuable insight into the issues most pertinent to them as well as which transit routes would be frequented.

Feasibility study

Analyzing the viability of an idea before proceeding into a venture is central to good business and project planning. A feasibility study is one option to evaluate project uptake, market conditions, and possible business or project alternatives (Hofstrand & Holz-Clause, 2009). A feasibility study was conducted to gauge the interest of Maritime transportation providers on the idea of a collaborative transportation service. A number of service providers (namely Cambell's Shuttle, Cloud Nine Shuttle, East Coast Shuttle, Island Shuttle, Macleod's Shuttle)

were contacted via e-mail and telephone and were asked a series of pre-determined questions relating to the *Go Maritimes* web-service. As with usability study participants, feasibility study participants were identified using a purposive sampling approach (Jupp, 2006). These providers were selected because of their prominence in the Maritime transit network and the perceived willingness of these providers to submit feedback. Questions posed to service providers included:

    i)   Do you feel this website would add value to your business?
    ii)   Would you be willing to pay for this kind of service?
    iii) If so, could you estimate the size of the payment you would be willing to make?

Contacting the transportation providers was meant as an initial step toward gaining the support of service providers for the *Go Maritimes* web service. After little response from service providers, additional communications between project supervisor, Wayne Groszko, and transportation operators facilitated this process.

Results and Discussion
Cost and revenue

Both the Province of Nova Scotia (2012) and the Halifax Regional Municipality (HRM) (Fraser, 2012) have funded transit research and start-up investment for transit carriers in the past. Arguably, more funding and attention could be paid to community transit projects, especially those that promote ridership and support local business. The *Go Maritimes* database is the first of its kind in the Maritimes and as a result, there are no funding precedents. Transit projects such as the *Go Maritimes* database will rely on independently-sourced revenue streams for start-up and operating costs.

Conversations with web developer Richard Pannell, professor and transit researcher Wayne Groszko, and the review of professional service cost-estimates have given the group a basis for start-up and operational costs associated with a database of this caliber. Much of the initial startup work hours have been volunteered. The costs associated with the analysis are hypothetical and are expressed in full value of what the team would expect to pay if volunteers were not involved.

An initial scan of community-supported financial investments have yielded six potential revenue streams, including: community grants (TD Bank Charitable Foundation, Indiegogo), government support, sale-based revenue, pay-per-click and search, hosting web advertisements, and *Go Maritimes* advertisements. Although we have identified possible

funding sources within each stream, this is a preliminary search. It is not known how much funding could be contributed from each source or if *Go Maritimes* would be eligible for funding. The organizational structure created to run the transit database would determine the type of funding available for start-up and operation. For example, a charity or non-profit will have different financial opportunities and limitations than a cooperative or business (Social Finance, 2010). A business model will be required before long-term investment can be secured. Groszko (2010) believes that after a few years of successful operation, the *Go Maritimes* model will be able to operate on advertising and commission revenues with limited input from the provincial government. However, because of the contribution to a common public interest, there will likely always be a role for government funding (Groszko, 2010). Table 1 outlines

Table 1.0: Financial analysis. Revenue requirements for the operation and maintenance of *Go Maritimes* web-service with corresponding estimated values. Potential revenue sources and corresponding estimated values are also included. Revenue sources must amount to ~$12,242 or greater annually for this project to be financially feasible. Annual revenue requirements will likely decrease over time.

Revenue requirements	Estimated value ($)	Revenue source	Estimated value ($)
Hosting space	80.00/yr	Community grants (e.g. Aviva Community Fund, TD Bank Charitable Foundation)	Unknown
Domain name	~12.00/yr	"Nova Scotia Moves" grant offered through Nova Scotia Department of Energy	The province will match funding that the project raises either in the form of funds or volunteer services
Website maintenance (additional web design, development and modifications)	$50.00/hr x ~35hrs/yr = ~1750/yr ~3000.00 for finished site	Indiegogo campaign Sale-based revenue	2000.00/start-up Unknown
Website operator (adding to database, communication and operation, revenue sourcing)	$20.00/hr x ~520hrs/yr = ~10,400/yr	Pay-per-click/search	(Unknown) Dependent on website traffic
		Go Maritimes co-op fee	$100.00/yr/transit provider (~15) = 1500/yr
		Volunteer hours	400hrs/yr x $15/hr = 6000/yr
Total:	~12,242.00/yr	Total:	~19,000.00

*Note: total estimated value from revenue sources includes Indigogo start-up funding and a grant offered through the Nova Scotia Department of Energy, neither of which have been confirmed. Indigogo start-up funding is not an annual source. As a result the estimated value for all revenue sources is ~15,000.00/yr for subsequent years.

website and database revenue requirements, potential revenue sources, and the corresponding estimated values for the *Go Maritimes* project.

Analysis and Recommendations

Usability study feedback

As described in detail in the Methods and Approach section, the usability study that was hosted on 9 November, 2012 yielded rich data to be taken into consideration for future development of the transit database. User recommendations have been categorized into three areas: desirable tools and features, layout and design, and general faults and areas of improvement.

Study participants recommended a number of desirable features that would benefit the *Go Maritimes* database including the ability to save previous searches in the search menu, which could be incorporated into a user login function. A web-link to purchase transit tickets online was a common request by study participants. Furthermore, additional information related to transit service pickup and ticket price should also be incorporated into the search results. Conversation was generated around the integration of a discussion forum on the *Go Maritimes* website. Study participants explored the idea of discussion threads to organize ride sharing.

Two very different web design concepts were presented to usability study participants. The first incorporated a simplistic design, akin to that found on websites such as Google, and the second interface was a more developed multi-page web design. Generally, participants found the simple model to be effective and intuitive yet some mentioned it was overly simple and amateur in appearance. The more developed model was said to have a more professional aesthetic while others found it to be overly "commercial". Given these opinions, it would appear that a hybrid model of the two designs would be appropriate.

Participants were asked to describe unresolved issues with the website; they revealed that a number of points still needed to be considered by the team, such as resolving broken links and blank pages when search results yield a service not offered. It was recommended that, in the case of an unsuccessful search, the website should suggest the next closest location offered within the transit database. Moreover, the results from unsuccessful searched should be saved to inform the development of future routes and schedules. Participants described a need for a drop-down menu for ease of searching, instead of typing out the desired destination. An option to suggest routes that are not in the system would allow database managers to keep records of how many times alternative stops or routes were requested. Lastly, study participants

requested that maps be provided with every search to provide geographical context, similar to the feature offered through Google Transit.

Feasibility study feedback

The feasibility study initiated with transit providers is still ongoing and has extended beyond the scope of this project. The ongoing nature of this feedback mechanism means that transit provider feedback and recommendations will not be included in website prototype 1.0, but will be included in subsequent prototypes. Although the preliminary review of the *Go Maritimes* service is a positive one, the greater acceptance within the transportation industry is still unknown. Despite the delay in feedback, the project group views this feedback as essential in moving forward to determine project development deadlines, a business model to handle operation and management of this tool, and funding opportunities for the project to gain momentum.

Challenges to transit collaboration

Without a question, there has been a remarkable shift in the online presence of transit users (Transportation Research Board, 2006). To not take advantage of this online presence would be a missed opportunity. When people cannot meet face-to-face, the web fosters a sense of dialogue within a community (Brabham et al., 2009). That being said, not everyone is web-proficient or has access to a computer.

Transportation Canada (2012) recognizes that, similar to other sectors of the Canadian economy, the 2008-2009 financial crisis negatively affected the transportation sector. A lack of sustained funding is a major obstacle to a robust information management network (The Canadian Urban Transit Association, 2005).Transit data management and sharing requires investment. Funding is essential for the latest technology to collect and deliver up-to-date information (Transportation Research Board, 2006).

Barriers to transit provider collaboration include the drafting of multiparty system goals, the allocation of costs and revenue, and the view that collaboration is competition (Ugboro et al., 2001). The aforementioned concerns suggest the need for a local transportation strategy or a transit collaborative with defined goals and objectives as outline by Groszko (2010).

Opportunities for transit collaboration

Collaboration is central to a long-term strategic planning vision (McCall & Young, 2005). Strong community partnerships for funding and public outreach reinforce a long-term vision. Partnering with NGOs is a good starting point to reach potential transit users and the public. Industry and corporations could provide funding and revenue alternatives. There are

noteworthy community examples of information- based transit initiatives aimed at creating accessible and improved transportation systems: *Transit 360* (MindSea Development Inc, 2012), *It's more than buses* (Planning and Design Centre, 2011), and *Go Maritimes.* These examples, successful in their own respects, require investment and promotion to be recognized to their full potential.

Recent provincial government support will continue to foster collaborative transit planning projects in Nova Scotia. A 2012 adjustment was made to the application and approval process for new carriers and service changes in Nova Scotia. Responsibility was shifted from the Nova Scotia Utility and Review Board to the provincial Transportation Minister (Doucette, 2012). A 2012 grant has been established to support local, creative, and collaborative sustainable transit opportunities in Nova Scotia. The province is currently in the developmental stages of the new *Sustainable Transportation Strategy*. It is during the planning stages where collaboration with all levels of government and stakeholders is effective in shaping a sustainable system.

Moving forward

Successful project implementation is complex and requires attention to many details (Slevin & Pinto, 1987). A wide variety of human, technical, and financial factors were taken into consideration by the project team. Improving the functionality of the *Go Maritimes* website is the research team's primary focus before the project can be presented to the public. Feedback from usability study participants has guided this process.

Planning for two additional prototypes of the *Go Maritimes* website is underway. Prototype 2.0 will incorporate, where possible, the comments and recommendations made by the usability study participants. Populating additional transit provider data into the *Go Maritimes* database, adding revenue generating advertisements, and refining website design will be the key themes in the development of the *Go Maritimes* prototype 2.0.

A discussion board or open forum is being explored as an option for a third prototype of the *Go Maritimes* website. An open forum would be useful for maintaining dialogue between transit users and providers, as well as to facilitate online discussion for transit opportunities within the Maritimes. In prototype 3.0, a fully functional website will include options for purchasing transit tickets directly from *Go Maritimes*, as well as links to pre-existing service provider websites and information. Finally, the possibility of incorporating *Go Maritimes* data (e.g. routes and schedules) into the Google Transit application will be explored. Given the large number of established users of Google Transit, this feature would likely increase the accessibility of the *Go Maritimes* web services, potentially facilitating long-distance travel within the Maritimes.

Conversations with Maritime transit providers are on-going. Although a full set of recommendations and comments have not been compiled within the study period, the Dalhousie team and the EAC will continue to consult with providers and review feedback to improve the website. The *Go Maritimes* model will be strengthened with a strong network of service providers, users, and allied industries such as tourism, lodging, and recreation. Groszko (2010) explores the possibility of establishing a cooperative business model to create and maintain a collaborative transit database. Although often thought of in an agricultural and food supply context, cooperative models have been applied to other forms of business (Birchall & Ketilson, 2009). In this model, *Go Maritimes* would be owned and operated by its members, including transport providers, users, and advertisers. Cooperatives have a number of key benefits which make this model ideal for the *Go Maritimes* service. Primarily, cooperatives allow for the collaboration of like-minded people and would promote continued growth and development. Cooperatives also incorporate an element of permanence, where the project is likely to continue even if members leave (Government of Newfoundland and Labrador, 2012). This is necessary if *Go Maritimes* is to become a staple in facilitating Maritime transportation.

Still in the organizational stages, the administrative side of *Go Maritimes* has and will continue to rely upon volunteer support to further develop the website and database, conduct transit networking, and search for funding opportunities.

Conclusion

The Internet has transformed the way information is accessed by users and transportation professionals alike, and is often the first and only means of seeking transportation-related information. In the development of the web-based information service, *Go Maritimes*, the research team capitalized on the online presence of transit providers and users to coordinate transit services in the Maritime Provinces. Subsequent to a thorough review of database precedents and a number of iterations of prototype 1.0, the *Go Maritimes* website is well on its way to becoming a 'one-stop shop' database for local transit users and tourists seeking travel options within the Maritime Provinces.

While the need for an online database was identified early on in the project, the process involved in delivering this goal has been a significant multidisciplinary and collaborative undertaking. Maintaining an open dialogue and incorporating the values and concerns of multiple stakeholders is essential to a coordinated transportation system within this region. In general, usability study results indicate an optimistic view that, given the incorporation of recommended elements, the *Go Maritimes* database would be a valuable service for travelers.

This being said, future success of the *Go Maritimes* project will be dependent on continued stakeholder collaboration.

As the EAC assumes full management of the *Go Maritimes* website, the prototype frameworks will be essential to project planning and management. The projected financial analysis outlines basic cost estimates, as well as potential revenue streams. Succession planning has been a common thread throughout this entire report. The future viability of the *Go Maritimes* website is a central element to its overall success. This report has equipped the EAC with the tools it needs to plan, manage, and move forward with the *Go Maritimes* project.

References

Albalate, D., & Bel, G. (2010). What shapes local public transportation in Europe? Economics, mobility, institutions, and geography. *Transportation Research*, 46(5), 775–790.
http://dx.doi.org/10.1016/j.tre.2009.12.010

Bhatta, S., & Drennan, M. (2003). The economic benefits of public investment in transportation. *Journal of Planning Education and Research*, 22(3), 288-296.
http://dx.doi.org/10.1177/0739456X02250317

Birchall, J., & Ketilson, L. (2009). *Resilience of the cooperative business model in times of crisis.* Retrieved from http://www.ilo.org/wcmsp5/groups/public/---ed_emp/---emp_ent/documents/publication/wcms_108416.pdf

Booher, J., & Innes, D. (2002). Network Power in Collaborative Planning. *Journal of Planning Education and Research*, 21(3), 221-236.
http://dx.doi.org/10.1177/0739456X0202100301

Brabham, D., Sanchez, T., & Bartholomew, K. (2009). *Crowdsourcing public participation in transit planning: preliminary results from the next stop design case.* Retrieved from http://pressamp.trb.org/compendium/508/81797BFFDA77.pdf

Canadian Urban Transit Association (2005). *Transit in Canada: an industry on the move.* Retrieved from http://www.cutaactu.ca/en/publicationsandresearch/resources/IssuePaper No.12_TransitinCanada_AnIndustryontheMove.pdf

Cotfas, L., Croicu, M., & Cotfas, D. (2009). A collaborative GIS solution for public transportation. *Informatica Economică*, 13(2), 50-58.
http://www.revistaie.ase.ro/content/50/006%20-%20Cotfas.pdf

Dalhousie University (2012). *Unit Level Research Ethics Committee.* Retrieved from http://www.dal.ca/faculty/agriculture/research/for-researchers/unit-level-research-ethics-committee.html

Degu, G., & Yigzaw, T. (2006). *Research Methodology.* Retrieved from http://www.cartercenter.org/resources/pdfs/health/ephti/library/lecture_notes/health_science_students/ln_research_method_final.pdf

Doucette, K. (2012). *Nova Scotia to change intercity bus rules*. Retrieved from
        http://metronews.ca/news/canada/442503/nova-scotia-to-change-intercity-bus-rules/

Ecology Action Centre (2012). *About the Ecology Action Centre*. Retrieved from
        http://www.ecologyaction.ca/

Expedia Inc. (2012). *Your Trip, Your Way*. Retrieved from http://www.expedia.ca

Fraser, L. (2012). *Shuttle service gets rolling*. Retrieved from
        http://thechronicleherald.ca/metro/145966-shuttle-service-gets-rolling

Glicken, M. (2003). *Social research methods: a simple guide*. Boston: Pearson Education Inc.

Gómez, A. (2004). *Transit Planning in Curitiba and Bogotá. Roles in Interaction, Risk,
        and Change*. (Unpublished doctoral dissertation). Massachusetts Institute of
        Technology, Cambridge, MA. http://hdl.handle.net/1721.1/28791

Google Inc. (2012). *Google Maps/Transit*. Retrieved from http://maps.google.ca

Government of Newfoundland and Labrador (2012). *Module #1: basics of the cooperative
        model*. Retrieved from http://www.ibrd.gov.nl.ca/regionaldev/Basics_of__
        Co_operative.pdf

Government of Nova Scotia (2012). *Nova Scotia moves*. Retrieved from
        http://www.gov.ns.ca/energy/nsmoves/documents/Nova-Scotia-Moves-Pilot-
        description.pdf

Groszko, W. (2010). *Which way forward? A public transit map of Nova Scotia*. Retrieved
        from http://www.ecologyaction.ca/files/file/transit_forward_groszko.pdf

Health Design and Technology Institute (2012). *Usability Studies: Taking Part*.
        Coventry University. Retrieved from:
        http://wwwm.coventry.ac.uk/hdti/Getinvolved/Documents/HDTIUsabilityStudies-
        TakingPart.pdf

Hofstrand, D., & Holz-Clause, M. (2009). *What is a Feasibility Study?* Retrieved from
         https://www.extension.iastate.edu/agdm/wholefarm/html/c5-65.html

Jones, M., Rieger, R., Treadwell, P., & Gay, G. (2000). *Live from the stacks: user feedback on mobile computers and wireless tools for library patrons*. In Proceedings from the fifth ACM conference on Digital libraries. San Antonio, Texas. http://dx.doi.org/10.1145/336597.336646

Jupp, V. (2006). *The SAGE Dictionary of Social Research Methods*.

Kitzinger, J. (1995). Introducing focus groups. *BMJ*, 311(7000), 299-302. http://www.bmj.com/content/311/7000/299

McCall, D., & Young, J. (2005). *Eliminating static from strategic planning*. Retrieved from http://www.facilitate.com/support/facilitator-toolkit/docs/Strategic-Planning-Goes-Online.pdf

MindSea Development Inc. (2012). *Transit 360*. Retrieved from https://itunes.apple.com/ca/app/%20transit-360/id350572383?mt=8

Murgado-Armenteros, E., Torres-Ruiz, F., & Vega-Zamora, M. (2012). Differences between online and face-to-face focus group, viewed through two approaches. *Journal of Theoretical and Applied Electronic Commerce Research*, 7(2), 73-86. http://dx.doi.org/10.4067/S0718-18762012000200008

Newfoundland & Labrador Tourism (2012). *Plan Your Trip*. Retrieved from http://www.newfoundlandlabrador.com/planyourtrip

Planning and Design Center. (2011). *It's More Than Buses Next Steps*. Retrieved from http://pdcentre.ca/2011/09/its-more-than-buses-session-3-outcomes/

Province of Nova Scotia (2012). *Eight Community Transit Groups Receive Funding*. Retrieved from http://novascotia.ca/news/release/?id=20120726004

Saskatchewan Transportation Company (2012). *Welcome to STC*. Retrieved from http://www.stcbus.com/

Slevin, D., & Pinto, J. (1987). Balancing strategies and tactics in project implementation. *Sloan Management Review*, 29(1), 33-41. http://www.iei.liu.se/fek/utbildning/kurskatalog/723g18/articles_and_papers/1.107456/PintoSlevin1988.pdf

Social Finance (2010). *The what, why, who, and most importantly, the how of social finance in Canada*. Retrieved from http://socialfinance.ca/guide/am-i-eligible/legal-structures-charities-non-profits-and-co-operatives

Taylor, B., & Schweitzer, L. (2005). Assessing the experience of mandated collaborative inter-jurisdictional transport planning in the United States. *Transport Policy*, 12(6), 500-511. http://dx.doi.org/10.1016/j.tranpol.2005.04.004

Transportation Canada (2012). *Transportation in Canada 2011: Comprehensive Review*. Retrieved from http://www.tc.gc.ca/media/documents/policy/Transportation_in_Canada_2011.pdf

Transportation Research Board (2006). *Transportation Knowledge Networks: A Management Strategy for the 21st Century*. Retrieved from http://onlinepubs.trb.org/onlinepubs/sr/sr284.pdf

Ugboro, I., Obeng, K., & Talley, W. (2001). Motivations and impediments to service contracting, consolidations, and strategic alliances in public transit organizations. *Administration & Society*, 33(1), 79-103. http://ejournal.narotama.ac.id/files/79.pdf

Walter, A., & Scholz, R. (2007). Critical success conditions of collaborative methods: a coparative evaluation of transport planning projects. *Transportation*, 34(2), 195–212. http://www.uns.ethz.ch/people/formerhead/scholzr/publ/1545.pdf