HOW MANY NEW BRUNSWICKERS RELY ON ORGANIZED VOLUNTEER DRIVER PROGRAMS? PRELIMINARY TOOLS AND APPROACHES TO HELP US FIND THE ANSWER

Trevor Hanson, University of New Brunswick
Matthieu Goudreau, University of New Brunswick

1   Introduction

Organized volunteer driver programs are emerging as solutions to fill the transportation service gap for those unable to meet their personal transportation needs independently with the private automobile and where taxi, transit or active transportation are unrealistic or unavailable options. Volunteer driver programs (VDP) are typically able to serve areas of low population density at a lower overall cost than paratransit services by using volunteer labour and vehicles. They replicate the on-demand travel and social aspects associated with relying on friends and family for transportation, which is attractive to those who do not have access to a personal network. VDP can be stand-alone programs, extensions of non-profit or charitable activities, or in some instances in the United States, are integrated as part of rural transit. Many of these programs are targeted to supporting the transportation needs of older adults, the population of which is expected to double in Canada by the year 2036 (FCM, 2011).

The challenge is that little is understood about how VDPs collectively work to satisfy Canadian transportation needs and how they will respond to meet growth in ridership anticipated with an aging population. Individual programs may record trip information for their own planning purposes, but unlike personal vehicle use, transit, or taxis, there is not a broad understanding of the number of Canadians that rely on these programs, the degree of their reliance, the types of trips they take, and distances they travel. Without a clear understanding of how VDP work, there are risks that programs may not be able to meet demand, programs may have challenges with replication and sustainability, and there may be missed opportunities to employ these programs in underserved markets.

This paper summarizes recent efforts to quantify the broader usage of these programs in New Brunswick. While confounded by differing data collection and reporting approaches among groups, this paper offers a preliminary estimate of usage, as well as the results of an exercise to develop a common reporting tool.

2   Background
VDPs in North America are typically organizations with non-profit or charitable status that rely on volunteers to provide some or all elements of a transportation service to a clientele that would otherwise be too costly or inefficient to serve by public or private sectors, such as those living in rural areas. The volunteer can provide the driving function, may also provide their own personal vehicle, and in some cases provide an escort function. Some VDPs employ paid staff and compensate their volunteers for the costs they outlay.

In the United States, the Beverly Foundation and the AAA Foundation for Traffic Safety (2004) assembled a VDP database including attributes on over 400 programs, categorized as "Supplemental transportation programs for seniors" or STP. They defined STP as "community-based transportation programs that complement or supplement existing transportation services…". Data from 2004 found that 40% of the over

200 responding programs in the database target rural areas, 61% target medical appointments, and 50% of users are "Seniors". While a useful approach, the report and related literature does not attempt to quantify the number of older adults that rely on these programs, the degree of their dependence, overall trip making metrics, or passenger-miles. It appears to be developed to support the development of new programs rather than to answer broader questions about the use of the programs to meet societal trip-making needs. There is no equivalent resource in Canada and the U.S. resource is no longer maintained.

Previous work by Hanson (2009, 2011, 2014) has highlighted the potential of client-focused volunteer driver programs to help meet the transportation needs of rural older adults, in particular in areas not served by transit, citing a New Brunswick example, the Charlotte Dial-a-Ride, as a model for other programs. The Charlotte Dial-a-Ride serves a predominantly rural region with a central dispatch service and a team of volunteer drivers using their own vehicles, and for several years, remained the only program of its type in New Brunswick. Successful replication of its model in New Brunswick remained elusive, though over time, and fostered by funding from the Economic and Social Inclusion Corporation (ESIC) of New Brunswick (a Crown Corporation), eight other similar VDPs have since begun operation throughout New Brunswick. These programs involve a central dispatch and serve primarily rural regions with volunteer drivers, most of which use volunteer-supplied vehicles.

The growth in program development, in concert with a rapidly aging rural population in New Brunswick, suggests that volunteer organizations are responding to changing needs in transportation that see individuals less reliant on their own personal vehicles. Little is understood about the operation and uptake of these services by clientele and volunteers beyond the limited descriptive statistics maintained by each organization, and as discussed by Hanson and Caissie (2016), these statistics may not be comparable due to differing data collection practices. An eventual goal is to look at these programs through a transportation engineering lens, in particular for understanding user mode choice when considering multiple options, and to eventually predict ridership, volunteer supply, and sustainability. The first step is to develop a common data collection standard among volunteer groups.

3 Methodology

The following sections describe the process to review existing data collection practices of participating VDP in New Brunswick and to develop a common trip data collection format. Since beginning the project, several VDP in New Brunswick have met collectively to share current and best practices; two of these meetings were used to solicit feedback from the participating groups regarding their current data collection practices. This research only involves those groups participating in an informal assembly; it is not known the extent of all volunteer driver programs in New Brunswick, though it can be expected that these programs are the most extensive in terms of service area and patronage.

3.1 Operator perspectives

Most operators had developed their own data collection processes from the ground up in response to the reporting needs of their organization. Adopting a new data collection process meant meeting criteria including:

- Minimizing data collection burden on volunteer drivers and dispatchers;
- Aligning with trip purposes, etc., necessary for their reporting obligations to funders.

3.2   Development of a common data collection reporting format

A total of 5 of the 8 formalized VDPs offered to share up to one year of anonymized drive/trip data with the researchers in the format they developed independently, though two groups were brand new and only in a position to share 6 months of data. These data were reviewed to determine common data entry and recording practices, practices that were unique (but necessary) for select operators, and unique practices that had potential to be used by others. During this process the participating VDPs were asked for the definition of their data terminology to ensure consistency between group reporting styles, which was confirmed at a meeting of all groups. Programs were also invited to provide descriptive statistics on number of staff, total volunteers and total clients.

3.3   Estimating descriptive statistics

The drive data from each group were combined into a single Excel file where each drive/trip were reviewed in terms of one-way or roundtrip records and trip purpose (including whether a trip returned home) and converted into "drives" as defined in the following section in order to permit comparison.

4   Results of efforts to develop a common data reporting format

The following sections detail the efforts to develop a common data collection format, including a common definition for trips and drives, and trip types.

4.1   Developing a common definition for trips

Most VDPs in New Brunswick reported trip-making behaviour in terms of "Drives", which was originally considered to be inclusive of all the travel provided by a volunteer driver to a client which ends when the driver is free to serve other clients, typically "home" where the drive initially originated. The challenge with using this definition of "Drives" as a metric is that is does not permit a complete recording of trip purposes, leading to underreporting of activities and difficulties in comparing among groups. The definition of "Drive" was refined to include a reference to stops:

- A **drive** is inclusive of all **stops** provided by a volunteer driver to a client which begins when the client is picked up and ends when the driver is free to serve other clients. A **stop** (or trip) represents the one-way travel activity from an origin to a destination; a drive consists of at least one stop.

Organizations that collect "stop" (or trip) data would be able to express the use of the service in terms of "person-stops" (or person-trips), permitting a more equitable comparison of service use. Only one of the VDPs in New Brunswick used the "stop" definition in addition to reporting "drives", prior to the group meeting.

4.2   Defining Trip Types

The travel data provided by the five participating groups for this research effort were reviewed to determine whether a common list of trip purposes could be developed; in a previous effort with seven of these groups, Hanson and Caissie (2016) found 13 different ways "Medical" trips were being reported. The programs that shared travel data had differing lists of trip purposes; some used broad categories while others used specific definitions within categories. A total of five broad categories were evident: Health, Life Maintenance, Work or Education, Quality of Life and "Unknown". Trip purposes were defined as follows:

- **Health** included any trips that contained a non-emergency medical purpose such as trips to hospitals, clinics or the pharmacy. Apart from basic medical care this category also included trips relating to mental health and physiotherapy;

- **Life Maintenance** contained self-sustaining errands such as grocery shopping, banking, legal advice;
- **Work or Education** trips included any trips to work, volunteering, or training;
- **Quality of Life** trips were any trips made to community events or locations of leisure, such as bowling or bingo;
- The **Unknown** category was used by researchers to describe data that was lacking information required to deduce the purpose of the trip.

4.3 Identifying common types of travel information collected by VDP

VDPs generally collected two types of information on trip-making: **Drive Data** and **User Data**. Drive Data are data used to help manage the operations of the VDP and focused on what the volunteer does, including (but not necessarily collected by all):

- Date, start time of drive;
- Unique Drive ID number;
- Number of clients/users & escorts;
- Distance travelled;
- Number of stops;
- Purpose of stops (general).

User Data focused on how each client used the service which included:

- Date, start time, purpose for each stop;
- Each stop for each user has a unique ID number but a common Drive ID.

Not all groups collected all aspects of the Drive Data and User Data indicated above, and in some cases, groups tried to collect both information in the same record in a spreadsheet. While effective when dealing with a single client on a single trip purpose, it would not be possible to associate a Drive purpose with a particular user if two or people shared a ride and trip purposes were different. If a group wished to continue collecting User Data, it would need to refine its approach in order to be scalable.

5 Preliminary operational data from select VDP in NB

The following section details preliminary findings of operational data from the VDP who shared data with the researchers. There are a number of caveats:

1. Only 5 of 8 active groups were in a position to share travel data with the researchers; therefore this is not a complete record of VDP usage in New Brunswick. Note that 2 of the 5 groups were newly created and only had 6 months of data to provide;
2. Not all groups provided the one year of travel data between the same start and end month;
3. Of the groups who shared travel data, there were inconsistent definitions of "drives", "stops" and trip purposes; the researchers created their own "drive" database from the VDP supplied data based on the definitions and categories described in section 4 which required some interpretation of the supplied data;
4. Only 1 group actively collected "stop" data.

5.1 Descriptive statistics (all participating programs)

The data in Table 1 show the maximum and minimum attribute values over the course of one year for the five participating groups in terms of human resources, number of drivers and clients, drives provided and

total distance driven. One group was responsible for about 44% of the total reported kilometres. Given that some programs are newly formed (and starting small), it could be expected that their ridership values will increase over time. Ideally, groups would have provided summary information for the same time period of the year (e.g. January to December), but this was not possible, so the following information represents a summary of each participating groups' data for one year, rather than a report on "drives provided in 2016" for example.

Table 1 Summary of Volunteer Driver Program Attributes for one year of operation

	Min	Max	Avg.	Total
Paid Staff	1	2	1.25	5
Active Volunteer Drivers	10	28	21	82
Members/Clients	48	213	105	421
Number of Drives	40	1391	660	3286
Total Km Driven	3104	107579	49200	246013

The data in Table 2 show that "Health" drives featured prominently among most groups, along with "Life Maintenance". "Work or Education" also featured prominently for one group given the scope of their mandate also included employment and education drives.

Table 2 Volunteer Driver Program Drive Purpose Distribution for one year of operation

Drive Type	Min	Max	Avg.	Total
Health	10%	70%	56%	1849
Life Maintenance	1%	85%	20%	671
Quality of Life	0%	24%	3%	111
Work or Education	0%	39%	17%	559
Unknown	0%	6%	3%	96

The data in Table 3 show that for the participating groups, "Work or Education" drives were the most likely to be shared, while "Health" and "Life Maintenance" were most likely to be taken by a single passenger.

Table 3 Volunteer Driver Program Drive Purpose Details for one year of operation

Drive Type	Drives	Persons transported	Persons/Drive	Avg. km per drive
Health	1849	2005	1.1	81.7
Life Maintenance	671	753	1.1	44.8
Quality of Life	111	135	1.2	46.7
Work or Education	559	1079	1.9	85.7
Unknown	96	97	1.0	133.2

Health drives appear to consume the most resources of all known trip types. They have the lowest utilization rate in terms of persons per drive, longest distance travelled per drive, and have been reported to typically take place during working hours.

5.2 Client utilization data (select participating programs)

The groups that chose to provide drive data that included anonymized client data had cumulatively included 3286 unique drives that served 421 recorded clients.

Table 4 Volunteer Driver Programs Usage per Client for select participating groups

Number of annual Drives per client	Percentage	Cumulative Percentage
1-10	73%	73%
11-20	14%	86%
21-30	6%	93%
31-40	2%	95%
41-50	2%	97%
>50	3%	100%

One caveat of these data is that some VDPs only associate a drive with a single client, even if drives were provided to multiple clients. This was a rare occurrence, but does mean that the numbers in Table 4 above may not be exact, though expected to be in the correct order of magnitude.

5.3 Stops per drive (one program)

The data in Table 5 were recorded by a single program within the participating groups. This VDP collected total number of stops per drive and observed 2 stops per drive (likely a return home) most of the time, with no drive having more than 6 stops. Approximately 20% of all drives had between 3 and 4 stops, which was a notable finding since most other groups only recorded one trip purpose per drive when it was likely more stops were occurring.

Table 5 Distribution of Number of Stops per Drive for one operator

Number of Stops per Drive	Percentage	Cumulative Percentage
1	9.4%	9.4%
2	68.0%	77.5%
3	13.2%	90.6%
4	6.7%	97.3%
5	2.6%	99.9%
6	0.1%	100.0%

6 Conclusions and next steps

An in-depth review of the data collection practices of five VDP in New Brunswick found that all had some measure of data collection, but were using different or inconsistent definitions for collecting drive information, including trip purposes, number of stops, and client information. This made it difficult to combine group statistics to determine the aggregate impact of these programs on helping New Brunswickers meet their transportation needs. Some of the major initial findings:

- The data collected by groups can be categorized into two types, drive data and user data, though the details collected on each drive and user vary among groups;
- Over 400 individuals rely on the 5 programs profiled, using the services on average for 8 drives per year supported by over 80 volunteer drivers;
- "Health" drives accounted for more than half of all drives provided, had the lowest numbers of passengers per drive, and longest average drive distance of known trip types;
- The group who recorded stop data found that 78% of drives had two or fewer stops; nearly 20% of drives had between 3 and 4 stops.

The participating VDPs have made positive strides towards developing a common data collection standard and have agreed, along with two new programs, to use a spreadsheet template for collecting data for calendar year 2017. The columns of the spreadsheet are as follows:

- Drive # (unique drive identifier);
- Reference Drive # (if the Drive depended on a previous drive);
- Date (in dd-mm-yy format);
- Pick up time (to nearest 15 min in 24 hr time);
- Member (unique member identifier number for all who took the drive);
- Number of users;
- Escort (number of passengers who are escorting the users);
- Volunteer (unique identifier number for the volunteer driver);
- Volunteer Time (total time spent by volunteer including drive time and waiting, to nearest 15 min);
- Trip purposes (Health, Work or Education, Life Maintenance, Quality of Life, Return Home);
  - Total number of physical stops made to complete each trip purpose
  - If one physical stop has two purposes, it should be recorded as 0.5 stops for each purpose
- Length (distance of the drive in km).

Ridership will likely increase as the operation of the newer groups mature and more people become aware of the services. The current data sources provide some insight into operations and the important role these programs play in supporting the transportation of New Brunswickers, but better data are needed to refine estimates. It is hoped that the approach outlined here will permit a broader understanding of the use of operational aspects of these programs (from a transportation systems perspective). Over time, there is a need to better understand the travel behaviour of program users in terms of their choice to use this program when compared to other options (if such options exist) in order to better predict where programs may be successful and what they may expect for ridership.

7   Acknowledgements

8   References

Beverly Foundation (2004). *Supplemental Transportation Programs for Seniors a Report on STPs in America.*

Federation of Canadian Municipalities (FCM) (2011). *Canada's Aging Population The municipal role in Canada's demographic shift.* Federation of Canadian Municipalities, 24 Clarence St. Ottawa, Ontario.

Hanson, T. R. & Cassie, D. (2016) *Enabling and Measuring Success Among New Brunswick Volunteer Driver Programs in an Era of Demographic Change: Towards a Common Data Collection Standard.* Proceedings of the 51st Annual Conference, Canadian Transportation Research Forum.

Hanson, T. R. (2014). *Planning for Future Successes Among Rural Volunteer Driver Programs: Understanding Local Preferences of Prospective Users and Drivers.* Paper presented at the Transportation Research Board 93rd Annual Meeting.

Hanson, T. R., & Hildebrand, E. D. (2011). *Can rural older drivers meet their needs without a car? Stated adaptation responses from a GPS travel diary survey*. Transportation, 38(6), 975-992.

Hanson, T.R. (2009). Transportation alternatives for rural seniors in New Brunswick, Canada: Issues, policy implications and research needs. In Proceedings of the Transp. Res. Board 88th Annual Meeting, on compact-disc, Washington DC (2009a).