

Rural Travel Around an Urban Area: Completing the Picture of Travel

David Kriger, P.Eng., MCIP, David Kriger Consultants Inc., Ottawa

Ahmad Subhani, P.Eng., Senior Project Manager, City of Ottawa, Ottawa

and

Andreas Rose, Project Manager, R.A. Malatest & Associates Ltd., Victoria

Paper prepared for presentation at the
“Best Practices in Transportation Planning” Session
of the 2012 Annual Conference of the
Transportation Association of Canada

Fredericton, New Brunswick

March 2012

ABSTRACT

Urban areas across Canada must keep track of changing travel trends. This helps them to prioritize scarce transportation infrastructure investment dollars to meet both existing and emerging trends.

As the country's urban areas have grown, so too have the rural populations surrounding these centres. Recent urban household travel surveys have tended to include this 'hinterland,' including surveys in Montréal, Ottawa-Gatineau, the Greater Toronto-Hamilton Area and Winnipeg. Naturally, the analytical and model development processes have focused on the dominant urban activity whose attributes tend to mask those associated with the surrounding rural areas. However, the characteristics of urban and rural travel differ; and although rural travel is much smaller it does represent a potential new market for sustainable transportation initiatives that are focused on the urban centre. Moreover, the rural 'rings' often provide a transition in travel between inter-urban corridors and the urban centres – hence regional planning also is impacted. Finally, there is interest in maintaining the character of rural communities and environments in their own rights, which again requires distinct transportation (and other) treatments. As a result, there is a need to understand better these distinct characteristics.

Recent travel surveys in the Ottawa-Gatineau area – the National Capital Region, or NCR – provide an opportunity to examine more completely the distinct nature of rural travel. This paper analyzes the 2005 region-wide household origin-destination survey, which also included the rural portions of the NCR. It also considers the 2009 external cordon roadside intercept survey, which looked at travel beyond these rural portions.

Together, the two surveys provide insight into the 'complete picture' of travel behaviour in and around the NCR, while also accounting for the differences noted above. That is the subject of the paper, which compares travel characteristics for the different 'markets' (internal and external, urban and rural, sub-region and total region). These characteristics include trip rates, mode shares, trip purposes, demographics and the like. The paper also discusses aspects of the surveys and their conduct.

1. INTRODUCTION

1.1 Objectives

This paper examines rural travel in a major Canadian urban area, and differentiates and compares these with the dominant urban / suburban travel characteristics.

The National Capital Region (NCR) comprises the cities of Ottawa, Ontario and Gatineau, Québec. The NCR's combined population of around 1.2 million places it among the largest urban areas in the country, but not among the 'Big Three' of Toronto, Montréal or Vancouver. Moreover, the NCR has characteristics that are associated with smaller urban areas: The two cities are well integrated economically and demographically but - because they are physically separated by the Ottawa River (i.e., they are not contiguous), and serve different catchment areas and economies - they exhibit some different sub-characteristics. As well, "90% of the NCR's population is concentrated on 10% of the area" (roughly speaking) and there is a significant rural travel component beyond the NCR's boundaries that is focused on the urban centre. These focuses traditionally have been related to jobs and schools; however, other

attractions, such as medical appointments and entertainment, also beckon. These aspects are shared by many urban areas, larger and smaller, in Canada.

Although the rural component of urban travel is small, as urban congestion grows in the face of ever-scarcer transportation investment funds, there is a need to consider all potential travel 'markets' with greater scrutiny. This is true even for urban areas such as the NCR, which generally have well developed, successful public transit systems that include routes reaching out into their rural hinterlands. As well, from time to time sustainable transportation initiatives, such as commuter rail, have been proposed to link the outlying communities with the urban centre. Similarly, bypass or ring road initiatives have been proposed around many urban centres, primarily to alleviate urban congestion and permit more efficient through travel; clearly, however, such proposals also could impact rural accessibility. Moreover, quality of life considerations, housing prices and the desire of people to have ready access to urban attractions and services mean that these areas will continue to grow over time. Finally, there is a desire to maintain the rural characteristics and natural features of the rural lands surrounding urban areas: All told, there is a need to better understand the travel behaviour associated with these rural rings.

The National Capital Region provides an opportunity to enhance this understanding. Several travel surveys have been conducted in the NCR over the last several years. These are administered by TRANS, which is a multi-agency committee responsible for travel surveys, data collection, travel demand modelling and technical studies for the NCR. TRANS is made up of the cities of Ottawa and Gatineau, the two regional transit operators (OC Transpo and the Société de transport de l'Outaouais), the ministries of transportation of Ontario and Québec, and the federal government's National Capital Commission. (See <http://www.ncr-trans-rcn.ca> for more information.)

This paper differentiates rural and urban / suburban travel characteristics, using two surveys: the 2005 region-wide household travel survey, which included the rural districts of the NCR;¹ and the 2009 external cordon roadside / mailback survey, which was conducted at a cordon surrounding the NCR.

Although it does not replace modelling as the analytical basis for transportation planning, an examination of surveys and other 'observed' characteristics provides both a means to vet and validate the model and a reference against which to assess forecasts. To this end, TRANS recently examined travel trends over a 20-year period, to identify emerging trends and also consider their implications on future travel.² The results are being used to inform TRANS' forecasts and also to assess progress towards its member agencies' sustainable transportation goals for the NCR.

1.2 Organization of paper

The remainder of the paper has four main sections. Section 2 describes the study area and the two surveys. Section 3 presents key demographic and travel characteristics from the 2005 household survey, and draws out the rural characteristics. Section 4 considers the 2009 external cordon survey. Section 5 concludes the paper, and identifies possible

¹ A new region-wide household survey was conducted in autumn 2011. However, the results were not yet available at the time of this writing.

² See *National Capital Region Travel Trend Study*, Part 1 and Parts 2 and 3, 2011. Available at www.ncr-trans-rcn.ca.

areas for further research.

2. DESCRIPTION OF THE SURVEYS

2.1 Study area

Figure 1 depicts the study area. The area is bisected by the Ottawa River. South of the river, in Ontario, the study area comprises the City of Ottawa. North of the river, in Québec, the study area comprises the City of Gatineau and the Municipalité régionale de comté des Collines de l'Outaouais, which essentially surrounds Gatineau. The area approximates but is not strictly contiguous with, the defined boundaries of the National Capital Region.

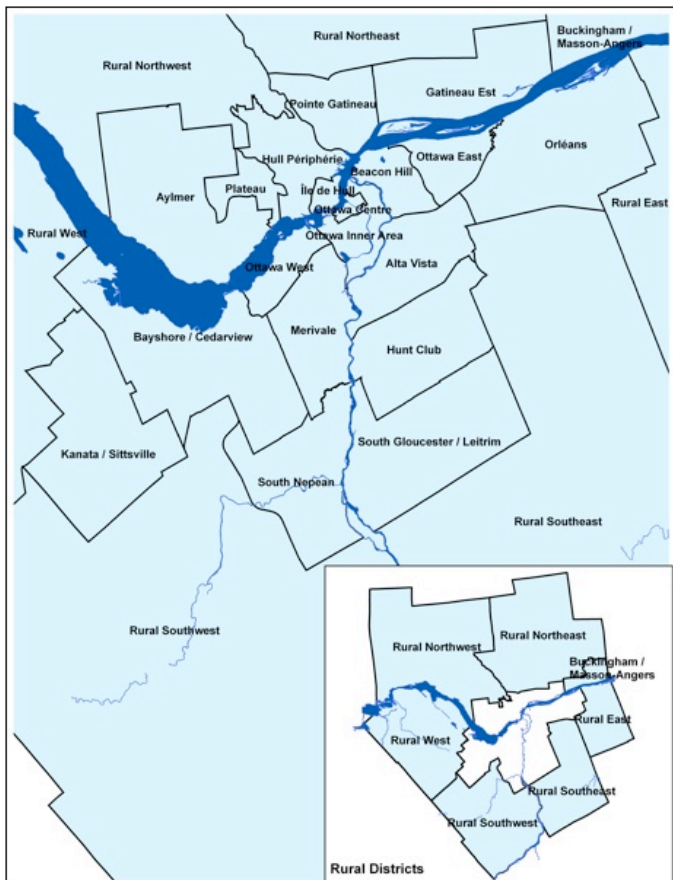


Figure 1. Urban / suburban and rural districts

2.2 2005 Household survey

The 2005 household survey was conducted as a computer-aided telephone interview in autumn 2005. Data were captured for 23,900 randomly sampled households, sampled across 26 districts, representing 5.1% of all households in the survey area overall. The districts are shown in the figure. The interview covered the sampled household's trips over a 24-hour weekday for all household members aged 11 and older. Typical of household surveys, the survey captured information at three levels:

- **Household:** location, size (number of occupants), number of vehicles and

dwelling unit type.

- **Person:** age, gender, occupation, usual place of work or school (if applicable), and three traveller attributes (driver's license, transit pass and whether or not the person telecommuted on the survey date).
- **Trip:** origin, destination, purpose, mode(s) of travel, departure time, transit access mode and transfer points (if applicable), and whether an Ottawa River bridge was used. (1)

The 2011 survey followed a similar format, with some specific additional questions.

2.3 2009 External cordon survey

The 2009 cordon survey captured travel on 23 roads and highways leading into and out of the NCR. The locations are shown in Figure 2. Roadside intercept surveys were conducted on 18 roads and arterial highways, where traffic volumes and road alignments allowed vehicles to be pulled over safely to the side of the road. At five access controlled divided highways, license plate numbers were recorded and a mailback survey subsequently was sent to the vehicle's registered owner. Surveys were conducted on weekdays in the spring and summer of 2009, capturing traffic over an 11-hour period at each location. In total, 17,744 valid surveys were completed, representing 13.3% of all traffic passing through the survey sites.

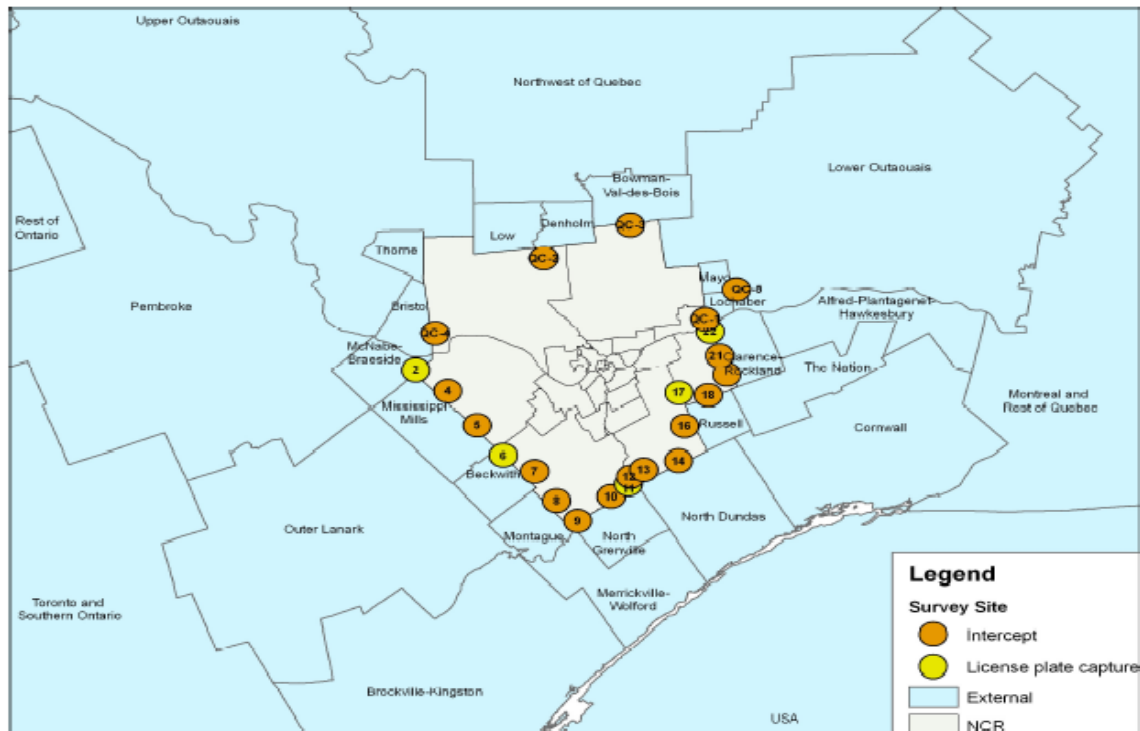


Figure 2. External Cordon Survey locations (2009)

The surveys captured information specific to the individual trip passing through the survey site:

- Origin and departure time from origin
- Destination and expected arrival time at destination
- Trip purpose
- Use of park-and-ride facility as part of this trip
- Occurrence of a trip in the opposite direction on the same route that day, and the time of that trip
- Frequency with which the trip is made

The survey also recorded the license plate number and issuing province or state; the vehicle type (personal and commercial vehicles were surveyed), and the total numbers of occupants in the vehicle. (2)

3. COMPARISON OF URBAN AND RURAL CHARACTERISTICS – 2005 SURVEY

This section draws on the results of the 2005 household survey, to compare rural and urban / suburban demographic characteristics (section 3.1) and travel characteristics (section 3.2).

3.1 Urban and rural characteristics - demographic

For the purposes of this analysis, the 26 TRANS districts were divided into two sub groups: the 19 urban / suburban districts and the 7 rural districts, as shown in Figure 1.

The demographic characteristics of the urban/suburban and rural districts are summarized in tables 1 – 8, and are compared below. (Note that this discussion is based upon the 2005 survey.) Key points to note:

Population. Table 1 indicates that the rural districts are home to 1 in 7 of the NCR’s residents. These districts have a slightly younger population than the urban/suburban districts.

Table 1. Population (2005)

	Total population		Population 11+		11+ as % of total %
	Total	%	Total	%	
Total urban/suburban	996,990	87%	874,180	87%	88%
Total rural	153,580	13%	131,340	13%	86%
Total NCR	1,150,570	100%	1,005,520	100%	87%

Households. The rural proportion of households is slightly less than that of the residential proportion (see Table 2). However, as Table 3 indicates, the average household size is 14% larger in the rural districts (2.76 v. 2.43 people per household). The proportion of rural 1 person households is about half that of the urban/suburban districts. The rural proportion of 2 and 3 person households is about the same as that of the population (1 in 7), while 4 and 5+ person households are in slightly greater proportion.

Employees. Table 4 profiles workers and jobs. The rural proportion of employed residents (workers) is about the same as the population (1 in 7). However, the rural proportion of jobs is significant smaller, about 1 in 20: this means that there are local jobs only for about 1 in 3 rural employees, and the rest must commute to suburban/urban jobs (or jobs outside the NCR).

There are more jobs in the urban / suburban districts (589,810 in 2005) than there are employees who live these districts and in the NCR as a whole (543,290 workers).

Table 2. Households (2005)

	Total		Average hhd size *
	No. hhlds	%	
Total urban/suburban	409,690	88%	2.43
Total rural	55,680	12%	2.76
Total NCR	465,370	100%	2.47

* Calculated as a function of total population.

Table 3. Household size (2005)

	1 person	2 persons	3 persons	4 persons	5+ persons	All
Total urban / suburban	93%	87%	87%	85%	83%	88%
Total rural	7%	13%	13%	15%	17%	12%
Total NCR	100%	100%	100%	100%	100%	100%

Table 4. Employees (workers) and jobs (2005)

	Total employees *		Total jobs		Jobs / empl	Empl / pop **	Jobs / pop **
	Total	%	Total	%			
Total urban/suburban	468,750	86%	589,810	96%	1.26	0.54	0.67
Total rural	74,540	14%	26,930	4%	0.36	0.57	0.21
Total NCR	543,290	100%	616,740	100%	1.14	0.54	0.61

* Full time and part time workers

** Calculated as function of population 11+ years

Vehicle availability. Table 5 indicates that the urban/suburban – rural vehicle populations are in proportion, approximately, to the population, household and worker proportions. However, as Table 6 and Table 7 indicate, the proportions of 0- and 1-vehicle households are significantly lower in the rural areas, while the higher-vehicle households are much greater – 1/4 of 3-vehicle households and 40% of 4+ -vehicle households. Just under half (47%) of urban/suburban households have 1 vehicle, whereas just over half (54%) of the rural households have 2 vehicles.

Table 5. Vehicle availability (2005)

	Total		Average veh / person *	Average veh / FT empl	Average veh / hhd **
	No. veh.	%			
Total urban/suburban	545,820	83%	0.62	1.27	1.33
Total rural	111,640	17%	0.85	1.64	1.97
Total NCR	657,460	100%	0.65	1.32	1.41

* Population 11+.

** Weighted average, calculated from sum of 5 vehicle/household categories (0, 1, 2, 3, 4+). For this calculation, the 4+ vehicles category is set equal to 4 vehicles.

Moreover, the rural vehicle availability rates per person, full-time employee and household are all significantly higher than those of the urban/suburban districts, at 33%, 29% and 50%, respectively (see Table 5).

Table 6. Households by vehicle availability (2005)

	0 vehicles	1 vehicle	2 vehicles	3 vehicles	4+ vehicles	All
Total urban / suburban	56,200	192,820	134,450	20,740	5,100	409,710

Total rural	790	14,100	29,800	7,810	3,200	55,700
Total NCR	57,390	206,920	164,250	28,550	8,300	465,410

Table 7. Households by vehicle availability – distribution (2005)

	0 vehicles	1 vehicle	2 vehicles	3 vehicles	4+ vehicles	All
Total urban / suburban	99%	93%	82%	73%	61%	88%
Total rural	1%	7%	18%	27%	39%	12%
Total NCR	100%	100%	100%	100%	100%	100%

Traveller characteristics. Table 8 indicates that the 1 in 7 rural proportion of licensed drivers and of telecommuters is maintained. However, not surprisingly, fewer than 1 in 20 rural residents hold transit passes.

Table 8. Traveller characteristics (2005)

	Licensed Drivers		Transit Pass Holders		Telecommuters	
	Number	%	Number	%	Number	%
Total urban / suburban	681,340	86%	175,250	96%	44,630	85%
Total rural	110,230	14%	6,450	4%	7,660	15%
Total NCR	791,570	100%	181,700	100%	52,290	100%

3.2 Urban and rural characteristics - travel

Trip rates. Table 9 summarizes the daily trip rates per person (11+ years) and per household. Although the rural person-trip rate is lower than that the corresponding urban/suburban trip rates, the higher rural household size means that the overall household trip rates are about the same. This is important because – although travel demand forecasting models traditionally have estimated trips as a function of individuals – newer models now recognize the linkage in travel activity among members of a household and some models now estimate trips on a household basis. (For example, two spouses may share a ride together to their respective workplaces – meaning that mode choice is not strictly a function of vehicle availability.)

Table 9. Trip rates (2005)

	Trips / person *	Trips / household
Total urban/suburban	2.79	5.95
Total rural	2.51	5.91
Total NCR	2.75	5.95

* Population 11+ years.

Trip purpose. Table 10 breaks down trips by purpose, for the 24 hour period, AM peak period (0630 – 0859) and PM peak period (1530 – 1759). It should be noted that these data are presented by trip *origin* and only for trips that are destined within the NCR.

Table 10. Distribution of trip purposes (by origin / destination within NCR – 2005)

24 hour	Total urban		Total rural		Total NCR	
	No. trips	% NCR	No. trips	% NCR	No. trips	% NCR
Work or related	474,460	19%	60,450	27%	534,910	19%
School	165,200	6%	23,560	11%	188,760	7%
Shopping	257,180	10%	18,430	8%	275,610	10%
Pick up / drop off	164,040	6%	15,310	7%	179,350	6%
Return home	1,084,430	43%	66,060	30%	1,150,490	42%
Personal and other	401,000	16%	38,400	17%	439,400	16%
Total	2,546,310	100%	222,210	100%	2,768,520	100%

AM peak period	Total urban		Total rural		Total NCR	
	No. trips	% NCR	No. trips	% NCR	No. trips	% NCR
Work or related	280,120	55%	36,330	53%	316,450	55%
School	117,920	23%	20,800	30%	138,720	24%
Shopping	6,340	1%	950	1%	7,290	1%
Pick up / drop off	47,810	9%	5,890	9%	53,700	9%
Return home	19,700	4%	1,320	2%	21,020	4%
Personal and other	33,890	7%	3,700	5%	37,590	7%
Total	505,780	100%	68,990	100%	574,770	100%

PM peak period	Total urban		Total rural		Total NCR	
	No. trips	% NCR	No. trips	% NCR	No. trips	% NCR
Work or related	19,760	3%	1,740	5%	21,500	3%
School	5,330	1%	240	1%	5,570	1%
Shopping	52,610	9%	2,880	8%	55,490	9%
Pick up / drop off	46,230	8%	3,400	9%	49,630	8%
Return home	410,340	67%	22,510	60%	432,850	67%
Personal and other	75,010	12%	6,720	18%	81,730	13%
Total	609,280	100%	37,490	100%	646,770	100%

Several observations can be made:

- For the urban/suburban districts, on a 24-hour basis, the 'return home' trip dominates, representing almost half (43%) of all trips – more than double the next highest categories: 'work or related' (19%) and 'personal and other' (16%). In contrast, the 'return home' category (30%) is only slightly greater than the 'work or related' category (27%); and school trips are almost double the urban/suburban proportion (11% v. 6%).
- The profiles are most similar during the AM peak period, which is dominated by non-discretionary work and school commutes. 'Work or related' trips comprised over half of all trips – 55% for urban/suburban districts and 53% for rural districts. 'School' trips represented 23% and 30%, respectively.
- A similar profile exists for the PM peak period, with the 'return home' trip dominating (67% for urban/suburban districts and 60% for rural districts). The next largest category is 'personal and other', at 12% and 18% respectively: meaning that the combination of the two purposes has the same proportions for both groups.

In sum, the profiles for urban/suburban and rural districts are most similar for non-discretionary trips (work and school commutes) during the commuter peak periods but vary considerably for discretionary trips and for times outside the peaks.

Trip distribution / internalization. At the same time, the rural districts have a lower rate of internalization (self-containment of trips) than do the urban / suburban districts. This is consistent with expectations, given the dominance of the latter; and it is evidenced by Table 11, which summarizes trip rates, and by Table 12, which shows the distribution of trips.

Table 11. Trip origin rates (NCR destinations – 2005)

24 hour	Trips/person	Trips/pers11+	Trips/hhld
Total urban / suburban	2.55	2.91	6.22
Total rural	1.45	1.69	3.99
Total NCR	2.41	2.75	5.95

AM peak period	Trips/person	Trips/pers11+	Trips/hhld
Total urban / suburban	0.51	0.58	1.23
Total rural	0.45	0.53	1.24
Total NCR	0.50	0.57	1.24

PM peak period	Trips/person	Trips/pers11+	Trips/hhld
Total urban / suburban	0.61	0.70	1.49
Total rural	0.24	0.29	0.67
Total NCR	0.56	0.64	1.39

Table 12. Trip distribution (2005)

24 hour	Total urban / suburban		Total rural		Total NCR	
	Trips	%	Trips	%	Trips	%
Total urban / suburban	2,415,400	87%	131,800	5%	2,547,200	92%
Total rural	132,500	5%	90,300	3%	222,800	8%
Total NCR	2,547,900	92%	222,100	8%	2,770,000	100%

AM peak period	Total urban / suburban		Total rural		Total NCR	
	Trips	%	Trips	%	Trips	%
Total urban / suburban	492,900	86%	11,200	2%	504,100	88%
Total rural	49,700	9%	19,900	3%	69,600	12%
Total NCR	542,600	95%	31,100	5%	573,700	100%

PM peak period	Total urban / suburban		Total rural		Total NCR	
	Trips	%	Trips	%	Trips	%
Total urban / suburban	561,700	87%	47,000	7%	608,700	94%
Total rural	17,900	3%	18,400	3%	36,300	6%
Total NCR	579,600	90%	65,400	10%	645,000	100%

The ensuing text explains further:

- It was noted that Table 10 summarizes trips by their district of origin, and includes only trips that were destined within the NCR. Table 11 derives the resultant trip *origin* rates for the urban / suburban and rural districts. For the 24-

hour period, it can be seen that the (dominant) urban / suburban rates are fairly close (in fact, seemingly exceed³) the overall trip rates shown in Table 9. However, the rural trip rates are significantly lower, by any measure: in other words, significant trip-making activity for rural residents is made outside their district; that is, in the urban / suburban centre. For example, a rural commuter who works in an urban / suburban district will make a shopping trip closer to the place of work than to the home district. In turn, this differentiates the trip chaining characteristics of the two sets of districts, as well as mode choice (i.e., this suggests that the rural commuter is most likely to drive, even if presented with a park-and-ride option). Note also that the 'missing' trips could also represent trips destined to rural areas outside the NCR, although the proportion of these is not known.

This is especially apparent during the PM peak period, in which the originating trip generation rate of rural districts is about 1/3 that of the urban / suburban districts. On the other hand, the AM peak period rates are close to each other; consistent with expectations associated with the predominant work and school commutes.

- As can be seen in Table 12, the rural districts have a lower internalization rate than do the urban / suburban districts: this is consistent with expectations; that is, that the urban centre serves as an attractor for rural residents. The proportion of internal trips in the (dominant) urban / suburban districts – 87% of all NCR trips – is consistent with the proportions of population, households and jobs. On the other hand, rural residents must commute longer distances to and from the urban / suburban districts.

This is important because the survey indicates that travel activity by rural residents, and the resultant trip chains, differ from those of their urban / suburban counterparts. On the one hand, these represent only a small minority of trips (and people, households and workers); but on the other hand, they represent a distinct travel 'market' whose activities must be treated separately in modelling and planning.

Mode share. Table 13 summarizes the mode share, again by trip *origins* for trips destined within the NCR.

Key points to note:

- The dominance of the auto driver mode – always at least 50% of urban / suburban trips – is accentuated among rural origins, with a 68% daily share. The auto passenger shares are almost the same in the two groups.

³ The distinction between the two sets of rates is important. Table 9 represents trips generated by residents of a particular district, regardless of the district in which the trips are actually made. This is the 'true' representation of trip generation rates. Table 11 categorizes the trips by the district in which they originate, and then relates these trips to the population or households of the given zone: this is *not* a true trip generation rate, but it is presented here because it indicates, at a high level, in which of the two district groups activities actually take place.

Table 13. Mode share (2005)

24 hour	Total urban / suburban		Total rural		Total NCR	
	No. trips	% share	No. trips	% share	No. trips	% share
Auto driver	1,445,200	57%	151,430	68%	1,596,630	58%
Auto passenger	336,150	13%	30,580	14%	366,730	13%
Public transit	356,210	14%	6,090	3%	362,300	13%
School bus	58,500	2%	23,100	10%	81,600	3%
Bicycle	35,780	1%	1,310	1%	37,090	1%
Walk	290,030	11%	8,440	4%	298,470	11%
Other	24,330	1%	1,300	1%	25,630	1%
Total	2,546,200	100%	222,250	100%	2,768,450	100%

AM peak period	Total urban / suburban		Total rural		Total NCR	
	No. trips	% share	No. trips	% share	No. trips	% share
Auto driver	254,920	50%	41,850	61%	296,770	52%
Auto passenger	54,200	11%	7,310	11%	61,510	11%
Public transit	108,350	21%	3,030	4%	111,380	19%
School bus	25,090	5%	14,660	21%	39,750	7%
Bicycle	9,070	2%	210	0%	9,280	2%
Walk	50,960	10%	1,500	2%	52,460	9%
Other	3,230	1%	400	1%	3,630	1%
Total	505,820	100%	68,960	100%	574,780	100%

PM peak period	Total urban / suburban		Total rural		Total NCR	
	No. trips	% share	No. trips	% share	No. trips	% share
Auto driver	343,440	56%	26,160	70%	369,600	57%
Auto passenger	73,670	12%	5,470	15%	79,140	12%
Public transit	102,480	17%	1,140	3%	103,620	16%
School bus	15,370	3%	2,620	7%	17,990	3%
Bicycle	9,630	2%	330	1%	9,960	2%
Walk	60,110	10%	1,590	4%	61,700	10%
Other	4,590	1%	220	1%	4,810	1%
Total	609,290	100%	37,530	100%	646,820	100%

- The public transit share is significantly lower for rural origins – of the order of 1/5 the share of the urban / suburban origins. On the other hand, the rural school bus share is significantly higher than that of the urban / suburban districts: this is consistent with the modes that are used to transport students in the respective districts. Of note, the combined public transit and school bus shares for the two groups generally approximate each other for the daily and AM peak periods (the PM rural shares are not indicative because they are origins).
- The urban / suburban walk share is significantly higher than its rural counterpart for all time periods. The urban / suburban bicycle share is similarly higher than the rural shares, although never exceeding 2% of the total. The 'other' mode shares generally are about the same.

4. COMPARISON OF URBAN, RURAL AND EXTERNAL CHARACTERISTICS – 2009 SURVEY

The 2005 and 2009 surveys are not directly comparable, in several ways: method, timing and – especially – [1] the external cordon survey captured a single trip, compared with the full day's activity captured in the household survey; [2] different time periods were covered; and [3] the cordon survey captures only vehicular travel. Nonetheless, some useful insights can be derived from the 2009 survey, insofar as rural and external trips are concerned.

Table 14 tabulates the origins and destinations for three geographies: urban / suburban districts and rural districts – both as per the 2005 tabulations – as well as external districts (that is, districts outside the NCR); all for the AM peak period. Table 15 provides the same tabulation for the PM peak period. Both tables depict vehicle-trips. In the AM, it can be seen that 2/3 (65%) of all trips are destined to the urban / suburban districts, consistent with expectations. A slightly lesser proportion (61%) is observed in the opposite direction during the PM peak period. Of interest, there is a small but still significant exchange of trips between rural and external districts in each direction: of the order of 8 – 10% in each of the two peak periods. There is a slightly greater proportion inbound (external to rural) in the AM peak period than in the opposite direction, and the reverse is true in the PM.

Table 14. AM peak period vehicle-trips – all (2009)

AM peak period – All	Urban / suburban	Rural	External	Total
Urban / suburban			5,580	5,580
Rural			2,470	2,470
External	20,340	2,780		23,120
Total	20,340	2,780	8,050	31,170

	Urban / suburban	Rural	External	Total
Urban / suburban			18%	18%
Rural			8%	8%
External	65%	9%		74%
Total	65%	9%	26%	100%

Table 15. PM peak period vehicle-trips – all (2009)

PM peak period – All	Urban / suburban	Rural	External	Total
Urban / suburban			21,820	21,820
Rural			3,520	3,520
External	7,590	2,890		10,480
Total	7,590	2,890	25,340	35,820

	Urban / suburban	Rural	External	Total
Urban / suburban			61%	61%
Rural			10%	10%
External	21%	8%		29%
Total	21%	8%	71%	100%

Table 16 and Table 17 similarly summarize work trips, for the AM and PM peak periods respectively. In the morning, these trips constitute 3/4 (75%) of all trips, although in the afternoon the proportion drops to 12%. The urban / suburban districts represent the dominant AM destination (72%) and PM origin (59%); however, the external – rural exchange still remains (6% - 11%). The point is that just as the urban / suburban districts remain the dominant destinations for rural and external commuters (and for other attractions), there is still a small but important exchange between the rural and external districts: in other words, the NCR's commutershed and 'activity-shed' extends beyond the urban / suburban districts and, in fact, beyond the NCR's boundaries.

Table 16. AM peak period vehicle-trips – work (2009)

AM pk pd - Work	Urban / suburban	Rural	External	Total
Urban / suburban			2,980	2,980
Rural			1,430	1,430
External	16,830	2,070		18,900
Total	16,830	2,070	4,410	23,310

	Urban / suburban	Rural	External	Total
Urban / suburban			13%	13%
Rural			6%	6%
External	72%	9%		81%
Total	72%	9%	19%	100%

Table 17. PM peak period vehicle-trips – work (2009)

PM pk pd - Work	Urban / suburban	Rural	External	Total
Urban / suburban			2,640	2,640
Rural			480	480
External	960	410		1,370
Total	960	410	3,120	4,490

	Urban / suburban	Rural	External	Total
Urban / suburban			59%	59%
Rural			11%	11%
External	21%	9%		31%
Total	21%	9%	69%	100%

5. SUMMARY THOUGHTS AND CONCLUSIONS

The comparison of surveys and the distinction between urban and rural travel is a first step in understanding how different travel markets behave around a major urban area. These data have been used to develop a travel demand forecasting model for the NCR; and it makes sense that the model focuses on the dominant urban travel. However, although rural travel is small in both absolute and relative terms, the results of this comparison clearly indicate some commonalities – for example, in the proportions of licensed drivers and of telecommuters – but also several important differences. Rural districts feature:

- Larger households with more vehicles.
- Slightly lower person-trip rates, which – with a larger average household size – translate into approximately the same household trip rates.
- A higher tendency to auto use, which is consistent with higher average vehicle

availability. Although public transit use is much lower than in the urban / suburban districts, there is evidence of a substitution of public transit for school buses.

- Focus for work and school commutes into the urban / suburban districts; and – as important – evidence that many other activities in the rural trip chain take place in the urban / suburban districts as opposed to the home district.
- Some evidence that the next ‘rural ring’ (external trips) behaves in similar ways to the NCR rural districts, in that the urban / suburban districts are the focus of this broader commutershed / activity-shed. Also noteworthy is that there remains, nonetheless, a small but significant exchange of trips between the rural and external districts. In other words, rural travel that is centered about the Ottawa-Gatineau region is not necessarily tied to the region’s administrative boundaries.

Several caveats regarding the comparability of the two surveys have been noted above. Nonetheless, together they provide evidence of the existence of a different travel market outside the main urban / suburban centres, whose characteristics are of sufficient difference and magnitude that they merit special attention.

Despite the small magnitudes and the basis of this activity at the periphery of the urban centre, the differentiation of rural travel is important to understand, for several reasons:

- Urban transportation solutions may have to be adapted or extended to accommodate rural needs. For example, rural / external commuters comprise a significant portion of Ottawa’s well-established and well-used park and ride network.
- It is common for long-range transportation plans to be based upon a range of measures, large and small, which individually address specific travel ‘markets’ but in combination are aimed at achieving overarching goals, such as increasing sustainable transportation choices. For example, Ottawa’s park and ride lots provide a means to mitigate road congestion closer to the central area.
- As noted, inter-urban corridors and bypasses impact the rural / external districts; and so their potential use by rural / external travellers must be understood in any potential plans or improvements.
- Travel within rural / external areas also must be understood, in order to address local needs. For example, it is well known that the lack of alternatives forces elderly rural drivers to continue to drive - for example, to go to medical appointments - even if physical or other impairments raise potential safety concerns. In some areas, increased localized development is occurring, as a function of lower land prices, the desirability of people to live in a rural environment, and the development of cottage properties (and recreational travel is also not well understood).
- There is accordingly a resultant need to model more accurately this different travel ‘market,’ in all aspects from trip generation rates (which, as noted, increasingly are based on household rather than individual characteristics) to trip distribution and mode choice.

This analysis establishes a basis for the differentiation and describes several aspects of it. However, going forward, additional analysis could be helpful, in order to allow for a more detailed depiction of the differences – in particular, relating travel choices, origins and destinations more specifically to individual household characteristics.

6. ACKNOWLEDGEMENTS

Appreciation is expressed to the City of Ottawa, which prepared special tabulations for this paper. These special tabulations were developed from the databases of the 2005 National Capital Area Transportation Survey and the 2009 External Cordon Survey. Both surveys were conducted and summarized by R.A. Malatest and Associates Ltd. in association with iTRANS Consulting (now HDR Inc.).

The views expressed in this paper do not necessarily reflect the official positions of TRANS or its constituent agencies.

7. REFERENCES

- (1) *2005 Origin-Destination Survey, Summary of Results*, prepared by iTRANS Consulting Inc. for the TRANS Committee, December 2006.
- (2) *National Capital Region 2009 External Travel Survey – Final Report*, prepared by HDR | iTRANS Consulting Inc. for R.A. Malatest and Associates Ltd., on behalf of the TRANS Committee, June 2010.