

Rural-Urban Contrasts in Activities and Travel Behavior: Preliminary Results from the Halifax STAR Project.

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Abstract

Key concepts and empirical findings on time use produced over the last 40 years are overwhelmingly oriented to urban milieux, and there has been insufficient attention to rural areas. This paper considers variations in time allocation and travel behavior along the entire urban-rural continuum, using the four components of inner city, suburbs, commuter belt, and remote rural areas. Particularly beyond the commuter belt, rural areas suffer from low densities of population and services, lack of public transportation, and long distances for most types of journey. However, road traffic is light, rush-hour barely exists, and many farmers or fishers live at or close to their job.

An extensive survey of personal space-time activity is currently underway for the regional municipality of Halifax, Nova Scotia. This large region encompasses suburban, exurban, and remote rural districts, and the study's geo-referenced time-use data allow for detailed analysis of rural-urban contrasts. Preliminary aggregated results are presented and tested for significance. Many inter-zonal differences are revealed, some of which were unexpected.

Introduction: the Rural-Urban Continuum

Empirical work on time use and time geography has focused almost entirely on urban or suburban time behaviors. Research with a specific rural focus has been scarce, and is typically concerned with agricultural and village life in developing nations. There has been very little work on rural-urban contrasts in time use, or patterns of space-time activity. Until recently, most large time-use databases lacked coding for respondent geography, particularly for community size, and for degree of rurality.

Degree of rurality, or conversely of urbanization, is seldom considered as an explanation for inter-personal, inter-settlement, or inter-regional differences in time use, primarily because major time use surveys are either for a single urban area, or are national samples lacking rural-urban coding of respondents. One exception is work by Tillberg Mattson (2002), who studied rural-urban differences in children's leisure time, and in parental chauffeuring activity. Other exceptions are Canada-wide studies by Harvey (1994) and Millward (in press), using data from the 1986 and 2005 GSSC-TU respectively.

Urbanists have defined the city in many ways (see Mayer 1971, Bourne and Simmons 1982), but the main approaches to delimitation are political (incorporated towns and cities), physical (urbanized or built-up area), and socio-economic (the zone of economic dependency). Political boundaries seldom accord with the contiguous built-up area, or with the spatial extent of urban

land uses. Piecemeal, low-density sprawl often extends well beyond the city limits into the rural-urban fringe (Pryor 1968, Bryant et al. 1982, 2000), with impacts on land value and land use often preceding actual development (Harvey and Clark 1965, Miron 2000, Theobald 2001).

Traditionally, rural and urban ways of life were quite distinct. Widespread use of automobiles, however, extended urban commuting fields (a.k.a. 'daily urban systems' or labor market areas) well beyond the built-up area, and greatly altered socio-economic characteristics within this 'urban field' (Friedmann and Miller 1965). The limit of this commuter zone is typically suggested as around one hour's drive from major urban employment nodes, which underlines the importance of time use in the structure of modern rural areas. Large-lot housing development can significantly alter the landscape and social character of the more intensively exurbanized portions of the commuter belt (Dahms 1998, Millward 2000).

Pryor (1968), Bourne and Simmons (1982), Robinson (1990, particularly ch. 2), and Bryant et al. (2000) all provide useful discussions of the urban impact on the countryside and on rural ways of life. They agree with Pahl (1966) that there exists a 'rural-urban continuum', such that a simple urban/rural dichotomy is seldom useful or appropriate. They see utility in retaining the term rural, but defining differing degrees of rurality based on social, economic, demographic, and land use criteria (Cloke 1977, Harrington and Donoghue 1998).

Most national census bureaux see utility in defining urban areas of larger cities based on both the urbanized (built-up) area and the commuting (labor market) area (e.g., Bourne and Simmons 1982, Slifkin et al. 2004). Urbanized area is usually defined as a contiguous area exceeding a population density threshold (e.g. 400 / km² in Canada), while the commuter-shed is a contiguous area within which a large proportion of the employed labor force commute to the central urbanized core (e.g. over 50% in Canada). Typically, the labor markets so defined must have a minimum population in the urban core. In Canada, a census metropolitan area (CMA) has a core population of at least 100,000, while census agglomerations (CA's) have core populations between 10,000 and 100,000. In his 1994 time use study, Harvey employed a 3-way geographical categorization of metropolitan areas (CMA's), larger towns (CA's), and rural/small town (all other areas, RST), while Millward (in press) used the simpler publicly-available categorization of 'urban' (metropolitan areas and larger towns) versus 'rural' (RST).

The present paper divides the rural-urban continuum into four categories, labeled inner-city, suburban, commuter-belt, and remote rural. This allows a more realistic and theoretically satisfactory analysis than a simple urban/rural dichotomy, and should yield considerable insight into lifestyle differences in a range of locational settings. It is likely to be particularly useful for modelling and calibrating travel behavior, for purposes of transport planning.

Time Use Related to Degree of Rurality

From the time-use perspective, degree of rurality is likely to be important in two main ways. One is the land/life linkage, and the second is accessibility. The land/life linkage was traditionally fundamental to the settlement and maintenance of rural communities. It tied people to the resources of the land or sea, as farmers or fishers (and locally too as foresters or miners), and restricted them to highly localized activity spaces.

Restructuring in the resource industries (Healey and Ilbery 1985, Bowler 1992), has greatly attenuated the land/life link in all rural areas, but resource industries often remain important, relative to the remnant population, in remote areas beyond commuting range of cities. In Paul Cloke's index of rurality such areas are termed 'extreme rural' (Cloke 1977). They have higher unemployment (Wimberley 1993), are typically in demographic decline (Pacione 1982, Millward 2005), and thus have a higher dependency ratio and lower workforce participation (Robinson 1990, 59-92, Furuseth 1998). They should show less time overall in paid work, and more time at home. The range of activity settings within easy travel range is often very limited in remote rural settings (Furuseth 1998).

For journeys to shop and socialize, the dispersed nature of rural opportunities should be reflected in much longer journey distances than in the city, but individual journey times may be only moderately greater, since travel speeds are higher. As a response to longer distances, we might also expect the frequency of discretionary trips to be less in the country, so that total distances traveled are similar to urban levels. The rural journey-to-school, however, is non-discretionary, and should definitely be longer in distance and duration than the urban one.

Travel mode is an important consideration bearing on space-time activity. In urban areas, dense concentrations of people, employment, and services promote walking and bicycling (active transportation), and the provision and use of public transit. In rural North America, alternatives to the car are seldom available (Rucker 1984). Lack of public transit, however, may actually reduce average journey times, bringing them close to those in the city, while also reducing the overall number of journeys.

The Halifax STAR Project

Though they shed much light on time use in rural areas outside major labor markets, the studies by Harvey (1994) and Millward (in press) treat urban labor markets (commuter sheds) as single entities. Such mapping treats much of Canada's settled landscape, most of the rural-urban continuum, and 80% of the population as 'urban', yet these supposedly urban areas contain far more farmland and forest than urban development, and much of it would appear rural to the lay person. Certainly, too, most residents of exurban commuter belts would consider themselves rural, even when they work in town (Walker 2003, Paquette and Domon 2003).

This study employs data from the STAR project, which pertains to the county-sized municipality of Halifax, Nova Scotia. The STAR (Space-Time Activity Research) project is an innovative survey of both time use and travel activity, which employs GPS tracking to geo-reference respondent locations throughout a 48-hour period (TURP 2007). While its prime aim is to track and model individual space-time behavior, it lends itself very well to an examination of rural-urban differences in aggregate behavior.

The Halifax Regional Municipality (HRM) is a partner in this project, and hopes to employ resulting data for land-use and transportation planning. For its recently-approved Regional Plan (French and Millward 2007), HRM divided the municipality into four 'settlement zones', and these zones have been incorporated in the STAR coding. Conceptually, the zoning scheme was based on the rural-urban fringe concept (Bryant et al. 1982, Coppack et al. 1988, Furuseth and Lapping 1999), with zones delimited operationally on the basis of both water and sewer services

(central versus on-site), and commuting linkages (percentage of resident employed labor force employed in the urbanized area). The four zones may be described as follows:

- *Inner City* (a.k.a. Urban Core): the older developed areas of Halifax and Dartmouth,
- *Suburbs*: built-up areas adjacent to the urban core that are serviced by central water and sewerage systems,
- *Commuter Belt* (Rural-urban Fringe): transitional areas impacted by subdivision development and land uses that serve urban areas,
- *Remote Rural* (Rural): areas with no piped services, not influenced by significant development, and highly dependent on resource activities.

Inner-city areas were nearly all developed prior to 1960, before significant impacts from both urban planning and widespread automobile ownership (both of which reduced housing densities and separated land uses). They thus have smaller lots and more mixed land-use patterns than the suburbs. Beyond the urban service boundary, the need for on-site wells and septic fields is reflected in zoning requirements for minimum lot areas, and leads to “large-lot” (0.4 – 2 ha) or even “estate-lot” (>2 ha) developments. Beyond approximately 50 road-kilometers from the city centre, less than a third of workers commute to the urban area, and we leave the commuter belt.

Time Use by Rural-Urban Zones

The STAR project aims to sample 2,500 households, or about one household in 40 within HRM. All household members over the age of five will complete 48-hour time diaries, though only one “primary respondent” over the age of 15 will be selected for GPS tracking and diary verification. The sample will be stratified for age, sex, and geographic zones, with the survey questions and coding conforming closely to those employed in the Canadian national time use surveys. To date, we have only completed 390 person-days of surveys and coding for primary respondents, so the results reported here are preliminary, and the interpretations are tentative.

Table 1 shows time spent in major activity groups, for all respondents and for participants (‘doers’) only, in the four settlement zones. Note that sample size is very small for remote rural areas, and results for this zone are at present highly unreliable. Similarly, the number of participants is very low for certain categories (care-giving, education, organizational, and entertainment), and results for these categories must be treated with caution. Participation rates for each activity group can be calculated as mean for all divided by mean for participants.

Work Activities. Average time in *paid work* is very low in remote areas, owing to a very low participation rate (25%), which was expected. Less expected, perhaps, is the low mean for participants in this zone, which suggests a high incidence of part-time work. Participation is also below average in the suburbs (42%), but suburban doers spend most time at work. Means and participation rates for the inner city and commuter belt are very similar.

Domestic work occupies increasing amounts of time, for all and doers, as we progress outward from inner city to the remote rural zone. That is, there is a clear *urban-to-rural gradient*, which accords well with sociological notions regarding the nature of urban life (Wirth 1938) and with the ‘family status’ component identified in factorial ecology studies of urban social patterns (Davies and Murdie 1993). Some immediate causes of the increase are larger dwellings, more household members, owner-occupied tenancy, and more children per household. The unusually

high values in remote rural areas may also reflect low participation in paid work (and thus more time available for other activities).

Table 1. Time in major activity groups, by settlement zones, for all and doers.

Activity Groups (mins / 24 hrs)	Geographic Zones							
	Inner-city n=84		Suburban n=243		Commuter belt n=55		Remote rural n=8	
	All	Doers	All	Doers	All	Doers	All	Doers
Paid work	225	450	198	471	236	448	58	233
Domestic work	111	126	145	158	159	175	311	311
Care-giving (household)	13	61	26	86	45	139	41	110
Shopping / services	53	73	61	86	77	99	50	80
Personal care (incl sleep)	641	641	637	637	638	638	695	695
Education	1	124	10	335	15	275	0	.
Organizational	19	60	38	123	47	124	4	33
Entertainment events	57	123	57	138	61	168	30	241
Sports / hobbies	73	114	78	136	66	126	54	108
Media / communication	226	260	194	214	120	153	290	331
Residual	5	129	1	274	0	.	0	.
Travel in all above	81	89	107	112	138	141	54	71

Bold figures: adjacent zones are significantly different at $p=0.05$ (Mann-Whitney test).

Other Non-leisure Activities. As one would expect, time in *personal care* is very similar in most zones. The exception is the remote rural area, with almost an hour extra in this category; the explanation again would seem to lie in low workforce participation, which allows a slower pace for other activities.

Care-giving for household members (usually children) is very low in the inner city, owing to low participation (fewer children). It is even low for participants, which may reflect fewer young children. Here again we see a steep urban-to-rural gradient, with times increasing both for all and participants, and being particularly high in the commuter belt.

Participation rates for *education* are very low in all zones, since all prime respondents must be over 15, and also because coding completed to date relates to the period April to mid-June, so that university attendance would be captured. Little reliance can therefore be placed on the data.

Fewer but longer *shopping* trips were expected in rural areas, and the data tend to substantiate this: time spent in shopping (including travel to shop) increases away from the city. In remote areas, too, there is a decline in participation rate, suggesting a rational accommodation to limited opportunities. The decline in time per participant in such areas, however, is harder to explain, and a larger sample is required here.

Organizational activities refer to attendance and unpaid work in voluntary organizations such as volunteer fire departments, service clubs, and churches. Time per participant is high in both suburbs and commuter belt, but the participation rate is higher in the latter. Inner-city times are

notably low, both overall and per participant, which conforms to sociological work on community cohesion in highly urbanized settings (Wirth 1938, Wellman and Leighton 1979).

Leisure Activities. Discretionary leisure activities comprise the three activity groups of *entertainment events* (out-of-home), *active leisure* (sports, hobbies, etc.), and *media / communications* (TV, reading, computer games, etc.). Time spent on media is easily the largest segment, and there is also very high participation in this activity group (88%). There is an interesting urban-to-rural gradient, in that media activity declines from inner city to commuter belt, both in participation rate and time per participant. Those in the commuter belt spend less time watching TV, it seems, but more time attending (and driving to) entertainment events. This probably reflects high levels of child chauffeuring and attendance at little-league sports events (Tillberg Matson 2002).

Travel Times

To explore travel times, several variables were derived directly from episode data (table 2). These data refer to all trips, by whatever mode, except for those undertaken purely for pleasure or recreation. Most people participate in some such travel, though the rate is only 75% in the remote rural zone, perhaps suggesting housebound elders. Elsewhere, there again appears to be an urban-to-rural gradient, with the participation rate increasing somewhat away from the city center. Both number and duration of trips are lowest in remote rural areas, even for participants; total duration is under one hour per participant, and duration per trip is very short (9.9 minutes). Seemingly, where trips to the city are prohibitively costly in time or gas, people have little choice but to use local facilities or go without.

Elsewhere, there are urban-to-rural gradients for both total and average trip duration, as we would expect. For participants, total duration increases from 79 minutes in the inner city to 121 minutes in the commuter belt, and average trip duration from 12 to 17 minutes.

Tripcounts. The largest group of trips is for shopping, when averaged for all respondents. In all zones, the average is 2.0 to 2.6 such trips per day. There is a high participation rate for shopping trips, too, and average tripcount per participant is almost constant across zones.

Trips to/from paid work are frequent for doers, and as we would expect average approximately two per day. However, some participants in the inner city go home for lunch, bringing the average up to 2.4. Average counts fall with distance from the city, to only 1.5 in remote rural areas, which suggests the possibility of overnight or even weekly commuting.

Although trips for household-member care have low participation, there is a high tripcount for doers: as with trips to/from work, there are more trips in the inner city, and fewer in the commuter belt. Clearly, more participants in both inner city and suburbs are making double trips for childcare.

Trip Durations. Table 3 shows total trip durations by activity group. Participation rates in remote areas typically being much lower than elsewhere. Mean total durations for travel during paid work are very long for both suburban and commuter-belt participants, but the results are highly positively skewed, with medians being much lower.

Trips to/from paid work have the next longest duration. The mean total is highest for suburban participants (45 minutes), though it is almost as high in the commuter belt. For doers, average one-way trip durations (total duration / tripcount) are 21.3 minutes for suburbs, 19.4 for commuter belt, 15.1 for inner city, and 11.7 for remote rural. Though these journey times are fairly similar, there are probably marked differences in average distances and speeds: for example, inner-city commuting is probably over shorter distances at slower speeds.

Table 2. Total trips by settlement zones, for all and doers.

Trip Variables	Inner-city n=84		Suburban n=243		Commuter belt n=55		Remote rural n=8	
	All	Doers	All	Doers	All	Doers	All	Doers
Number of Trips	6.4	7.3	6.0	6.3	7.0	7.0	4.3	5.7
Total Duration (mins)	69.4	78.8	96.4	101.0	120.9	120.9	42.3	56.3
Average Duration (mins)	10.8	11.6	16.1	17.6	18.0	17.3	9.8	9.9

Bold figures: adjacent zones are significantly different at $p=0.05$ (Mann-Whitney test).

For shopping trips, there is a clear urban-to-rural gradient: total duration rises from inner city out to the commuter belt, but then falls sharply in the remote rural zone. However, average trip durations for participants are similar (9 to 10 minutes) in all but the commuter belt, where it is almost twice as high (20 minutes). That is, residents of the commuter belt shop less frequently, but their shopping trips are considerably longer.

Suburban areas have high total trip durations for childcare and organizational activity, when compared to both inner city and commuter belt (table 3). Total and mean trip durations tend to be lowest in the inner city for these and leisure activities, which is as we might expect. They also tend to be fairly low in the commuter belt, which was not expected. One explanation is that travel speeds are faster in this zone, for those trips that are taken. A second explanation is that exurbanites make fewer discretionary trips into the city than do suburbanites.

Travel Times by Mode. We expect urbanites to spend more time walking, bicycling, and using transit, and a smaller proportion of travel time in cars, and the data suggest this is largely so. On average, inner-city respondents spend only 51 minutes per day in a car (37 as driver, 14 as passenger), whereas suburbanites spend 89 minutes, and exurbanites 105 minutes. This urban-to-rural gradient breaks down in remote rural areas, however, where only 42 minutes per day is spent in auto travel. Interestingly, too, remote residents were more likely to be a passenger than a driver, suggesting more one-car or no-car households. In other zones, though, participation as a car driver increased outwards from the city center (from 63 to 91%), and time per driver increased from 59 to 109 minutes. Drivers in remote areas spent only 37 minutes behind the wheel.

Transit (bus) use is low in all areas, reflecting low response rates to date from those age and income cohorts most reliant on buses. There was only 8% participation in bus travel in the inner city, 2% in the suburbs, and 5% in the commuter belt. There is much higher participation in walking (40-50% in most zones), with surprisingly high durations for doers in all zones (but particularly the two rural zones).

Table 3. Trip durations by activity group, by settlement zones, all and doers (mean mins/24 hrs).

Trip Purpose	Settlement Zones							
	Inner-city n=84		Suburban n=243		Commuter belt n=55		Remote rural n=8	
	All	Doers	All	Doers	All	Doers	All	Doers
During Paid Work	1.8	25.2	11.7	134.8	11.6	63.7	6.9	55.0
To-From Paid Work	14.4	36.5	15.6	45.2	19.7	40.2	4.4	17.5
Domestic	3.3	21.3	3.3	23.8	9.2	38.7	1.3	10.0
Child-Adult Care	4.7	23.2	8.3	38.7	5.9	25.1	5.3	42.0
Goods or Services (shopping)	24.8	32.0	26.9	36.5	52.1	65.1	19.5	31.2
Personal care	0.4	18.0	0.2	19.7	0.0	.	0.0	.
Education	0.1	7.0	0.2	16.0	2.0	55.0	0.0	.
Organization, Volunteer, Religious	6.4	21.5	15.8	65.0	6.0	20.4	4.1	33.0
Entertainment events	8.5	29.9	10.0	33.9	9.2	33.7	0.9	7.0
Sports, Hobbies	5.0	32.2	4.4	25.2	5.3	32.2	0.0	.
Media or Communication	0.1	5.0	0.1	4.7	0.0	.	0.0	.

Bold figures: adjacent zones are significantly different at $p=0.05$ (Mann-Whitney test).

Summary and Tentative Conclusions

This study has reported preliminary results on personal time use and travel activity in four geographic zones surrounding a medium-sized Canadian city. Since the Halifax Regional Municipality contains only one urban area, and extends to remote localities well beyond commuting range of the city (or indeed of any other town), a clear zonation based on the rural-urban continuum can be delineated. The four settlement zones, based on accessibility, density, and economic criteria, are labeled inner city, suburbs, commuter belt, and remote rural.

Results show major zonal differences in both time use and travel activity. The two “urban” settlement zones (inner city and suburbs) share some characteristics, just as do the two “rural” zones. However, there are marked intra-urban differences, and even larger intra-rural differences. No zone is greatly similar to neighboring zones, but there are more commonalities between suburbs and commuter belt than between commuter belt and remote rural areas.

For time use by activity, the suburbs are most typical, scoring medium for most categories. The inner city and commuter belt are quite dissimilar in care-giving and shopping times, while remote areas score unusually low for paid work and high for both domestic work and media. For

travel behavior, remote areas are clearly exceptional, scoring low on all trip variables (number of trips, total time, and time for journeys to work and shop). While long trips and much driving were expected in the commuter zone, the lack of travel in remote areas is somewhat surprising. It may be understandable, however, as the combined result of lack of need, lack of opportunities, and adjustments in discretionary behavior.

The large differences in zonal time use and travel behavior revealed by this study amply justify moving from a crude rural/urban dichotomy to a more graduated range of settlement categories, based on accessibility and density criteria. Once the full STAR data set is available, it is expected that many results outlined in this paper will be substantiated, and shown to be significant. We can then explore more fully their implications for social and transportation policy, and land planning.

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References

- Bourne, L., & Simmons, W. (1982). Defining the area of interest: definitions of the city, metropolitan areas, and extended urban regions. In L. Bourne (Ed.), *Internal structure of the city, 2nd ed.* (pp. 57-72). New York, NY: Oxford University Press.
- Bowler, I. (1992). The industrialization of agriculture. In I. Bowler (Ed.), *The geography of agriculture in developed market economies* (pp. 7-31). Harlow: Longman.
- Bryant, C., Coppack, P., & Mitchell, C. (2000). The city's countryside. In T. Bunting & P. Filion (Eds.), *Canadian cities in transition, 2nd ed.* (pp. 333-354). Don Mills, Ont.: Oxford University Press.
- Bryant, C., Russwurm, L., & McLellan, A. (1982). *The city's countryside*. London: Longman.
- Cloke, P. (1977). An index of rurality for England and Wales. *Regional Studies*, 11, 31-46.
- Coppack, P., Russwurm, L., & Bryant, C. (Eds.). (1988). *Essays in Canadian urban process and form III: the urban field*. Waterloo: University of Waterloo, Department of Geography, Publication Series no. 30.
- Dahms, F. (1998). Settlement evolution in the arena society in the urban field. *Journal of Rural Studies*, 14(3), 299-320.
- Davies, W., & Murdie, R. (1993). Measuring the social ecology of cities. In L. Bourne & D. Ley (Eds.), *The Changing Social Geography of Canadian Cities* (pp. 52-75). Montreal: McGill-Queen's University Press.
- French, A., & Millward, H. (2007). The 2006 Halifax Regional Plan: Process and Overview. *Plan Canada*, 47 (1), 40-43.
- Friedmann, J., & Miller, J. (1965). The urban field. *Journal of the American Institute of Planners*, 31, 312-319.
- Furuseth, O. (1998). Service provision and social deprivation. In B. Ilbery (Ed.), *The geography of rural change* (pp. 233-256). Harlow: Longman.
- Furuseth, O., & Lapping, M. (1999). *Contested Countryside: the Rural-Urban Fringe in North America*. Aldershot: Ashgate.

- Harrington, V., & Donoghue, D. O. (1998). Rurality in England and Wales 1991: a replication and extension of the 1981 rurality index. *Sociologia Ruralis*, 38(2), 178-203.
- Harvey, A. (1994). Changing temporal perspectives and the Canadian metropolis. In F. Frisken (Ed.), *The changing Canadian metropolis: a public policy perspective, vol. 1* (pp. 151-199). Berkeley, Cal.: Institute of Governmental Studies Press.
- Harvey, R., & Clark, W. (1965). The nature and economics of urban sprawl. *Land Economics*, 41, 1-9.
- Healey, M., & Ilbery, B. (Eds.). (1985). *The industrialization of the countryside*. Norwich: Geobooks.
- Mayer, H. (1971). Definitions of 'city'. In L. Bourne (Ed.), *Internal structure of the city, 1st ed.* (pp. 28-31). Toronto: Oxford University Press.
- Millward, H. (2000). The spread of commuter development in the Eastern Shore Zone of Halifax, Nova Scotia, 1920-1988. *Urban History Review*, 29(1), 21-32.
- Millward, H. (2005). Rural population change in Nova Scotia, 1991-2001: bivariate and multivariate analysis of key drivers. *Canadian Geographer*, 49(2), 180-197.
- Millward, H. (in press). Rural-urban contrasts in space-time activity: evidence from the 2005 Canadian time-use survey. Paper presented at the 6th Quadrennial Conference of British, Canadian, and American Rural Geographers, July, 2007., Spokane.
- Miron, J. (2000). Cities as real estate. In T. Bunting & P. Filion (Eds.), *Canadian cities in transition, 2nd ed.* (pp. 154-172). Don Mills, Ont.: Oxford University Press.
- Pacione, M. (1982). The viability of smaller rural settlements. *Tijdschrift voor Economische en Sociale Geografie*, 73, 149-161.
- Pahl, R. (1966). The rural-urban continuum. *Sociologia Ruralis*, 6, 299-327.
- Paquette, S., & Domon, G. (2003). Changing ruralities, changing landscapes: exploring social recomposition using a multi-scale approach. *Journal of Rural Studies*, 19(4), 425-444.
- Pryor, R. (1968). Defining the rural-urban fringe. *Social Forces*, 47(2).
- Robinson, G. (1990). *Conflict and change in the countryside*. London: Belhaven.
- Rucker, G. (1984). Rural transportation: another gap in rural America. *Transport Quarterly*, 38, 419-432.
- Slifkin, R. T., Randolph, R., & Ricketts, T. C. (2004). The changing metropolitan designation process and rural America. *Journal of Rural Health*, 20(1), 1-6.
- Theobald, D. M. (2001). Land-use dynamics beyond the American urban fringes. *Geographical Review*, 91(3), 544-564.
- Tillberg Mattsson, K. (2002). Children's (in)dependent mobility and parents' chauffeuring in the town and the countryside. *Tijdschrift voor Economische en Sociale Geografie*, 93(4), 443.
- TURP. (2007). *Halifax Regional Space Time Activity Research (STAR) Survey: Project Description*. Halifax: Time Use Research Project, Saint Mary's University
- Walker, G. (2003). Stabilizing the new residential frontier in the countryside. In K. Beesley et al. (Eds.), *The New Countryside: Geographic Perspectives on Rural Change* (pp. 414-426). Brandon: Brandon University, Rural Development Institute.
- Wellman, B., & Leighton, B. (1979). Networks, neighborhoods, and communities: approaches to the study of the community question. *Urban Affairs Quarterly*, 14, 363-390.
- Wimberley, R. (1993). Policy perspectives on social, agricultural, and rural sustainability. *Rural Sociology*, 58, 1-29.
- Wirth, L. (1938). Urbanism as a way of life. *American Journal of Sociology*, 44, 3-24.