

## IMPLICATIONS OF EXURBAN RESIDENTIAL DEVELOPMENT: A REVIEW\*

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The complex, symbiotic relations that exist between urban and rural areas have long been of interest to academics and planners. The interactions between urban and rural land uses and activities are most apparent at the boundary or "fringe" between urban and rural areas. However, as urban-oriented activities have expanded far beyond built-up areas, this fringe zone has become far more extensive and less easily demarcated. One of the most widespread manifestations of urban expansion into rural areas is exurban residential development in its various forms.

The ubiquity of exurban residential development has generated a recent flurry of research by academics and stimulated an interest by the general public and concerned policy makers. However, despite this interest, the subject remains an immature field. The relationships between, on the one hand, local situations and practical concerns, and, on the other, developments in related theory or disciplines remain unclear and relatively unattended.

The purpose of this review is threefold: first, to examine the nature of exurban residential development and its position within the context of rural-urban relations; second, to assess the implications of this sort of land use change in rural areas; and third, to discuss possible research strategies for two related planning issues, land use policy and municipal service provision. Some of the examples are drawn from the United States and Great Britain, but emphasis is given to the Canadian context.

### Rural-Urban Relations

Rural-urban relations in western economies have undergone considerable change during this century. The market town has been

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supplanted by the metropolis [38], the family farm has given way to "agro-business" [3], and the traditional foundations of rural-urban social differences have been eroded [27]. Clark [13] has noted that the macro-location of population and economic activity in the industrial world has tended towards an ever-increasing concentration in a limited number of areas; their micro-location, on the other hand, tends towards an increasing diffusion of "sprawl." In this environment, two forms of rural region have emerged: first, the sparsely populated, peripheral, and still dominantly agricultural region; and, second, the more heavily populated "central" region, with more diverse land use activities, proximate to large urban centres [8; 17].

The character of a rural region, whether peripheral or central, springs from a combination of internal and external pressures. Internally, the adoption of improvements in production and transportation technology and new organizational structures in agriculture has reduced the farm populations of many countries. In the United States [9] and England and Wales [76] this reduction has been by as much as half over the two or three decades following 1945. In Canada, the farm population fell from just under three million in 1951 to just over one million in 1976 [47]. Externally, urban centres have had a centripetal influence on peripheral rural regions, drawing off population and economic activities in the classic core-periphery fashion and exacerbating the impact of changes in agriculture [17]. On the other hand, urban centres have had a centrifugal influence on more proximate rural regions. These accessible rural regions have served as land reservoirs for urban-oriented activities, including residential development [42; 24].

At a macro scale, the changing nature of rural-urban relations has frequently been discussed through reference to aggregate demographic data drawn from census sources [6]. Examination of such aggregate data, however, has not provided answers to even very general questions. For example, analysis of change in United States county populations in the 1950s and 1960s has been used in support of the hypothesis that a clean break from "metropolitanization" has occurred in the urbanization process [71], as well as to bolster the conflicting proposition that urbanization is continuing in broadly the same manner, but "spilling-over" from traditional metropolitan cores [29]. The resolution of general issues such as these and the addressing of more specific questions demands consideration of data more directly related to the areas affected and processes involved.

A common approach has been to consider developments in rural-urban relations within a regional framework. Such regional treatments have focused primarily upon the rural-urban fringe. Expositions on the nature and extent of the fringe have proliferated since Burgess identified a fringe belt in his model of the city [70]. How-

ever, synthesis of the literature on the rural-urban fringe is hampered by a multiplicity of terms and definitions [55] and by a preoccupation with the question of spatial definition [20]. It is debatable whether a general definition of the fringe is necessary, or even helpful, in the investigation of patterns, processes or problems in rural areas near urban centres, since delimitations of the fringe should vary depending upon the phenomenon or process of interest to the researcher. Thus, the area in which land speculation is of concern may be quite different from the area in which land use conversion from agriculture is widespread. This, in turn, may not correspond to the area within which nonfarm residences are increasing in density or to the area into which industrial complexes are expanding. It is clear that many issues, such as land use patterns, changes or conflicts, population shifts, or land ownership characteristics, can be examined wherever they occur, and do not require a general or all-purpose definition of the fringe. Thus, although a plea has been made for consideration of the fringe as a special region [61], this could prove a hindrance to the systematic consideration and comprehension of the processes underlying changing rural-urban relations, which are unlikely to recognize regional boundaries.

One such process is exurban residential development, which has substantially shaped recent developments in rural areas proximate to centres of urban population. This phenomenon and its implications for rural areas are the focus of this paper.

### Exurban Residential Development

The term "exurban residential development" is used here to describe residential development in the countryside which is urban-initiated but is physically separate from the urban centre. Thus, an exurbanite is an individual who resides in the country but maintains strong ties, chiefly through employment, with an urban centre. Exurban residential development has taken a number of forms, ranging from the conversion of farmhouses, through the building of rural estates, to the expansion of existing rural settlements.

The prevalence of "urban sprawl" [14], or of "leapfrogging" [31], around American cities is well documented, as it is also for Canadian cities [24; 61]. Although low density residential development at the periphery has been a feature of the western city throughout the twentieth century, in recent decades urban development has reached further afield from urban centres, and at lower densities than formerly, into the surrounding countryside [32; 63]. Dubbed by some as the "flight to the fringe" [1], this increasingly widespread form of residential development reflects changing locational opportunities and preferences on the part of a sizable proportion of the urban population [4].



Increased opportunities for residential location in rural areas have resulted largely from rising personal incomes and greater mobility [62; 22; 37]. Within these constraints of income and mobility, however, the actual form and extent of residential development in the countryside depends upon the locational preferences of households. Such preferences are influenced not only by income, but also by household size, stage in the life cycle, and so forth [65]. Several studies indicate that preferences for rural living combine both anti-urban and pro-rural sentiments. Exurbanites often attempt to improve their "quality of life" by exchanging the disamenities of the city, such as pollution, congestion, or whatever, for the amenities of the country [78]. The perceived amenities of rural living may include the natural surroundings and open spaces or the rural community atmosphere [74; 37; 73; 40]. For many exurbanites, however, the desire for countryside living is tempered by the necessity of a continuing tie to urban employment centres [23; 12; 52]. Thus, in many instances, actual migration behaviour by households may not be congruent with expressed migration preferences [18]. Those who profess a desire for location in a truly rural environment may be forced to settle for a less satisfactory location nearer to their employment.

The extent of exurban residential development around Canadian cities is indicated by the notable increase in the population of rural areas proximate to cities and by the amount of land converted to residential use in those same areas. However, although published data are readily available on both rural population and rural land use, neither provides an unambiguous base upon which to measure exurban residential development. In connection with rural population growth, it is impossible to separate exurban-induced change from that which originates locally from changing birth and death rates, new economic development, and so on. At the same time, although the land conversion data can be used to plot the general tempo of exurban residential development [10], estimates of farmland loss to urban development quoted in the literature [53] may underestimate the extent of exurban residential development. There is evidence that many exurban residents are particularly attracted to areas with varied terrain and landscapes, which may not have been suitable for agriculture [48] and thus may not have involved conversion from farming.

Although the extent of exurban residential development around Canadian cities cannot be measured precisely, the phenomenon is sufficiently widespread that the implications of increasing residential development in the countryside are worthy of scrutiny.

### Implications of Exurban Residential Development

Residential development in the countryside creates a mix of community problems and issues which differs from that which has previously confronted most rural areas. Increasing pressure is exerted on the land base, on community resources, on the local social structure, and so forth. The impact of such development has come under close scrutiny, and a number of problem areas have been identified [72; 70; 31]. In this review, the consequences of exurban residential development are examined in terms of land use issues, impacts on rural settlements and society, and implications for public service provision.

#### Land Use Issues

The effect that a particular land use has on neighbouring uses is a major local planning concern. In rural areas that have experienced substantial growth in nonfarm population, there is considerable potential for conflict between agricultural and residential uses. As well, there is a conflict evident in attempting to maintain the attractive features of a rural area that have enticed many of the nonfarm residents out of the city, while at the same time continuing to allow more development so that others can take advantage of this lifestyle.

In assessing such conflicts it is useful to consider the pattern of exurban residential development as it has evolved in Canada. Non-farm residential development is commonly characterized by isolated residences on large lots, and by small pockets of dwellings, in some places well removed from existing rural settlements, elsewhere in close proximity. The discontinuous nature of residential development is attributable to the independence of decision-making which has prevailed in most rural areas [32]. It has been noted that one of the motivating factors in selecting a rural over an urban home location is that of establishing a degree of privacy not available in congested urban areas [73]. This may well contribute to the tendency of nonfarm residents to build isolated residences. In addition, however, it is apparent that many homebuilders seek out scenic lands and try to take advantage of landscape features so as to have a view uncluttered by other homes or nonagricultural uses [48; 40]. It is this "disorderly" pattern of residential development, perhaps as much as anything else, that is viewed as having adverse effects on rural areas [70; 31].

A number of land use concerns arising from the haphazard nature of development have been identified. These include social concerns as well as the impact of residential development on the rural environment. As the number of homes and people increases in the countryside, so do the ancillary land uses such as shopping



outlets, gasoline stations, and so on, to provide for the new population. This results in substantial modification of the visual environment, often in ways that may not be compatible with everyone's notion of the countryside [73]. Indeed, many of those who first sought a peaceful rural environment may well find their rural ideal compromised by the influx of more nonfarm people.

One of the most frequently cited impacts of exurban residential development is its effect on the local agricultural industry. Several authors suggest that low density nonfarm development has detrimentally affected agriculture due to farm fragmentation, rising land values, and restrictions on farm operations [61; 58; 59; 11]. They point out that modern agriculture requires large fields for efficient production, whereas the introduction of urban uses fragments land parcels and restricts opportunities for future farm amalgamation.

Further, it is argued that the presence of nonfarm people actively competing in the rural land market serves to inflate land values. Whether these impacts on land prices represent a significant problem is open to debate. Frankena and Scheffman [21] argue that changes in land prices are the appropriate response to changes in demands. They point out that current land rents, which determine land use, may not be affected by price changes, and, since the demand for residences is limited, the impact on prices and on rents (and hence on land use conversion) is also limited. At the same time, there is little evidence that farmers perceive increases in land prices as a problem. Smit and Flaherty [68], for example, found that farmers evaluated the inflationary effect of nonfarm development on land prices in a positive way.

While many direct and indirect effects of residential development upon agriculture have been identified, perhaps the most widely debated issue concerns the extent and consequences of land use conversion from agriculture, or what is more commonly referred to as "loss of farmland" [7; 58]. Certainly, areas of land once used for farming have been converted to residential use. However, Miller and Arthur [50] argue that concern over land conversion to nonfarm residences is overstated, as the areas involved are relatively small. Similarly, Frankena and Scheffman [21] review available data on land-use conversion and draw two conclusions. First, the rate of conversion of land to built-up urban use is low in relation to the rate of productivity increase in agriculture and the stock of agricultural land. Secondly, the aggregate rate of conversion of land to rural nonfarm residential use has been lower than the rate of conversion to built-up urban use.

Even if conversion of agriculture land per se is not a pressing issue in Canada, the loss of land of high agricultural capability may be [80; 25; 44], particularly given that about fifty percent of Canada's population resides on the best five percent of its agricultural land [24]. Available evidence for Ontario, however, suggests that land

converted to nonfarm residential use had come in disproportionately large amounts from lower quality agricultural land than from land with high capability for agriculture [46; 58; 48; 21].

Furthermore, as Frankena and Scheffman [21] point out, the fact that areas of land well suited for agriculture are converted to other uses does not, in itself, represent a serious problem worthy of government intervention. It would represent a problem if the conversion of land use implies that fundamental societal goals from the use of land cannot be met now or in the future. Unfortunately, few studies have assessed the land resource relative to the demands and requirements associated with the use of rural land.

### **Rural Settlement and Social Organization**

Changes in the functioning of rural settlements and in rural society are a response to many factors, of which exurban residential development is only one [56]. In Canada, a decreasing percentage of the rural population continues to be actively engaged in agriculture, and this trend will likely continue in the years ahead. This has obvious implications for the size of rural farm populations and the degree to which they provide economic support for rural settlements. In areas within the commuting range of urban centres, however, exurban residential development has served to compensate, or more than compensate, for the decline in farm population [16]. This has brought about a greater urbanization of rural society and a more urban-oriented settlement system, in which ties from small to large centres predominate over those between small centres and surrounding rural areas. Thus, in contrast to the problems of population loss in peripheral rural areas, many rural areas proximate to cities are faced with the problems of assimilating, or adapting to, an increasing population.

Changes in rural society and settlements have fundamental impacts on those who live in the countryside, whether they be newcomers or well established rural residents. As the rural population swells with newcomers, a potential for social and political conflict between individuals and groups builds up [51]. Community boundaries may be disturbed, old political alliances upset, shopping patterns modified, and community solidarity may be threatened [63]. It is usually assumed that conflicts derive from differences in values or aspirations or even general attitude toward the countryside [75; 54].

It is common practice to consider the opposing points of view in rural communities to "urban" and "rural" individuals or groups [27]. There is mixed opinion, however, as to what distinguishes urban-oriented people from rural-oriented people in non-metropolitan areas [5]. Residential location is hardly a useful differentiating characteristic, and the usefulness of occupation as a discriminator has



been undermined by the progressive decline in the role of agriculture in rural areas. Although some researchers have stressed rural-urban differences in characteristics such as life expectations [49] and consumer behaviour [28], others maintain that such differences are equally, if not more, pronounced between the inhabitants of small and large urban centres [27]. The blurring of urban-rural differences is a not unexpected outcome of decades of urbanization in many rural localities.

Thus, although the social stress produced by rapid exurban residential development has been frequently noted [75; 15], the characteristics of the conflicting groups have not been clearly identified. Even in connection with a fundamental issue like land use control, Smit and Flaherty [67] found that the preferences of farmers for land severance policies did not differ significantly from those of nonfarmers. The degree of difference in attitudes between farmers and nonfarmers, or other elements of the rural community, has quite probably been overstated. There is clearly a need for rigorous investigation of attitudes towards various issues in the countryside and of preferences of rural residents for alternative responses or solutions.

#### **Public Service Provision**

The impact of exurban residential development on the provision of public services is considered to be a key issue by many commentators [41; 76; 15]. At a general level, exurbanites may help rejuvenate the market for some services and facilities in declining rural settlements. However, the growing importance of both scale economies in the supply of goods and services and changing patterns of mobility make small service centres increasingly less important in the spatial organization of both public and private service provision systems [36]. The decline of the service function of small centres has had serious implications for the welfare of rural residents with restricted mobility, who find themselves increasingly isolated from centralizing services that were traditionally available in smaller communities [77]. An excellent example is the rural family medical practitioner, who has become an increasingly rare feature of the Canadian rural landscape.

Centralization has been most evident in connection with services, such as health care, which are funded and administered at senior levels of government [36]. Many other public services, funded and administered at the municipal level of government, have been affected more by the density characteristics of rural residential development than by changes in the structure of service networks.

Low density residential development, whether in the form of isolated units, strips along roads, or small agglomerations, has important implications for the provision of a wide range of

municipally-based public services such as road maintenance, water supply, sewage disposal and refuse collection. The cost of providing most of these services is substantially increased by the discontinuous nature of exurban residential development [2; 41]. It has been argued that because municipal services are usually organized and funded on a community-wide basis, it is rare for the total costs to be passed on to those who reap their benefits [2; 11]. On the consumer side, Greenwood [30] has suggested that while new residents weigh the personal benefits and costs of a rural location, they rarely take into account the overall costs to the community they are joining. These externalities become apparent to residents only after they are embodied in planning controls or property taxes [44; 35].

Counter to the argument that the whole community pays the bill for the inefficiency of exurban residential development are the observations that new residents expand the tax base and may shun many services in their quest for a rural lifestyle [11]. This raises the question of changing demands for services. It is frequently suggested that newcomers always press for more and/or better quality services [34; 63], although Clawson [15] observes that much depends upon the age composition of the new residents. For example, younger immigrants are likely to generate a need for more education services, whereas older ones may well encourage greater emphasis upon health related services. Empirical evidence on service demands is lacking, however, and the extent to which changed demands for services result from the different demands of exurbanites, from changes in the demands of other rural residents, or simply from the increase in the community population is difficult to assess. Whatever their origin, the basic problems of identifying these demands and bearing the costs of providing services remain.

#### **Possible Research Strategies**

Despite much public debate and considerable academic comment on exurban development in recent years, the phenomenon remains surprisingly little understood. There is a need for comprehensive empirical enquiry because many commentators draw conclusions from, and suggest policies for, exurban development in the absence of substantive information about its extent and consequences. There is also a need to integrate the various threads of investigation in this eclectic field with conceptual foundations. Theory in this area is very poorly developed, and that in related fields is only rarely acknowledged in examinations of exurban residential development.

This review suggests two areas where a clear need and opportunity exist for a genuine contribution to the understanding of the implications of exurban residential development. These are the issues of land use controls and the provision of municipal public



services. Although the ramifications of exurban residential development extend beyond these two issues, they are central to the planning dilemma facing many rural areas: Should land be protected from residential development? and, What measures need to be taken to meet the service needs of a changing rural community?

### Land Use Controls

Justification for planning controls on residential development in the countryside conventionally pertains to two levels of concern. First, at the local level the issues include aesthetics, conflicts, the viability of the local agricultural sector, and the environment. At present, however, local planners and decision makers are required to make decisions on land severances and other land use policies to control rural residential development without adequate empirical information on the nature and extent of the implications. There are few studies which rigorously investigate the impacts of exurban development on the rural environment and on other rural activities. Thus, the information base for land use policy is very flimsy. Assuming that future empirical work indicates that there are some significant detrimental impacts, there remains a need for the systematic assessment of policies, both existing and proposed. Economic cost-benefit analysis, as proposed by Frankena and Scheffman [21], represents a step in this direction but methods are required to simultaneously assess land use policies from the point of view of social and environmental impacts. In the absence of rigorous empirical analyses, there will be no choice but for planning to continue to be based upon inadequate information, rhetoric, conventional wisdom and conjecture.

Secondly, planning controls are rationalized on the basis of concerns that pertain to a broad public interest; in particular, that residential development in the countryside consumes land that can be used for food production. The concern for the capacity to produce food is not so much an interest of specific municipalities, but rather a requirement or goal for society generally. Despite vociferous pronouncements that rural residential development should be limited because it consumes agricultural land, there is surprisingly little empirical information on the amount, location, type, and former use of lands now used for rural residences. A clear need exists for fundamental and sometimes laborious empirical work of the type undertaken by Gierman and Lenning [26]. Forecasts of the nature and extent of future exurban residential development also require both conceptual and empirical work on residential preferences under alternative sets of conditions.

Trends and forecasts of the conversion of land to rural residential use, by themselves, provide a far from adequate basis for land policy formulation. Such policy can be justified from the food requirement

standpoint only if there is evidence that recent or projected trends are likely to prevent the attainment of food production goals. Nevertheless, recommendations are frequently made that land with a high capacity for agriculture should be preserved for agricultural use. Surely this is an inadequate basis for policies. Is it necessary to preserve all of this land for agriculture? What about the many other legitimate uses of land, such as housing, aggregate extraction, forestry, transportation, recreation and conservation? In many instances, land that is "prime" for agriculture is also "prime" for these other uses for which there are legitimate demands also [66].

Although much information exists on the physical land resource base, methods have yet to be developed to assess this resource base relative to socioeconomic conditions and requirements from the land. Thus, policy makers and planners have not been provided with the information that is necessary to bridge the gap between, on the one hand, inventories of land resources and, on the other hand, priorities and policy decisions pertaining to the use of land.

One method of analyzing land resources relative to socioeconomic conditions pertaining to land use at a broad scale is via programming models. For instance, land use allocation models such as those developed at Iowa [33] can be employed to assess the land use implications of changes in conditions or requirements from the land. A slightly different approach to evaluating the land resource for multiple goals under alternative sets of future conditions has been proposed by Smit et al. [69]. Systems analysis is used to synthesize diverse information about land availability and its capability for alternative uses, product yields and input levels, non-land resource constraints, and requirements from the land.

Given these conditions, the feasible allocations of uses to land areas are assessed to identify those areas in which there is little flexibility of use if the specified requirements are to be met. The sensitivity of allocations to changes in conditions and requirements can also be measured. Programming models of this type can be used to evaluate the implications of, among other things, alternative scenarios for future exurban development. In fact, it is difficult to see how the broad implications of land use trends can be systematically assessed without some simulation system of this type.

### Municipal Service Provision

Research on public service provision in rural areas has tended to focus upon the general problem of providing services to a dispersed population at a time when scale economies in delivery of services are becoming increasingly important [60]. Although this problem is still of considerable importance in rural areas with stable or declining population, in areas experiencing population growth the pressing problem is one of accommodating changing demands for services.



This challenge is felt most keenly at the municipal level, where services are both funded and administered locally, and are thus most sensitive to localized changes in resident preference. Exurban residential development is, of course, a primary determinant of these localized changes.

The general implications of exurban residential development for public service provision in rural areas have already been discussed. It is nevertheless worth while to consider the merits of substantive work in this area. First, there is a need to put conjecture on the demands of exurbanites for municipal services in the countryside to the test. Do the preferences of newcomers differ significantly from those of well established residents? Second, there is a considerable potential for improving the planning of service provision in rural communities. The lack of consistent public involvement in the planning of service provision has long been lamented [64] and existing public participation strategies have come under close and critical scrutiny [81], so there is a pressing need to develop mechanisms for the incorporation of resident preferences into the planning of service provision.

Having provided some justification for the investigation of resident preferences concerning service provision, it remains to outline a feasible approach. A major recommendation is that resident preferences for municipal public services should be elicited within a realistic choice framework. All too frequently residents have been asked only to indicate their satisfaction with existing services and, perhaps, to suggest their priorities for improvement. This strategy is simplistic and can be misleading in that the cost of improving services is seldom indicated to the respondent. With budget constraints on municipalities being the rule rather than the exception, an improvement in one service would necessitate a transfer of funds from one or more other services; that is, improvements for particular services require that trade-offs be made with other services if municipal budgets are fixed. It is probable that preferences elicited in this constrained manner would be more accurate than those obtained in a traditional, unconstrained way. Moreover, they would be constrained in exactly the same way as the municipal decision-making to which they might contribute.

A trade-off game approach appears to fulfill the requirements discussed above. Examples of the use of trade-off games for eliciting constrained preferences are provided by Wilson [79], Hoinville [39], and Robinson et al. [57]. The basic principle of trade-off games is that players (respondents) are confronted with a number of services or service attributes, each with several possible quality levels. Each service level has an associated price, measured in points, chips or dollars. Respondents are allocated a budget and are allowed to purchase the quality levels they desire. By making the total budget

insufficient to permit purchase of the highest levels of all service attributes, trade-offs are forced. Players can allocate their budgets among alternative service attributes until they achieve the most satisfactory combination.

Robinson et al. [57] stress the advantage of starting with the current levels of services and the current budget, so that respondents can use their current situation as a "benchmark." Respondents are then able to improve upon the quality of one service attribute only by sacrificing the quality of one or more of the other services or service attributes.

Thus, via trade-off games, respondents indicate the direction in which they would prefer changes to occur from the current situation, given a limited number of alternatives and a finite budget. Analogous to the economist's indifference curve approach, the choice or trade-off between any two dimensions is assumed to be dependent upon the cost and utility associated with various quantities of each dimension [19]. The process of trade-off to obtain an optimal mix of the dimensions is thus a form of utility maximization: For a given budget, what combination of dimensions yields the greatest satisfaction?

The trade-off approach to identifying demands for services in a rural context is illustrated by Joseph and Smit [43]. Using the game format, residents indicated the municipally-provided services they would improve and those they would trade-off given a fixed municipal budget. The results provide an indication of the way in which rural residents would like to see their taxes apportioned for service provision. Differences in constrained preferences within the community, such as between exurban residents and long established or farm residents, can readily be examined.

### Conclusions

Exurban residential development is widespread and has substantial and far-reaching implications for rural areas. A review of the literature has demonstrated a paucity of both theory and empirical evidence on the nature of these implications. At present much policy is formulated in the absence of reliable information and rigorous analysis, notably in the areas of land use control and municipal service provision. In consequence, the rationale for policy is frequently questioned, the objectives of policy are sometimes unclear or ambiguous, policy is often difficult to implement and, when put into practice, may prove to be counter-productive. Among the many areas worthy of research, some possibilities for policy-oriented research on land use control and municipal service provision are suggested. Without innovative issue-oriented analysis, the need for



government involvement will continue to be questioned and the ability to formulate effective policy will continue to be impaired.

### References

1. Anderson, W. A. *The Flight to the Fringe*, Rural Sociology Publication 46. Ithaca, New York: Cornell University Agricultural Experiment Station, 1956.
2. Archer, R. W. "Land Speculation and Scattered Development: Failures in the Urban Fringe Land Market," *Urban Studies*, 10 (1973), 367-72.
3. Ball, A. G. and E. O. Heady (ed.). *Size, Structure and Future of Farms*. Ames, Iowa: Iowa State University Press, 1972.
4. Beale, C. L. "A Further Look at Non-metropolitan Population Growth Since 1970," *American Journal of Agricultural Economics*, 58 (1976), 935-58.
5. Bealer, R. C., F. K. Willits and W. P. Kuvlesky. "The Meaning of 'Rurality' in American Society: Some Implications of Alternative Definitions," *Rural Sociology*, 30 (1965), 255-66.
6. Berry, B. J. L. and D. C. Dahmann. "Population Redistribution in the United States in the 1970s," *Population and Development Review*, 3 (1977), 443-71.
7. Best, R. H. "Competition for Land between Rural and Urban Uses," in C. Embleton and J. T. Coppock (ed.), *Land Use and Resources: Studies in Applied Geography*. Special Publication No. 1. London: Institute of British Geographers, 1968, 89-100.
8. Best, R. H. and A. W. Rogers. *The Urban Countryside*. London: Faber and Faber, 1973.
9. Bishop, C. E. (ed.). *Farm Labor in the United States*. New York: Columbia University Press, 1967.
10. Bogue, D. J. *Metropolitan Growth and the Conversion of Land to Non-agricultural Uses*. Oxford, Ohio: Scripps Foundation Studies in Population Distribution, 1956.
11. Bryant, C. R. and L. H. Russwurm. "The Impact of Non-farm Development on Agriculture - A Synthesis," *Plan Canada*, 19 (1979), 122-39.
12. Carpenter, E. H. "The Potential for Population Dispersal: A Closer Look at Residential Location Preferences," *Rural Sociology*, 42 (1977), 353-70.
13. Clark, R. T. "Transferable Development Rights: Some Problems in Evaluation," in D. Soreson and H. Stogener, (eds.), *Economic Issues in Land Use Planning*. Corvallis, Oregon: Western Rural Development Center, Oregon State University, 1977, 79-88.
14. Clawson, M. "Urban Sprawl and Speculation in Suburban Land," *Land Economics*, 38 (1962), 99-111.
15. Clawson, M. "Economic Implications of the Recent Population Shift Toward Rural Areas," *American Journal of Agricultural Economics*, 58 (1976), 963-66.
16. Dahms, F. A. *Historical Background, Population Change and Agriculture: Wellington County, 1840-1976*. Vol. 1A *Statistical and Cartographic Survey*. Studies in Rural Adjustment, Report No. 7. Guelph, Ont.: Department of Geography, University of Guelph.
17. Davidson, J. and G. P. Wibberley. *Planning the Rural Environment*. Urban and Regional Planning Series, Vol. 18. London: Pergamon, 1977.
18. De Jong, G. "Residential Preferences and Migration," *Demography*, 14 (1977), 169-78.
19. Dowell, D. E. and J. B. Juhasz. "Trade-off Surveys in Planning: Theory and Application," *Environment and Planning A*, 10 (1978), 125-36.
20. Fesenmaier, D. R., M. F. Goodchild and S. Morrison. "The Spatial Structure of the Urban Fringe: A Multivariate Approach," *Canadian Geographer*, 23 (1979), 255-65.
21. Frankena, M. W. and D. T. Scheffman. *Economic Analysis of Provincial Land Use Policies in Ontario*. Toronto: Ontario Economic Council, University of Toronto Press, 1980.
22. Friedmann, J. and J. Miller. "The Urban Field," *Journal of the American Institute of Planners*, 31 (1965), 312-20.
23. Fuguitt, G. V. and J. J. Zuiches. "Residential Preferences and Population Distribution," *Demography*, 12 (1975), 491-504.
24. Gertler, L. and G. Crowley. *Changing Canadian Cities: The Next Twenty-five Years*. Toronto: McClelland and Stewart, 1977.
25. Gibson, J. A. "On the Allocation of Prime Agricultural Land," *Journal of Soil and Water Conservation*, 32 (1977), 271-75.
26. Gierman, D. M. and J. Lenning. *Rural to Urban Land Conversion*. Environment Canada, Lands Directorate, Map Folio No. 5., 1980.
27. Glenn, N. D. and L. Hill, Jr. "Rural-Urban Differences in Attitudes and Behavior in the United States," *Annals of the American Academy of Political and Social Sciences*, 429 (1977), 36-50.
28. Goldstein, S. "Urban and Rural Differences in Consumer Patterns of the Aged," *Rural Sociology*, 31 (1966), 333-45.
29. Gordon, P. "Deconcentration Without a 'Clean Break'," *Environment and Planning A*, 11 (1979), 281-90.
30. Greenwood, M. J. "Research on Internal Migration in the U.S.: A Survey," *Journal of Economic Literature*, 13 (1975), 397-434.
31. Hart, J. F. "Urban Encroachment on Rural Areas," *The Geographical Review*, 66 (1976), 1-17.
32. Harvey, R. D. and W. A. V. Clark. "The Nature and Economics of Urban Sprawl," *Land Economics*, 41 (1965), 1-9.



33. Heady, E. O. and U. K. Srivastava. *Spatial Sector Programming Models in Agriculture*. Ames, Iowa: Iowa State University Press, 1975.
34. Healy, R. G. *Land Use in the States*. Resources for the Future. Baltimore: Johns Hopkins University Press, 1976.
35. Hennigh, L. "The Good Life and the Taxpayers' Revolt," *Rural Sociology*, 43 (1978), 178-90.
36. Hobbs, D. "Providing Public Services in Rural Areas," *Journal of Soil and Water Conservation*, 29 (1974), 34-36.
37. Hodge, G. "The City in the Periphery," in L. S. Bourne, R. D. McKinnon, J. Siegel and J. W. Simmons, *Urban Futures for Central Canada*. Toronto: University of Toronto Press, 1974, 281-301.
38. Hodge, G. and M. A. Qadeer. *Towns and Villages in Canada: The Importance of Being Unimportant*. Kingston, Ontario: Queen's University Press, 1978.
39. Hoinville, G. "Evaluating Community Preferences," *Environment and Planning*, 3 (1971), 33-50.
40. Hovinen, G. R. "Leapfrog Developments in Lancaster County: A Study of Residents' Perceptions and Attitudes," *Professional Geographer*, 29 (1977), 194-99.
41. Isberg, G. "Controlling Growth in the Urban Fringe," *Journal of Soil and Water Conservation*, 28 (1973), 155-61.
42. Johnson, J. H. "Geographical Processes at the Edge of the City," in J. H. Johnson (ed.), *Suburban Growth*. London: Wiley, 1974, 1-16.
43. Joseph, A. E. and B. E. Smit. "Preferences for Municipal Public Services Amongst Rural Residents," K. B. Beesley, and L. H. Russwurm (eds.), *The Rural-Urban Fringe: Canadian Perspectives*. Toronto: York University Geographical Monographs, 1981, 446-460.
44. Krueger, R. R. "The Rural-Urban Fringe Taxation Problem: A Case Study of Louth Township," *Land Economics*, 32 (1957), 264-69.
45. Krueger, R. R. "Urbanization of the Niagara Fruit Belt," *The Canadian Geographer*, 22 (1978), 179-94.
46. Martin, L. R. G. *A Comparative Urban Fringe Study Methodology*. Ottawa: Lands Directorate, Environment Canada, 1975.
47. McCrae, J. D. *The Influence of Exurbanite Settlement on Rural Areas: A Review of the Canadian Literature*. Ottawa: Lands Directorate, Environment Canada, 1980.
48. Michie, G. H. and W. C. Found. "Rural Estates in the Toronto Region," *Ontario Geography*, 10 (1976), 15-26.
49. Middleton, R. and C. Grigg. "Rural-Urban Differences in Aspirations," *Rural Sociology*, 24 (1959), 347-54.

50. Miller, R. J. and G. R. Arthur. *An Overview of Rural Subdivision in Alberta*. Summary Report No. 4B. Edmonton: Alberta Land Use Forum, 1974.
51. Pahl, R. E. *Urbs in Rure: The Metropolitan Fringe in Hertfordshire*. London School of Economics and Political Science, Geographic Papers No. 2, 1965.
52. Patton, C. V. and K. E. Stabler. "The Small Town in the Urban Fringe: Conflicts in Attitudes and Values," *Journal of the Community Development Society*, 10 (1979), 84-93.
53. Pearson, N. F. *The Effect of Urbanization on Agricultural Land*. Publication No. 65. Guelph, Ontario: University of Guelph, Centre for Resources Development, 1972.
54. Ploch, L. A. "The Reversal in Migration Patterns - Some Rural Development consequences," *Rural Sociology*, 43 (1978), 293-303.
55. Pryor, R. J. "Defining the Urban Fringe," *Social Forces*, 47 (1968), 202-15.
56. Qadeer, M. A. "Issues and Approaches of Rural Community Planning in Canada," *Plan Canada*, 19 (1979), 106-21.
57. Robinson, I. M., W. D. Baer, T. K. Banerjee and P. G. Flachbart. "Trade-off Games," in W. Michaelson, (ed.), *Behavioural Research Methods in Environmental Design*. Stroudsburg: Dowden, Hutchinson and Ross, 1975.
58. Rodd, R. S. "The Crisis of Agricultural Land in Canada," *Plan Canada*, 16 (1976), 160-70.
59. Rodd, R. S. and W. Van Vuuren. "A New Methodology in Countryside Planning," *Canadian Journal of Agricultural Economics* (1975), C. A. E. S. Workshop Proceedings.
60. Rogers, D. L. and L. R. Whiting (eds.), *Aspects of Planning for Public Services in Rural Areas*. Ames, Iowa: North Central Regional Center for Rural Development, Iowa State University, 1976.
61. Russwurm, L. H. "Country Residential Development and the Regional City Form in Canada," *Ontario Geography*, 10 (1976), 79-96.
62. Schnore, L. F. "The Separation of Home and Work," *Social Forces*, 32 (1954), 336-43.
63. Schwarzweller, H. K. "Migration and the Changing Rural Scene," *Rural Sociology*, 44 (1979), 7-23.
64. Shaw, J. M. (ed.). *Rural Planning and Development*. Norwich, England: GeoAbstracts, 1979.
65. Short, J. R. "Residential Mobility," *Progress in Human Geography*, 2 (1978), 419-47.
66. Smit, B. E. "Prime Land, Land Evaluation and Land Use Planning," *Journal of Soil and Water Conservation*, 36 (1981), 209-212.
67. Smit, B. E. and M. F. Flaherty. "Preferences for Rural Land Severance Policies: An Empirical Analysis," *The Canadian Geographer*, 24 (1980), 165-76.



68. Smit, B. E. and M. F. Flaherty. "Resident Attitudes Toward Exurban Development in a Rural Ontario Township," *Professional Geographer*, 33 (1981), 103-12.
69. Smit, B. E. and Research Team. *Procedures for the Long-Term Evaluation of Rural Land*. Publication No. 105. Guelph, Ontario: University of Guelph, Centre for Resources Development, 1981.
70. Thomas, D. "Problems of Planning the Rural-Urban Fringe, with Special Reference to London," *Geographia Polonica*, 24 (1972), 81-94.
71. Vining, D. R. and A. Strauss. "A Demonstration that the Current Deconcentration of Population in the U. S. is a Clean Break with the Past," *Environment and Planning A*, 9 (1977), 751-58.
72. Wehrwein, G. S. "The Rural-Urban Fringe," *Economic Geography*, 18 (1942), 217-28.
73. Weeks, S. B. "Rural Ruination or Rural Renaissance: The Choices and Chances," *Small Town*, 6 (1976), 4-6.
74. Westhues, K. *Village in Crisis*. Toronto: Holt, Reinhart and Winston, 1974.
75. Wibberley, G. P. "Conflicts in the Countryside," *Town and Country Planning*, 40 (1972), 259-64.
76. Wibberley, G. P. "Development in the Countryside," *Journal of Environmental Management*, 2 (1974), 177-214.
77. Williams, A. S. "Planning Service Delivery Systems for Rural Sparcely Populated Areas," in D. L. Roger and L. R. Whiting (eds.), *Aspects of Planning for Public Services in Rural Areas*. Ames, Iowa: North Central Regional Center for Rural Development, Iowa State University, 1976.
78. Williams, J. D. and A. J. Sofranko. "Motivations for the Immigration Component of Population Turnaround in Non-metropolitan Areas," *Demography*, 16 (1979), 239-55.
79. Wilson, R. L. "Livability in the City: Attitudes and Urban Developments," in F. S. Chapin and S. Weiss (eds.), *Urban Growth in a Regional Cluster of Cities*. New York: Wiley, 1962.
80. Wiltshire, R. J. *Analysis of Recent Rural Land Transactions Within the Toronto Centered Region Involving Buyers and from Metropolitan Toronto*. Toronto: York University, 1973.
81. Wolfe, J. S. "Evaluation by Objectives: A Case Study and Commentary on Public Participation," *Plan Canada*, 19 (1979), 38-48.