PRELIMINARY LAND STUDY - BIBLIOGRAPHY

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April 1971..

B I B L I O G R A P H Y

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1. BOOKS AND ARTICLES - Elizabeth Hay

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e.g. A-1-2 Article, abstracted, CMHC library

A. POLICY AND PLANNING

I Patterns and Techniques of Planning

B-0-2 Abrams, Charles. Mans Struggle for Shelter in an Urbanizing World. (Cambridge: M.I.T. Press, 1964) 199 pp.

- surveys housing policy and problems internationally.

B-0-0 A.C.I.R. Urban and Rural America: Policies for Future Growth. The Advisory Commission on Intergovernmental Relations. (Washington, D.C.: U.S. Government Printing Office, 1968).

- summary given in Heeter, D. "Toward a More Effective Land-Use Guidance System: A summary and analysis of 5 major reports."

B-0-0 A.L.I. A Model Land Development Code. (Philadelphia: The American Law Institute, 1968).

- summary given in Heeter, David. "Toward a More Effective Land Use Guidance System: A summary and analysis of 5 major reports."

B-0-0 Arnott, Gordon R. and Associates. Site Planning for Multi-Family Housing - A Comparative Study of Land Use and Land Use Planning. (Regina, Saskatchewan: 1968).

B-0-0 A.S.P.O. New Directions in Connecticut Planning Legislation The American Society of Planning Officials (1967) out of print.

- summary given in Heeter, David. "Toward a More Effective Land Use Guidance System: A summary and analysis of 5 major reports."

B-0-0 Baker, A.M. Models of Spatial Behaviour in Urban Environments. Component Study 3 (Toronto: Centre for Urban and Community Studies, University of Toronto, August 1969).

B-0-0 Barber, G. and Bourne, L.S. Structure and Process in Small Urban Centres: A Test of Some Preliminary Hypothesis. Component Study 3 (Toronto: Centre for Urban and Community Studies, University of Toronto, September 1969).

A-0-0 Berry, Brian J.L. "A note concerning methods of classification," Annals of the American Association of Geographers. Vol. 48, 300-303 pp.

A-1-2 Blumenfeld, Hans. "Are Land Use Patterns Predictable?" Journal of the American Institute of Planners. Vol. 25, No. 2 (May 1959), pp. 61-66.

- notes on Manhattan study.
- history of urban land theory.

B-0-0 Bosselman, Fred P. Alternatives to Urban Sprawl: Legal Guidelines for Governmental Action. (Washington, D.C.: U.S. Government Printing Office, 1968), 69 pp.

A-0-0 Bourne, Larry S. "A Spatial Allocation - Land Use Conversion Model of Urban Growth", Journal of Regional Science, Vol. 9 (1969), pp. 261-272.

- standard spatial allocation model of urban land development modified by placing emphasis on central city building trends and locational patterns.
- also a 'conversion sub-model' introduced to measure the nature and scale of land-use succession through new construction.

A-1-2 Callard, William B. "Traffic Forecasting for Freeway Planning", Journal of the American Institute of Planners, Vol. 2, No. 2 (May 1959) pp. 82-86.

- San Diego Traffic Model based on land use.

A-0-2 Chapin, F. Stuart. "Activity Systems and Urban Structure: A Working Schema". Journal of the American Institute of Planners Vol. 34 (January 1968), pp. 11-18.

- traditional economic approaches may not be adequate theoretical tools for urban analysis, as non-material interests increasingly important to "urban dwellers".
- purposes "motivation - choice - activity" model, within four temporal systems (hourly, daily, monthly, yearly routines) as descriptive of urban lifestyle.

Why does family move? (individual and aggregate)
- motivation provides threshold
- motivation - to move (push factors)
  - where to move (pull factors)
- links behavioral and physical planning

B-0-2 Chapin, F. Stuart. Urban Land Use Planning (Urbana: University of Illinois Press, 1965).

- primary planning textbook.

B-0-0 Chapin, F. Stuart Jr. and Weiss, Shirley. Urban Growth Dynamics in a Regional Cluster of Cities. (New York: John Wiley and Sons, 1962).

- North Carolina study.

A-0-2 Chapin, F. Stuart, Jr. "A Model for Simulating Residential Development,"Journal of the American Institute of Planners, Vol. 31 (1965), pp. 120-125.

- outlines his 'consumer model' for household location
- explains how it will operate within the constraint of the 'producer model'.

B-0-C Coke, James G. and Gargan, John J. Fragmentation in Land-Use Planning and Control. (Washington, D.C.: U.S. Government Printing Office, 1969), 91 pp.

A-1-1 Crecine, John P. "Computer Simulation in Urban Research," Public Administration Review , Vol. 28 (1968), pp. 66-77.

- surveys major urban models.

B-0-0 Curtis, Virginia (ed) Land Use Policies. (Chicago: American Society of Planning Officials, 1970), 77 pp.

- series of seven papers suggesting first steps in devising national, state and local urban policies relating to:

1) land acquisition and tax policies
2) implementing national and metropolitan land-use policies
3) retooling land-use controls
4) development of new towns

B-0-0 Douglas Commission. Building the American City. The National Commission on Urban Problems. (Washington, D.C.: U.S. Government Printing Office, 1968).

- summary given in Heeter, D. Toward a More Effective Land Use Guidance System: A summary and analysis of 5 major reports.

A-0-0 Drewett, J.R. "A Stochastic Model of the Land Conversion Process: An Interim Report," Regional Studies. Vol. 3 (1969), pp. 269-280.

- general discussion of systems approach to urban studies.
- stochastic model used to predict changes in the system from empirically derived 'state at time one'; this compared with actual growth and residuals studied.

A-1-1 Dunn, Edgar S. Jr. "A Flow Network Image of Urban Structures", Urban Studies. Vol. 7, No. 3 (October 1970), pp. 239-258.

- begins reconciliation of boundary networks (central place theory) and flow networks (location theory) and transportation analysis.

B-0-2 Edwards, Gordon. Land, People and Policy. The Problems and Techniques of Assembling Land for the Urbanization of 100 million New Americans. (West Trenton, N.J.: Chandler-Davis Publishing Co., 1969).

A-0-0 Garner, B.J. "Models of Urban Geography and Settlement Location" Chapter 9 in Chorley, R.J. and Haggett, P. Socio-Economic Models in Geography. (London: Methuen, 1967), pp. 303-360.

A-0-0 Garrison, W.L. "Towards Simulation Models of Urban Growth and Development", Land Studies in Geography, Vol. 24 (1962), pp. 92-108.

A-0-0 Garrison, William L. "Difficult Decisions in Land Use Model Construction," Highway Research Record, No. 102. (Washington Highway Research Board, 1965), pp. 42-53.

Two problem areas in land use modelling are discussed in detail: (1) inclusion of notions about behaviour, and (2) decisions concerning structure. Garrison argues that in the development of any model, decisions must be made about the kind of behaviour that will be replicated, and that such decisions are both difficult and critical. In particular, decisions about the level of aggregation at which a topic will be treated are important, and planning behaviour should be included.

A-0-0 Greer-Wootten, Bryn. "Cross-Sectional Social Area Analysis: Montreal, 1951-1961." Unpublished report, McGill University, 1968. 18 pp.

- preliminary report of a social area analysis of Montreal, using 27 variables measured for 281 'study areas', mostly census tracts. Image analysis, a factor-analytic technique, is used in the study.

B-0-2 Haar, Charles M. Land-Use Planning - A Casebook of the Use, Misuse and Re-use of Urban Land. (Toronto: Little, Brown and Co., 1959).

- legal study of planning in U.S.
- introduction is useful capsule of planning doctrines.

B-1-2 Haggett, Peter. Location Analysis in Human Geography. (London: Arnold, 1965).

- examines location models, especially spatial models
- 5 part typology: movement, networks, modes, hierarchies, sufaces
- links structure, function and process.

B-0-2 Hamilton, William A. Canadian Urban Development and the Economic Base Concept: 1931 to 1961. M.A. Thesis, Department of Geography, University of Waterloo (September 1970).

- unpublished
- available at CMHC, E. M. and R., and Univ. of Waterloo libraries.

B-0-0 Hamilton, Howard P. "Apartment Development Trends in Canada," A.I.M., Vol 9, No. 3 (1965), pp. 34-40.

Expected future demands of apartment dwellers are discussed in detail: more recreational area, landscaping, and amenities; better designed buildings; improved locational features; and more capable management. The impact of these trends on apartment developers is discussed.

A-O-2 Hansen, Walter G. "How Accessibility Shapes Land Use," Journal of the American Institute of Planners (Special Issue). (May 1959) pp. 73-76.

The abstract states in part that: "An empirical examination of the residential development patterns illustrates that accessibility and the availability of vacant developable land can be used as the basis of a residential land use model." The article suggests a method for determining accessibility patterns and the model offered attempts to distribute the total metropolitan population growth to smaller areas within the region. Access (to commercial, industrial, and commercial facilities) is defined in terms of the potential for opportunities for interaction. A hypothetical example is included.

A-O-O Harris, B. "New Tools for Planning", Journal of the American Institute of Planners. Vol. 31, No. 2 (May 1965).

- summary of planning models

B-O-O Harris, Curtis C., Jr. A Stochastic Process of Suburban Development. (Berkeley: University of California (Center for Real Estate and Urban Economics, Institute of Urban and Regional Development), Technical Report No. 1, 1966), 106 pp.

A detailed discussion of the model. Details of computations and rationale are given, and the author presents a critique of his model.

B-O-3 La Haye Commission. Urban Planning Act, Quebec (May 1970) English summary of the Report of the La Haye Commission on Town Planning. (I.C.U.R.R. No. 42).

B-O-2 Heeter, David. Toward a More Effective Land-Use Guidance System: A summary and analysis of 5 major reports. A.S.P.O. Planning Advisory Service Report No. 250. (Chicago: American Society of Planning Officials, 1969).

- review of five reports dealing with land
- Canadian report is Hellyer Task Force

B-O-2 Hellyer Task Force. Report of the Task Force on Housing and Urban Development. (Ottawa: Queen's Printer, 1969).

- summary given in Heeter, David. Toward a More Effective Land Use Guidance System: A summary and analysis of 5 major reports.

B-O-O Hemmens, George C., ed. Urban Development Models. (Washington, D.C.: Highway Research Board, Special Report 97, 1968), 266 pp.

This volume, the report of a 1967 conference on urban development models, provides a valuable state-of-the-art evaluation of land-use modelling, while looking forward to future developments. The whole

conference is excellently summarized by Britton Harris (pp. 3-17), and there are major contributions by Chapin, Leven, Lowry, and Alonso, among others. Chapin's contribution considers activity systems as inputs for land-use models.

A-1-2 Hill, Donald M. "A Growth Allocation Model in the Boston Region", Journal of the American Institute of Planners. Vol. 31, No. 2 (May 1965), pp. 111-119.

- dynamic program, total area simulation.

A-0-0 Hutchison, B.G. "A Review of Selected Land Use Models". Paper for workshop on Land Use Models. University of Waterloo, February 24, 1971.

B-1-2 Jacobs, Peter. Site Planning Process - Design Schema. (Halifax: Nova Scotia Technical College, 1970).

- proposes 2 expansion schema for Halifax Dartmouth.
- prepares models for evaluation.
- discusses policy relevance.

B-0-0 Kaiser Committee. A Decent Home. The President's Committee on Urban Housing. (Washington, D.C.: U.S. Government Printing Office, 1968).

- see Heeter, David. Toward a More Effective Land Use Guidance System: A summary and analysis of 5 major reports."

A-0-2 Kaiser Edward J. "Location Decision Factors in a Producer Model of Residential Development", Land Economics Vol. 44 (1968), pp. 351-362.

- argues that developer plays key role in determining the spatial distribution of residential growth
- empirical analysis provides evidence of importance of site characteristics.

A-0-0 Kaiser, Edward J. and Weiss, Shirley F. "Local Public Policy and the Residential Development Process", Law and Contemporary Problems. Vol. 32, No. 2 (Spring 1967), pp. 232-249.

- outlines their conceptual overview of the residential development process
- explains ways local public policy can influence decisions by (1) the predevelopment landowner (2) the developer (3) the household.

A-0-2 Kaiser, Edward J. and Weiss, Shirley F. "Public Policy and the Residential Decision Process," Journal of the American Institute of Planners. Vol. 36 (1970), pp. 30-37.

- decision model of the development process.
- assesses role of public policy decisions at each stage.

A-0-2 Kilbridge, Maurice A. "The Foundations of Urban Planning Models," Ekistics Vol. 26, No. 155 (October 1968), pp. 382-389.

- discusses limitations of present planning models as tools for theoretical inquiry, and planning process
- modelling can be a policy component
- preliminary discussion of decision-theory modelling.

B-0-0 Kilbridge, M., Oblock, R.P. and Tepletz, P.V. A Conceptual Framework for Urban Planning Models. Urban Analysis Project, Harvard Business School. (Boston: Harvard Press, June 1968).

A-1-1 Loewenstein, Louis K. "On the Nature of Analytical Models," Urban Studies. Vol. 13, No. 2 (June 1966), pp. 112-119.

- characteristics of models
- five model types defined

B-0-0 Lowry, Ira S. Migration and Metropolitan Growth: Two Analytical Models. (Los Angeles: Institute of Government and Public Affairs, University of California, 1966).

B-0-0 Lowry, Ira S. Seven Models of Urban Development: A Structural Comparison. National Research Council Conference on Urban Development Models, Dartmouth College, Hanover, N.H. (June 1967).

B-0-0 Maisel, Sherman J. California Housing Studies. (Berkeley: Center for Planning and Development Research, University of California, 1963), 230 pp.

- book contains two studies: Maisel, S.J. "Land Costs for Single Family Housing".
  - examines cost of housing and its components
  - data on land values analyzed and presents a statement of the theory of how land values are determined in current markets
  - examines government intervention and factors influencing supply and demand.

  "Housing Trends and Related Problems," Foley, D. et al.
  - examines effect of the shifting metropolitan spatial patterns on housing market.

A-0-0 Malm, Roger, Olsson, G. and Wärneryd, Olaf. "Approaches to Simulations of Urban Growth." Geography An., Vol. 48 B (1966), pp. 9-22.

- begins with generalized discussion of problems in modelling spatial phenomena and a review of models.
- outlines model for simulating growth of Gothenburg using probabilities derived from projected construction costs.
- takes into account proximity and 'slope preferences'.
- suggests appropriate test techniques, especially quadrat analysis.

A-0-0 Maxwell, James W. "The Functional Structure of Canadian Cities: A Classification," Geographical Bulletin Vol. 7, No. 2 (1965), 79-104.

- using measures of the employment structure, cities are grouped into various functional types.

A-0-0 Morrill, Richard L. "Expansion of the Urban Fringe: A Simulation Experiment," Papers and Proceedings of the Regional Science Association. Vol. 15 (1965), pp. 185-199.

- simulates of Seattle's urban fringe, 1957-64
- assumes that fringe development is a spatial diffusion process, random in direction but following an inverse probability distribution with variations on land and neighbourhood quality.

A-0-0 Muth, Richard F. "The Spatial Structure of the Housing Market", Papers and Proceedings of the Regional Science Association. Volume 7. (1961), pp. 207-20.

- simple theory of the spatial structure of the housing market based on economic equilibrium theory.

A-0-0 Muth, Richard F. "Economic Change and Rural-Urban Land Conversion", Econometrica.Volume 29 (1961), pp. 1-23.

B-1-2 Ottoson, Howard W. (ed) Land Use Policy and Problems in the United States. (Lincoln: University of Nebraska Press, 1963).

- anthology of summary articles in American land field.
- slightly historical.

A-1-2 Passow, Shirley S. "Land Reserves and Teamwork in Planning Stockholm," Journal of the American Institute of Planners. Vol. 36, No. 3 (May 1970), pp. 178-188.

- history of Swedish urban land banking and land use planning program.

A-0-0 Ratcliffe, Richard U. and Schwab, Bernhard. "Contemporary Decision Theory and Real Estate Investment". Appraisal Journal. Vol. 38 (1970), pp. 165-187.

- explains essential concepts of modern decision theory
- discusses discount rates and use of probabilities in decisions and uncertainty.

A-0-0 Ray, D. Michael, "Urban Growth and the Concept of Economic Region," Paper delivered to the Canadian Political Science Association, Ottawa Chapter (January 1966) mimeo.

A-1-2 Schlager, Kenneth J. "A Land Use Plan Design Model", Journal of the American Institute of Planners, Vol. 31, No. 2 (May 1965), pp. 103-111.

- dynamic model
- limited information on input data

B-O-2 Schnore, Leo F. and Fagin, Henry. Urban Research and Policy Planning (Beverly Hills, Calif.: Sage Publications, 1967).

A-1-1 Simmons, James W. "Descriptive Models of Urban Land Use", Canadian Geographer. Vol. 9, No. 3 (1965), pp. 170-174.

- criticism of main spatial models (concentric, sector and multi-nuclei)
- concentric (socio) and sector (economic) patterns are descriptive of people not land
- can't predict land-use location

B-O-O Simmons, James W. Flows in an Urban Area: A Synthesis. Research Report No. 6. (Toronto: University of Toronto Centre for Urban and Community Studies, 1968). 49 pp.

This monograph reviews and synthesizes that segment of the literature pertaining to the title. It is hoped that an understanding of the nature of flows, mobility and interaction (within and between cities) will allow for greater comprehension of urban structure and change. Subject matter includes a discussion of matrix analysis as applied to the subject (e.g. Factor Analysis and Markov processes).

A-1-2 Stegman, Michael A. "Accessibility Models and Residential Location," Journal of the American Institute of Planners. Vol. 35, No. 1 (January 1969), pp. 22-29.

- households locate for activity, quality reasons, not accessibility and price.

B-O-O Steinitz, C. and Rogers, P. A Systems Analysis Model of Urbanization and Change. Graduate School of Design, Harvard University (Cambridge, Mass.: 1968).

B-O-O Steinitz, C. et al. A Comparative Study of Resource Analysis Methods. Graduate School of Design, Harvard University (Cambridge, Mass.: 1969).

B-O-O Twin City Metropolitan Planning Commission. Selected Determinants of Residential Development. Minneapolis-St. Paul: MPC (Background Document No. 1), 1962, 45 pp.

- identifies three key groups in development process: builder, lender and consumer
- concludes that increased information and stability, clear public goals, and more development capital needed
- explains patterns and locations of subdivisions as resulting from development and land costs but stresses that "timing and sequence of development have far more effect on community's well-being than pattern or location of development."

A-1-2 Voochees, Alan M. "The Nature and Uses of Models in City Planning," Journal of the American Institute of Planners. Vol. 25, No. 2 (May 1959).

- primary concern is evaluative aspects of modelling.

B-0-0 Watt, K.E.F. The Land-Use and Energy Flow Component of a Mathematical Model of California. Research Grant Application, National Science Foundation (1969).

B-0-0 Weiss, Shirley F. et al. Residential Developer Decisions (Chapel Hill: University of North Carolina, Centre for Urban and Regional Studies, 1966), 94 pp.

- gives detailed conceptual overview of residential land development process.
- investigates the whole pattern of urban activities over time and space.

A-0-0 Wheaton, William L.C. "Public and Private Agents of Change in Urban Expansion", in Webber, Melvin M., Explorations into Urban Structure (Philadelphia: University of Pennsylvania Press, 1964).

- examines decision agents in urban expansion
- concentrates specifically on investment decisions.

B-0-2 Wheeler, Michael (ed) The Right to Housing (Montreal: Harvest House, 1969).

- introduces Canadian land policy

B-0-0 Wilbanks, Thomas J. Some Observations on Land Use Decisions and Development Planning. Department of Geography, Seminar Paper Series A:18 (Bristol, England: University of Bristol, December 1968), 33 pp.

- develops conceptual framework for agricultural land use decisions using a cost-benefit approach.

A-1-1 Wilson, A.G. "Models in Urban Planning: A Synoptic Review of Recent Literature", Urban Studies, Vol. 5, No. 3 (November 1968), pp. 249-276

- synopsis of all planning models.

A-1-1 Wright, R.W. "Housing as an Instrument of Social Policy", Journal of Canadian Studies. Vol. 4, No. 2 (March 1969).

II Controls on Land Use

(i) General

B-1-2 Adler-Karlsson, Gunnar. Reclaiming the Canadian Economy: A Swedish Approach Through Functional Socialism. (Toronto: Anansi, 1970).

- discusses limitations in title to property (functions) to control use.

B-1-2 Aykroyd, Peter H. Land Use Control in Britain, the United States and Canada. (Ottawa: 1969).

- brief survey of history of land use controls
- section on O.M.B. and its failings.

A-0-2 Clawson, Marion. "Suburban Development Districts," Journal of the American Institute of Planners, Vol. 26 (1960), pp. 69-83.

- discussion of government influences over suburban land development; concerned with controlling the form, direction and character of suburban growth.

B-0-0 Delafons, John. Land Use Controls in the United States. (Cambridge: Joint Centre for Urban Studies of M.I.T. and Harvard University, 1962).

A-1-2 Kelso, M.M. "Resolving Land Use Conflict," in Ottoson, Land Use Policy and Problems in the U.S. (1963). pp. 282-303.

- dichotomizes land problems as public-private
- resolution once purely in market place (i.e. price)
- now quasi-market resolution (i.e. price factor clouded by taxes, zoning, etc.).

B-0-0 Milner, J.B. Development Control: some less tentative proposals. (Toronto: Ontario Law Reform Commission, May 1969), 52 pp.

- includes both zoning and subdivision control under development control
- examines roles and problems of zoning by-law.

A-0-1 United Nations, Urban Land Use Policies and Land Control Measures Study, Experts Group Meeting (Nov 30 - Dec 4, 1970). The following mimeo papers:

Amato, Peter W. "Urban land Policies and Urban Land Control Measures in the United States."

Corynski, Juliusz and Rybicki, Zygmunt. "Urban Land Policy and Land Control Measures in Poland."

Darin - Drabke, H. "Urban Land Use Policies and Land Control Measures in Western Europe."

Hardoy, Jorge E. "Urban Land Policies and Land Use Control Measures in Cuba."

Hardoy, Jorge E. "Urban Land Policies and Land Use Control Measures in Dominican Republic."

Hardoy, Jorge E. "Urban Land Policies and Land Use Control Measures in Haiti."

Hardoy, Jorge E. "Urban Land Policies and Land Use Control Measures in Jamaica."

Hardoy, Jorge E. "Urban Land Policies and Land Use Control Measures in Mexico."

Hardoy, Jorge E., Basaldu a, Raul Oscar, Moreno, Oscar A. "Urban Land Policies and Urban Land Control Measures in South America."

Makirere Institute of Social Research. "Urban Land Policies and Land Use Control Measures in Africa."

National Swedish Council for Building Research. "Urban Land Policies and Land Use Control Measures in Sweden."

Sah, J.P. "Urban Land Policies and Land Use Control Measures in Ecafe Region."

Wan, Teh Cheang. "Urban Land Policies and Land Use Control Measures in Singapore."

United Nations Economic and Social Office, Beirut. "Urban Land Policies and Problems in Selected Countries of the Middle East."

United Nations, Urban Land Use Policies and Land Control Measures. Recommendations for Developing Countries.

United Nations, Urban Land Use Policies and Land Control Measures Study. Report of the Expert Group.

- summary of discussion and conclusions of meeting.

B-0-2 Whyte, W.H. The Last Landscape. (Garden City: Doubleday and Co. 1968).

- discusses use of innovative controls on land, particularly easements.

(ii) Taxation

A-0-2 Beecroft, Eric et al. "Site Valuation as a Base for Local Taxation," Reprinted from the Report of the 1961 Conference of the Canadian Tax Foundation. (Montreal: Canadian Federation of Mayors and Municipalities, 1961).

- critical of site value taxation.

B-1-0 Beeman, William Joseph. The Property Tax and the Spatial Pattern of Growth Within Urban Areas. Research Monograph No. 16. (Washington, D.C.: Urban Land Institute, 1969).

- study to determine "does tax pattern affect growth pattern?"
- no, but among municipalities in an area, yes.

B-1-2 Calgary, City of. Site Taxation Report (Calgary: Calgary Assessment Department, 1962).

- studies changes in taxation in Calgary if Site Value Taxation were introduced
- tax shifts from residential to C.B.D., commercial and industrial, but at expense of low income persons everywhere.

A-0-0 Finnis, F.H. "Site Valuation and Local Government," Canadian Tax Journal, Vol. 11 (1963), pp. 118-126.

B-0-0 Finnis, F.H. Real Property Assessment in Canada. (Toronto: Canadian Tax Foundation, 1962).

A-1-2 Gaffney, Mason. "Land Planning and the Property Tax", Journal of the American Institute of Planners, Vol. 35, No. 3(May 1969), pp. 178-183.

- supports site value tax
- vehicle to recapture public investment

A-0-1 McKay, R.J. "Tax Considerations in the Acquisition and Ownership of Real Estate," Appraisal Institute Magazine Vol. 7, No. 2 (1963), pp. 5-14.

- detailed discussion of the effects of Canadian income tax legislation on land holding and acquisition costs.

B-0-0 Netzer, D. Economics of the Property Tax. (Washington, D.C.: Brookings Institute, 1966).

B-0-0 Netzer, Dick. Impact of the Property Tax (Washington, D.C.: U.S. Government Printing Office, 1968), 48 pp.

B-0-0 Ontario Committee on Taxation Report, 1967 (Toronto: Queen's Printer, 1968) 3 volumes. Chairman: Lancelot J. Smith.

- catalogues failures of property tax system.

B-0-0 Pickard, Jerome P. Changing Urban Land Uses as Affected by Taxation. Research Monograph No. 6. (Washington, D.C.: Urban Land Institute, 1962).

- inconclusive

B-0-0 Pickard, Jerome P. Taxation and Land Use in Metropolitan and Urban America. Research Monograph No. 12 (Washington, D.C.: Urban Land Institute).

A-1-0 Plunkett, Thomas J. Taxation and Land Development. Address to National Planning Conference, A.S.P.O., Atlantic City, N.J., April/May 1962.

- site value taxation
- cannot be clearly directed, won't focus on speculators, slum landlords or business property alone.

B-0-0 Rawson, Mary. Property Taxation and Urban Development. Research Monograph No. 4 (Washington, D.C.: Urban Land Institute, 1961).

- finds taxes about 75/25 - building/land
- shifting assessment to land would create pressure on land price system to decrease assessment.

B-0-0 Sakolski, Aaron M. Land Tenure and Land Taxation in America. (New York: Robert Schalkenback Foundation, 1957).

B-0-0 Wiles, Franklin. Land Development and Taxation in a Central Commercial Zone. (Vancouver: June 1965).

B-0-0 Wehrly, M.S. and McKeever, J.R. Urban Land Use and Property Taxation, Urban Land Institute, Technical Bulletin No. 18, (1952).

(iii) Zoning

A-0-0 Adler, Gerald M. "Participant Involvement and an Analysis of Factors in Land Use Decision Making: A Methodological Approach", Western Ontario Law Review. Vol. 7 (1968).

- computer study of O.M.B. decisions by participant factor analysis.

B-0-0 A.S.P.O. Problems of Zoning and Land-Use Regulations. (Washington, D.C.: American Society of Planning Officials, 1968), 80 pp.

B-0-0 Babcock, R.F. The Zoning Game. (Madison: University of Wisconsin Press, 1966).

A-0-0 Davis, O.A. and Winston, A.B. "The Economics of Complex Systems: The Case of Municipal Zoning", Kyklos. Vol. 17, No. 3 (1964).

B-1-1 Laval, City of. A Dynamic and Scientific Approach to Residential Zoning. (Laval: Service d' Urbanisme de Laval, 1970).

- study of "Land Use Intensity" system of zoning
- said to increase livability
- offers increased analysis capability

B-0-0 Marcus, Norman & Groves, Marilyn. The New Zoning: Legal, Administrative, and Economic Concept and Techniques (New York: F.A. Praeger, May 1970), 263 pp.

- papers and proceedings from a conference on zoning, May 1969.
- emphasis of conference on innovative zoning concepts and techniques and their influences on the growth of large cities.

A-1-1 Milner, J.B. "An Introduction to Zoning Enabling Legislation," Canadian Bar Review. Vol. 40, No. 1 (March 1962), pp. 1-56.

- describes zoning legislation in 10 provinces
- 3 zoning approaches - piecemeal, comprehensive and dev. control.

B-0-0 Natoli, Salvatore, J. Effects of Zoning Upon the Development of Urban Land Use Patterns: A Case Study of Worcester, Massachusetts (unpub. Ph. D. thesis, Worcester: Clark University, Department of Geography, 1967).

B-0-0 Raymond and May Associates. Zoning Controversies in the Suburbs: Three Case Studies. (Washington, D.C.: U.S. Government Printing Office, 1968), 82 pp.

B-1-1 R.A.I.C. Reflections on Zoning. (Ottawa: Royal Architectural Institute of Canada, 1964).

- zoning detrimental to creative development, but has important regulative function
- suggests "development control"
- minimum standards preferable to specific zoning

B-1-2 Willhelm, Sidney M. Urban Zoning and Land Use Theory (New York: Free Press of Glencoe, 1967).

- analysis of 'voluntaristic' vs. 'materialistic' (theory) approaches to zoning
- illustrates with zoning decisions in Austin
- zoning not an "independent" determining factor for controlling land use.

A-0-0 Williams, Norman J. "Land Use and Zoning" in Approach to Urban Planning (Princeton, N.J.: Princeton University Press, 1953), pp. 38-53.

A-0-0 Yeates, Maurice H. "The Effect of Zoning on Land Values in American Cities: A Case Study", in J.B. Whitlow and P.B. Woods (eds) Essays in Geography for Austin Miller. (Reading: 1965), pp. 317-33.

- studies effect of commercial zoning on land values in adjacent areas
- finds zoning is important but not necessarily causal
- a different set of spatial forces operate on land values depending on zoning category.

(iv) Subdivision

B-0-0 British Columbia, University of Residential Land Subdivision, a Physical Evaluation. Staff Research Project No. 2. (Vancouver: School of Community and Regional Planning, University of British Columbia, 1965), 155 pp.

A-0-0 Kaiser, E.J. A Producer Model for Residential Growth. Research Monograph (Chapel Hill: University of North Carolina, 1968).

- regression study of location of land subdividing
- finds subdividing occurs when site:
  - close to school, employment
  - has high level of zoning protection
  - available to public utilities
  - closer to major roads
  - proximity to residential development and C.B.D.

A-1-2 Milner, J.B. "An Introduction to Subdivision Control Legislation", Canadian Bar Review Vol. 43, No. 1 (March 1965), pp. 49-98

- subdivision control, by province
- specific discussions of public land, servicing, streets, CMHC controls

B-0-0 Pearson, Norman. What Price Suburbia. (New Westminster, B.C.: Lower Mainland Regional Planning Board, 1967), 30 pp.

- examination of the costs entailed by scattered subdivision on the rural-urban fringe.
- detailed calculations of servicing costs for different densities of single family residential development undertaken.
- conclusion recommends tighter municipal control over development.

A-0-0 Yearwood, Richard M. "Land Subdivision and Development: American Attitudes on Land Subdivision and Its Controls," American Journal of Economics and Sociology. Vol. 29 (1970), pp. 113-126.

III Public Land

A-0-1 Caldwell, Lynton K. The Ecosystem as a Criterion for Public Land Policy", Natural Resources Journal Vol. 10, No. 2 (April 1970)

A-1-2 Clawson, Marion. "Public and Private Interest in Public Land," in Ottoson (ed) Land Use Policy and Problems in the United States. (1963), pp. 350-375.

- history of U.S. public land, "public good" concept
- professional public land managers tend to imperfectly use C-B analysis to incorrectly condemn public land.

A-0-0 Form, William H. "The Place of Social Structure in the Determination of Land Use: Some Implications for a Theory of Urban Ecology," Social Forces. Vol. 32 (May 1954), pp. 317-23.

A-0-0 Hosse, Hans A. "Ottawa's Greenbelt and Its Anticipated Effects," Canadian Geographer. No. 17 (1960), p. 35-40.

- describes efforts of the Federal government to control land use in the National Capital Region.

B-0-1 Huebert, Victor. Public Land-Use in London, Ontario. Thesis. University of Western Ontario (August 1967).

- studies federal, provincial, municipal and institutional holdings in London.

B-0-2 Niedercorn, John H. and Hearle, Edward R.R. Recent Land-Use Trends in Forty-Eight Large American Cities. (Santa Monica, California: Rand Corporation, 1963).

- proportion of urban land used in public and institutional activities is rising, although proportion in streets and roads declining
- overall, public land use increasing.

A-0-1 Perks, W.T. and Kapoor, B.N. Greenbelt Policy Study, National Capital Commission (February 5, 1970), mimeo

A-1-1 Simmons, James W. and Huebert, Victor H. "The Location of Land for Public Use in Urban Areas", Canadian Geographer, Vol. 14, No. 1 (Spring 1970), pp. 45-56.

- studies London, Ontario
- data on public land, which constitutes 20% of municipal area.

A-1-2 Stoddard, Charles M., Churchill, John R. and Harvey, D. Michael. "Planning the Federal Lands," Journal of the American Institute of Planners. Vol. 35, No. 1 (January 1969), pp. 44-48.

- need capability inventory of Federal land
- public land in U.S. becoming private, through condemnation and use.

B-0-2 Teitz, M.B. Toward a Theory of Urban Public Facility Location, Working Paper No. 67. Centre for Planning and Economic Research (Berkeley: University of California, 1967).

A-1-2 Wingo, Lowdon. "The Use of Urban Land" in Ottoson (ed) Land Use Policy and Problems in U.S. (1963) pp. 231-254.

- federal land policy difficult because urban land small percentage of national total, and state and local control strong.

B. LAND SPECULATION

A-1-1 Bryant, R.W.G. "Land Speculation: Its Effects and Control", Plan, Journal of the Town Planning Institute of Canada. Vol. 5 (1964-5), pp. 109-121.

- land is not normal commodity, but North American economy treats it so.
- profits in land at public expense and through public investment.
- recommends public control of development rights.

A-0-0 Bryant, R.W.G. Land Speculation, unpub. monograph. Université de Montréal.

B-0-3 Bryant, R.W.G. Uses and Abuses of Land Ownership. (unpublished book)

A-0-2 Chung, Joseph H. Land Market and Land Speculation. Published Thesis. Université de Montréal. (December 1969).

- study of speculation in Montreal area
- case study of "bid up" system

A-1-1 Clawson, Marion. "Urban Sprawl and Speculation in Suburban Land," Land Economics. Vol. 38 (1962), pp. 99-111.

- value must double in 10 years for speculator profit
- factors of land price, including interest rates
- factors of suburban land markets.

A-0-1 Derbes, Max J. Jr. "Use, Development or Speculation of Real Estate," Appraisal Journal. Vol. 32 (1964), pp. 219-229.

A-0-0 Elias, C.E. Jr. and Gillies, James. "Some Observations on the Role of Speculators and Speculation in Land Development," U.C.L.A. Law Review. Vol. 11 (1965), p. 789.

- speculation minimizes fluctuations in land prices, lowers prices over time, and promotes orderly urban growth and development.

A-0-1 Gayler, Hugh J. "Land Speculation and Urban Development: Contrast in South-East Essex, 1880-1940", Urban Studies. Vol. 7 (1970), pp. 21-36.

- discusses the development of new towns:
  - to take pressure off land
  - to help depressed areas
- optimal size of towns - 80,000 for public transportation facilities, etc.

A-1-1 Kaiser, Edward J. et al. "Predicting the Behaviour of Pre-development Land Owners on the Urban Fringe," Journal of the American Institute of Planners. (September 1968), pp. 328-333.

- presents a technique for assessing the likelihood that a parcel of nonurban use land on the urban fringe would be sold during

the next few years.
- presents landowner model
- combines landowner characteristics and property characteristics to yield probabilities of land being sold for urban development.

A-1-1 Kellough, W.R. and Beaton, Wallace. "Anatomy of the Housing Shortage," Community Planning Review (Spring 1969), pp. 19-26.

- discusses land speculation
- 5 components - inflation, mortgage, economic manipulation, inventory, local planning.

A-0-0 Langlois, Claude. "Problems of Urban Growth in Greater Montreal," Canadian Geographer Vol. 5, (1961), pp. 1-11.

- identifies four key factors influencing Montreal's urban growth 1945-1960:
  - site, bilingual culture, changing function, land speculation.

A-0-0 Langlois, C. "Speculation and Sprawl", The Canadian Geographer (1961)

B-1-2 Oshawa Area Planning and Development Study, Reports No. 1, 1 (A), 2 and 3. (Whitby, Ontario: APADS 1970).

- Oshawa regional planning study, highly computerized
- some speculation and optimal size data.

A-1-1 MacKay, Angus N. "Land Speculation - A Comment", Plan J.T.P.I.C. Vol. 6 (1965-6), pp. 82-94.

- competitive speculation stabilizes land markets.

B-0-0 Shoup, Donald. The Optimal Timing of Land Development (Los Angeles: The University of California, Institute of Government and Public Affairs, 1969), MR-123.

A-1-0 Showell, Brian. "Public Property Corporations," Appraisal Journal, Vol. 31 (1963), pp. 229-235.

- proposes public land purchasing corporation to compete against speculators and developers.

A-0-1 Vickers, Geoffrey, "The Uses of Speculation", Journal of the American Institute of Planners. Vol. 34 (1968), pp. 2-10.

- role of government vs. private sector in land use and distribution.

C. LAND ASSEMBLY

A-0-1 Armstrong, Alan. "Emerging Urban Land Policy in Canada". Notes for a colloquy on National Land Policies held by the American Society of Planning Officials, New York, April 8, 1970. (Ottawa: Canadian Council on Urban and Regional Research, April 1970).

- generalized discussion of recent land assembly practice in Canada.

A-0-2 Buckwold, S. "Land Policy in Saskatoon" Habitat Vol. 5, No. 1 (January-February 1962), pp. 2-5.

- historical review of land assembly activities in Saskatoon
- lacks detail

A-0-0 Drachman, Roy P. "The High Cost of Holding Land". Urban Land (October 1968), pp. 10-12.

- problems of land acquisition and holding costs
- suggests four solutions:
    - developers can associate with strong financial institution
    - put land to profitable intermediate use
    - get Federal low-interest, long-term land assembly loan
    - only buy land when ready to develop.

B-0-0 Parrish, Harrold. Compulsory Acquisition of Land (London: Stevens and Sons, 1962).

A-1-1 Singleton, C.B. Jr., and Scofield, W.H. "Land Syndication and the Rural-Urban Fringe," Appraisal Journal Vol. 30 (1962), pp. 492-500.

- land syndicators are people who team to assemble land
- techniques to minimize actual investment
    - options, instalment, purchase, etc.

A-0-0 Slater, David W. "The Political Economy of Urban Changes in Canada" Queen's Quarterly. Vol. 67 (1960), pp. 586-604.

- role of public and private sectors in land-use change
- imperfections in market mechanism
- requires government intervention
- land assembly and subdivision discussed.

B-0-2 Urban Centres in the Atlantic Provinces - Background Paper No. 7 (Ottawa: Atlantic Development Board, 1970).

- land should be assembled
- sold directly to purchaser, without developer between.

D. NATURE OF URBAN LAND MARKETS

B-1-2 Alonso, William. Location and Land Use. (Boston: Harvard University Press, 1964).

- rent-bid model of agricultural land
- farmland value declines with distance from market
- generalizes to land value highest at centre of economic activities

A-0-0 Alonso, William, "A Theory of the Urban Land Market." Papers and Proceedings of the Regional Science Association. Vol. 6 (1960). pp. 149-157.

A-0-0 Blumenfeld, Hans. "The Urban Pattern", Annals of the American Academy of Arts and Sciences, Vol. 352 (March 1964), pp. 74-83.

B-0-1 Bourne, Larry S. Dimensions of Metropolitan Land Use: Cross-Sectional Structure and Stability. Centre for Urban and Community Studies, Research Paper No. 31 (Toronto: University of Toronto, 1970).

B-0-0 L.S. Bourne and A.M. Baker. Urban Development in Ontario and Quebec: Outline and Overview, Component Study 3. (Toronto, Centre for Urban and Community Studies, University of Toronto, September 1968).

B-0-0 L.S. Bourne and J.B. Davies, Behaviour of the Ontario-Quebec Urban System: City-Size Regularities, Component Study 3, (Toronto: Centre for Urban and Community Studies, University of Toronto, September 1968).

A-0-0 Boyce, Ronald. "Changing Patterns of Land Use Consumption", Professional Geographer. Vol. 15, No. 2 (March 1963).

B-0-0 T. Bunting and A.M. Baker, Structural Characteristics of the Ontario Quebec Urban System, Component Study 3, (Toronto: Centre for Urban and Community Studies, University of Toronto, September 1968).

B-0-1 Doucet, M.J. Trends in Metropolitan Land Use and Land Consumption: Metropolitan Toronto 1963-68. (Toronto: University of Toronto, Centre for Urban and Community Studies, July 1970) Research Paper No. 35.

B-0-0 S. Golant and L.S. Bourne, Growth Characteristics of the Ontario-Quebec Urban System, Component Study 3, (Toronto: Centre for Urban and Community Studies, University of Toronto, September 1968).

A-0-2 Harvey, R.O. and Clark, W.A.V. "The Nature and Economics of Urban Sprawl" Land Economics (February 1965).

B-0-0 Hertzfield, H.R. Physical Characteristics of Cities and Regional Growth. (Washington: Institute for Urban and Regional Studies, Washington University, June 1966).

B-0-0 G. Hodge, Patterns and Parameters of Industrial Location in the Toronto Urban Field, (Toronto: Centre for Urban and Community Studies, University of Toronto, April 1970).

A-1-2 Loewenstein, Louis K. "The Location of Urban Land Uses" Land Economics Vol. 39, No. 4 (November 1963), pp. 407-420.

- model of urban land use
- measures concentration for 8 industry types in terms of distance from CBD.

A-0-2 McBride, George A. and Clawson, Marion. "Negotiation and Land Conversion", Journal of the American Institute of Planners, Vol. 36 (1970), pp. 22-29.

- land conversion viewed as a process of negotiation
- lists agents involved and process whereby land is brought to the verge of development
- developer the initiator and public officials become accommodators, thereby losing much of the potential control over land development.

B-0-0 Spelt, J., The Urban Development in South-Central Ontario (Assen, Netherlands: Van Gorcum, 1955).

B-0-0 Wingo, Lowdon, Jr. Cities and Space, The Future Use of Urban Land Paperback edition. (Baltimore: John Hopkins Press, 1966).

A-0-0 Winsborough, H. "City Growth and City Structure", Journal of Regional Science. Vol. 4, No. 2 (1962).

E. LAND SUPPLY FOR URBAN USE

B-0-0 Arnott, Gordon R. and Associates. Site Planning for M/F Housing. Land Use and Land Use Planning Study. (Regina, Sask.: (1968)).

B-1-0 Best, Robin M. Land For New Towns. Town and Country Planning Association (London 1964).

- study of "new towns" in Great Britain
- average overall density 55 acres per 1000; residential density 26.7 acres per 1000.
- no low density new towns
- "new town" space standards similar to old towns, except education better in new towns.

B-0-2 Bogue, D.J. Metropolitan Growth and the Conversion of Land to Non-Agricultural Uses. Scripps Foundation Studies in Population Distribution. No. 11. (Oxford, Ohio: Scripps Foundation, 1956).

A-0-0 Bourne, Larry S. "Urban Blight and Redevelopment," The Canadian Banker, Vol. 76 (1969), pp. 15-18.

- brief discussion of redevelopment and blight, which defines both terms and reviews redevelopment in Toronto (with statistics on floor space and land area).
- emphasizes private redevelopment, and concludes with an outline of trends and problems.

B-0-0 Bourne, Larry S. Private Redevelopment of the Central City. Research Paper No. 112. (Chicago: Department of Geography, University of Chicago, 1967), 199 pp.

Probably the only thorough study available on the nature and spatial patterning of private redevelopment. Amount of new construction investment, and allocation by type, are taken as given. The author begins by examining theories of urban morphology and growth, and explains rural-urban land conversion and central city redevelopment as complementary processes. His empirical investigation of Toronto gives a historical outline of development, then utilizes detailed assessment records for 1952 and 1962 in examining structural changes. The study culminates in a predictive 'area redevelopment model' using multiple regression techniques.

B-0-0 Bourne, L.S. Trends in Urban Redevelopment. Component Study 3. (Toronto: Centre for Urban and Community Studies, University of Toronto, August 1968).

A-1-1 Bryant, R.W.G. "The Cities", Canadian Dimension, Vol. 6, No. 1 (April-May 1969), pp. 12-15.

- critique of Canadian and U.S. land use policies
- Montreal, Laval, Oakville, Halifax examples.

B-0-0 Clawson, Marion, Held, R. Burnett, Stoddard, Charles H. Land for the Future, Resources for the Future Inc. (Baltimore: John Hopkins Press, 1960).

A-0-2 Crerar, A.D. "The Loss of Farmland in the Growth of the Metropolitan Regions of Canada, Resources for Tomorrow, Supplementary Volume, (Ottawa: Queen's Printer 1962), pp. 181-195.

B-1-2 Department of Housing and Urban Development. Urban Land Policy - Selected Aspects of European Experience (Washington, D.C.: D.H.U.D., 1969).

- land scarcity and solutions discussed.

B-1-2 Economic Council of Canada. The Canadian Economy from 1960's to the 1970's. Fourth Annual Review, (Ottawa: Economic Council of Canada, September 1967).

- quantifies demand for land consumption in seventies.

B-0-0 Goode, Frank. Economic Supply of Land for Urban Expansion. Unpublished Ph.D. thesis, University of Minnesota, 1969.

- focuses on the predevelopment landowner and his decision to sell for urban development.
- analyzes factors causing resistance to sale of land, by-passing some tracts, and development of less eligible tracts.

A-0-2 Hind-Smith, J. "The Impact of Urban Growth on Agricultural Land: A Pilot Study", Resources for Tomorrow. Supplementary Volume (Ottawa: 1962).

B-0-0 Hoyt, Homer. Urban Land Use Requirements 1968-2000. The Land Area Required for Future Growth of the Urban Population of the United States. (Washington, D.C.: Homer Hoyt Associates, 1968).

B-1-2 Jacobs, Peter. Site Planning Process - Activity Allocation. (Halifax: Nova Scotia Technical College, 1970).

- study of Land Use potential of Halifax periphery
- concentration on ecology - water and sewers.

B-0-2 Mandelker, Daniel R. Green Belts and Urban Growth. (Madison: University of Wisconsin Press, 1962).

A-0-0 Manvel, Allen D. "Land Use in 106 Large Cities" in Three Land Research Studies, Research Report No. 12, The National Commission on Urban Problems (Washington, D.C.: U.S. Government Printing Office, 1968), pp. 19-59.

A-1-2 March, Lionel "Homes Beyond the Fringe" Royal Institute of British Architects Journal, Vol. 74, No. 8. (August 1967), pp. 334-337.

- utopian spatial model of urban land use.

B-0-0 Schmid, Allan. Converting Land From Rural to Urban Uses. (Baltimore: The Johns Hopkins Press (for Resources for the Future, Inc.) 1968). 103 pp.

- financially-oriented discussion of land conversion process
- conversion efficiency and rent theory discussed.

A-1-2 Symington, D.F. "Land Use in Canada: The Canada Land Inventory" Canadian Geographer. Vol. 76, No. 2 (February 1968), pp. 44-55.

- technical discussion of Canadian Land Inventory.

A-0-0 Wehrwein, G.S. "The Rural Urban Fringe", Economic Geography, Vol. 18 (July 1942).

B-0-2 Wood, W.D. and Thoman, R.S. Areas of Economic Stress in Canada. (Kingston: Industrial Relations Centre, Queen's University, 1965).

F. LAND PRICES AND VALUE

B-0-0 Bartholomew, Harland. Land Uses in American Cities. (Cambridge, Mass.: Harvard University Press, 1955).

- transportation uses occupy 1/3 of all developed land in American cities.

B-0-0 Brigham, Eugene F. A Model of Residential Land Values. Memorandum R M -4043-RC. (Santa Monica, California: The RAND Corporation, 1964), 91 pp.

A-0-2 Czamanski, Stanislaw. "Effects of Public Investments on Urban Land Values," Journal of the American Institute of Planners. Vol. 32 (July 1966), pp. 204-17.

- statistical analysis finds factor determining urban land value is accessibility to control urban functions.
- age of existing structures and zoning are secondary factors.
- indirect public actions influence urban land value.

A-0-0 Gaffney, M.M. "Urban Expansion - Will It Ever Stop?" The Yearbook of Agriculture, 1958. (Washington: U.S. Department of Agriculture, 1958), pp. 503-522.

- wide ranging review of city growth, its costs and benefits.
- outlines why urban land values are high and how cities are expanding
- condemns 'scatteration'

B-0-1 Hamilton, Stanley. Price Movements in Urban Properties Facing Development: A Study of West Vancouver. Ph.D. Dissertation University of British Columbia (April 1970).

A-1-2 Illing, Wolfgang M. "The Rising Cost of Housing and Problems of Financing" in Wheeler, M. The Right to Housing. (Montreal: Harvest House, 1969).

- descriptive analysis of six components of rising land costs.

A-0-0 Maisel, Sherman J. "Price Movements of Building Sites in the United States - A Comparison Among Metropolitan Areas", Regional Science Association Papers. Vol. 12 (1964) (European Congress, Lund, 1963).

A-0-0 Mandelker, Daniel R. "Controlling Land Values in Areas of Rapid Urban Expansion", UCLA Law Review. Vol. 12, No. 3 (March 1965), pp. 734-761.

- compares land use planning and land pricing problems in England and America

B-0-0 Milgram, Grace. U.S. Land Prices -- Directions and Dynamics. (Washington, D.C.: U.S. Government Printing Office, 1968), 77 pp.

A-0-0 Mills, Edwin S. "The Value of Land", in H.S. Perloff (ed) The Quality of Urban Environment (Baltimore: John Hopkins University Press for Resources for the Future, Inc. in press).

B-0-0 Mishan, E.J. Growth: The Price We Pay. (London: Staples Press, 1969).

- discipline can be a structure to prevent problem solution.

B-0-0 Muth, Richard F. Cities and Housing. (Chicago: University of Chicago Press, 1969), 355 p.

- series of models aimed at explaining the operation of the price system in the market for urban housing and residential land.
- examines the allocation of housing in urban space, the consumption of housing per household, and housing output per unit of residential land for different areas of the city.

B-0-0 Olcott, G.H. Blue Book of Land Values. (Chicago: G.H. Olcott, Co., annual).

- U.S. Land Values

A-1-1 Pearson, David. "Challenge of Rising Land Costs Is Reviewed at Council Meeting," Urban Land. Vol. 27, No. 6 (June 1968), pp. 3-8.

- high land costs not a problem, problem is high incomes.

B-0-0 Seedman, D.E. An Operational Model of Residential Land Market. (Penn-Jersey Transportation Study, 1964).

B-1-2 Stone, P.A. Urban Development in Britain: Standards, Costs and Resources, 1964-2004. Vol. 1 Population Trends and Housing. (London: Cambridge University Press, 1970).

- analysis of British housing, and development costs data with some land and housing components.

B-0-2 Stone, P.A. Housing, Town Development, Land and Costs. (London: The Estates Gazette Ltd., 1963).

A-0-0 Weiss, Shirley F., Donnelly, Thomas G., and Kaiser, Edward J. "Land Value and Land Development Influence Factors: An Analytical Approach for Examining Policy Alternatives," Land Economics. Vol. 42 (1966), pp. 230-233.

- multiple regression model to predict land-use changes in Greensboro Urban Area.
- nineteen-sixty data on up to 14 independent variables compared to 1963 assessments of land use and value.
- variables predict land value better than land use.

A-0-0 Wendt, P.F. "Theory of Urban Land Values" Land Economics Vol 33. (1957) pp. 228-240.

A-0-1 Willhelm, Sidney and Sjoberg, Gideon. "Economics vs. Protective Values in Urban Land Use Change," American Journal of Economics and Sociology. Vol. 19. (Jan. 1960) pp. 151-160.

B-0-0 Wingo, Lowdon. Transportation and Urban Land. (Washington, D.C.: Resources for the Future Inc., 1961).

G. LAND OWNERSHIP

A-0-0 Alessi, L.de. "Property Rights for Government Investment", American Economic Review, (Palo Alto, California: Stanford University Press, March 1969).

A-0-2 Berkman, H.G. "Decentralization and Blighted Vacant Land," Land Economics (August 1956).

A-0-0 Bryant, R.W.G. "Housing" Canadian Dimension. Vol. 6, No. 5, (October-November 1969), pp. 19-22.

B-0-0 Kenney, Kenneth B. Predevelopment Land Ownership Factors and Their Influence on Residential Development, Centre for Urban and Regional Studies, Institute for Research in Social Science, University of North Carolina, September 1965.

B-0-0 Lessinger, Jack. The Determination of Land Use in Rural-Urban Transition Areas: A Case Study in Northern Santa Clara Valley, California. Ph.D. Thesis. (University of California, 1957).

B-1-0 L'Habitation Publique et Cooperative - 1er seminaire national - dans Revue du Centre Canadien International de Recherches et d'Information sur l'Economic Publique et Cooperative. Vol. 1, No. 1 (Juillet-Decembre, 1968).

B-0-0 Smith, John E. Toward a Theory of Land-owner Behaviour on the Urban Periphery, Masters Thesis. Department of City and Regional Planning, (Chapel Hill: University of North Carolina, 1967) pp. 102-116.

H. FACTORS AFFECTING LAND USE

B-0-0 Berry, Brian J.L. and Horton, Frank E. Geographic Perspectives on Urban Systems. (Englewood Cliffs, N.J.: Prentice Hall, Inc., 1970).

B-0-1 Bourne, L.S. and Doucet, M.J. Dimensions of Metropolitan Physical Growth: Land Use Change Metropolitan Toronto. Research Paper No. 38 (Toronto: Centre for Urban and Community Studies, University of Toronto, 1970).

B-0-0 Bourne, Larry S. Forecasting Land Occupancy Changes Through Markovian Probability Matrices: A Central City Example. Research Report No. 14 (Toronto: Centre for Urban and Community Studies, University of Toronto, 1969), 22 pp.

A-0-0 Bridger, M. Keith and Greer-Woolten, Bryn. "Landscape Components and Residential Urban Growth in Western Montreal Island", Révue de Géographic de Montréal. Vol. 19, No. 1 and 2 (1965), pp. 75-90.

- an analysis of the attraction of various terrain characteristics for housing.

B-0-2 Canadian Council on Rural Development. Rural Canada 1970: Prospects and Problems (Ottawa: CCRD, 1970).

- critical of DREE influence on housing in rural areas.

B-0-0 Chamberlain, Simon B. Suburbanization and Household Location Decisions. Unpublished B.A. Thesis, Department of Geography, University of Toronto, 1970. 54 pp.

- investigates explanations for suburbanization
- analyses the search for a new home utilizing the Brown-Moore model (built about concepts of place utility, search space and awareness space).

A-0-2 Chapin, F. Stuart Jr., and Hightower, Henry C. "Household Activity Patterns and Land Use," Journal of the American Institute of Planners. Vol. 31 (1965), pp. 222-231.

- household leisure-time activities analysed using a questionnaire and the Chapin 'game'.

B-1-2 Chapin, F. Stuart Jr. and Weiss, Shirley F. Factors Influencing Land Development. Institute for Research in Social Sciences (Chapel Hill: University of North Carolina, 1962).

- late 50's computer model of land use, mainly GREENSBORO study.
- discusses analogy and behavioral modelling.

B-0-0 Chapin, F. Stuart and Weiss, Shirley F. Some Input Refinements for a Residential Model. (Chapel Hill: Center for Urban and Regional Studies, University of North Carolina, 1965), 68 pp.

- introduces refinements to above model to bring simulated residential growth closer to real world process.

A-0-2 Chapin, F. Stuart Jr. "A Model for Simulating Residential Development". Journal of the American Institute of Planners. Vol. 31 (1965). pp. 120-125.

- individuals decision to residential location conditioned by:
  (1) choice and intensity of residential development as prescribed in general plan or by zoning;
  (2) what the producers offer (shelter package, price and accessibility of site);
  (3) what household can afford;
  (4) household activity patterns and taste norms.

A-0-2 Chapin, F. Stuart, Jr. "Activity Systems and Urban Structure: A Working Scheme", Journal of the American Institute of Planners. Vol. 34 (1968), pp. 11-18.

- focus on household as users of city space
- activity systems of urban residents are seen both to share and to be shaped by the spatial organization of the metropolitan area.

B-0-2 Cockfield, Richard W. A Design Method for the Preparation of a Preliminary Urban Land Use/Transportation Plan. (University of Waterloo, May 1970).

- M.A. Thesis
- transport - land use model with computer programs.

B-0-0 Donnelly, Thomas, Chapin, F.S. Jr. and Weiss, S.F. A Probabilistic Model for Residential Growth. (Chapel Hill: Center for Urban and Regional Studies, University of North Carolina, 1964), 65 pp.

- model to find residential development pattern likely to emerge from given forecast of population growth and government action.

A-0-2 Gertler, L. "Studies on Urban Shadow Phenomenon in Three Ontario Communities", Conservation Council of Ontario. Resources for Tomorrow Conference 1961.

A-1-2 Hansen, Walter G. "How Accessibility Shapes Land Use", Journal of the American Institute of Planners. Vol. 25, No. 2 (May 1959), pp. 73-76.

- Washington
- accessibility as key factor in land use

A-0-0 Forward, C.N. "A Comparison of Waterfront Land Use in Four Canadian Ports: St. John's, Saint John, Halifax and Victoria," Economic Geography. Vol. 45, No. 2 (April 1969), pp. 155-167.

A-1-2 Hamburg, John R. and Creighton, Roger L. "Predicting Chicago Land Use Pattern", Journal of the American Institute of Planners, Vol. 25, No. 2 (May 1959), pp. 67-72.

- CATS - Chicago Area Transport Study

B-0-0 Kerr, Donald and Spelt, Jacob. The Changing Face of Toronto. Department of Mines and Technical Surveys, Geographical Branch, Memoir No. 11 (Ottawa: Queen's Printer, 1965).

- describes the historical growth of Toronto and the effect of the various factors.

A-0-0 Latham, R. and Yeates, M. "Population Density Growth in Metropolitan Toronto," Geographical Analysis. Vol. 2, No. 2 (April 1970).

B-0-1 Maher, C.A. and Bourne L.S. Land Use Structure and City Size: An Ontario Example. Research Paper No. 10. (Toronto: University of Toronto, Centre for Urban and Community Studies, 1969).

B-1-2 Michelson, William. Man and His Environment, a Sociological Approach. (Don Mills: Addison-Wesley, 1970).

- sociology of physical structures
- proposes class mix in residential land use.

A-0-0 McDaniel, Robert. "Some Spatial Relations of the London, Ontario Economy." Land-Use Management Conference. (London: December 7, 1966).

B-0-1 Montgomery, D.A. et al. Urban Land Use in Ontario - Areas and Intensity. (Toronto: Community Planning Branch, Department of Municipal Affairs).

B-0-2 Murdie, Robert A. Factorial Ecology of Metropolitan Toronto, 1951-1961: An Essay on the Social Geography of the City. (Chicago: University of Chicago, 1969).

- Three dimensions account for most inter census tract changes in period
  - economic status
  - family status
  - ethnic status
- finds that normal (concentric, sector, or multi nuclei) models unsatisfactory.

A-0-0 Muth, R.F. "Economic Change and Rural-Urban Land Use Conversion", Econometrica Vol. 29 (1961), pp. 1-23.

A-0-0 Rapkin, Chester. "Economic Patterns of Land Use" Appraisal Journal Vol. 38 (April 1970), pp. 227-239.

A-1-2 Row, Arthur and Jarkat, Ernest. "The Economic Forces Shaping Land Use Patterns", Journal of the American Institute of Planners. Vol. 25, No. 2 (May 1959), pp. 77-81.

- urban activities depend on proximity to other activities.

A-0-0 Sacks, Seymour. "Spatial and Locational Aspects of Local Government Expenditures", in Schaller, Howard G. Public Expenditure Decisions in the Urban Community (Baltimore: 1963), pp. 180-98.

B-0-2 Simmons, James and Simmons, Robert. Urban Canada (Toronto: Copp-Clark, 1969).

- compares and contrasts urban areas in terms of size, age, setting and ethnic background
- historical development of urban areas
- economic development and specialization
- patterns of land use
- forces in urban development.

B-0-0 Simmons, James W. Toronto's Changing Retail Complex (Chicago: University of Chicago, Department of Geography, Research Series No. 104, 1965).

A-0-0 Voorhees, Alan M. "Urban Growth Characteristics", Urban Land Vol. 20, No. 11 (1961), pp. 3-6.

- use of multiple correlation analysis to measure importance people place on various factors in making locational decisions
- Hartford study, using 9 variables - availability of land and sewer facilities most important.

B-0-0 Webber, Melvin M., Dykeman, J.W., Foley, D.L., Guttenberg, A.Z., Wheaton, W.L.C., and Wurster, C.B. Explorations into Urban Structure (Philadelphia: 1964).

A-0-0 Weiss, Shirley F. and Kaiser, Edward J. "A Quantitative Evaluation of Major Factors Influencing Urban Land Development in a Regional Cluster," Traffic Quarterly. Vol. 22 (1968), pp. 109-115.

- multiple regression analysis to explain urban development patterns for 5 North Carolina cities.

A-0-0 Wingo, Lowdon, Jr. "An Economic Model of the Utilization of Urban Land for Residential Purposes," P.P.R.S.A. Vol. 7 (1961), pp. 191-205.

- a static intrametropolitan model of the urban household sector in which household decisions are assumed mutually independent and parameters fixed.

A-O-1 Yeates, Maurice H. "Some Factors Affecting the Spatial Distribution of Chicago Land Values, 1910-1960". Economic Geography Vol. 41 (January 1965), pp. 57-70.

- CBD declining as creator of land values, as is rapid transit.
- new foci in suburbs and expressways more important.

J. LAND DATA INFORMATION

A-0-0 Balabon, Maurice B. "Aspects of Urban Land Use Inventory in Metropolitan New York," Canadian Geographer. Vol. 8, No. 3 (1964), pp. 117-124.

A-0-2 Bourne, L.S. "Measuring Land Use and Structural Change: One Element of an Urban Information System." Plan Vol. 10, No. 2 (1969), pp. 7-15.

- assessment data - based system with co-ordination by ledger number
- based on Toronto spatial study
- Toronto and Metro Toronto included in total.

B-0-0 Canada, Department of Mines and Technical Surveys, Geographical Branch. The Atlas of Canada, plates 100-103. "Urban Growth and Land Use" for Quebec, Montreal, Ottawa, Toronto, Winnipeg, Edmonton, Vancouver, Victoria.

B-0-0 Canada, Dominion Bureau of Statistics. Standard Industrial Classification Manual. (Ottawa: Queen's Printer, March 1960).

B-1-2 Clawson, Marion and Stewart, Charles L. Land Use Information. Resources for the Future, Inc. (Baltimore, John Hopkins Press, 1965).

- discussion of classification and coding of land use information
- best information source in the field.

B-0-2 D.R.E.E. "The Canadian Land Inventory" Objectives, Scope and Organization. Report No. 1, 1965. Second Edition, 1970.

A-0-0 Guttenberg, Albert. "A Multiple Land Use Classification System", Journal of the American Institute of Planners, Vol. 25 (August, 1959), pp. 143-150.

B-0-0 Guttenberg, Albert. New Directions in Land Use Classification. (Chicago: American Society of Planning Officials, 1965).

B-0-0 Hall, George R. Land Use Information. (Santa Monica, California: RAND Corporation, November, 1966).

B-1-2 Hills, G.A. The Ecological Basis for Land-Use Planning. Research Report No. 46 (Toronto: Ontario Department of Lands and Forests, 1961).

- base of "Hills" system; a seven point "use-capability" rating of agricultural potential of Ontario land.

A-1-2 Hodge, Gerald and McCabe, Robert. "Land Use Classification and Coding in Canada: An Appraisal" Plan Special Issue (June 1968), pp. 7-25.

- proposes two systems:
  - outer (rural) address based - national statistics
  - inner (urban) block based - municipal and provincial
    - need to identify parcels
- for land use data, need three classifications, each one criteria: activity, function, building type

A-0-0 Ion, R.J. "The Geographic Basis of the D.B.S. Geocoding System for Urban Areas" Analytical and Technical Memorandum No. 3 Census Division, Dominion Bureau of Statistics.

A-0-0 McCabe, R.W. "Report on the Activities of the T.P.I.C. Land Use Committee." Paper delivered at the 1967 Staff Conference, Community Planning Branch, Ontario Department of Municipal Affairs.

B-1-2 Ontario, Province of. Economic Atlas of Ontario. (Toronto: University of Toronto Press, 1969).

- over 400 plates, including land use, based on 1961 census.

A-0-1 Roberts, W.F. "A Computer-Based Land Titles System," Ontario Institute of Land Surveyors Annual Report (1970), pp. 138-144.

- introduces total "land titles" system conversion with space for Land Use data.

B-1-2 Rotoff, Basil M. Planning and Land Use Data Bank: A Pilot Project. Dept. of City Planning (U. of Manitoba, July 1970).

- pilot data bank - Gimli, Manitoba
- inventory of Manitoba data group (Departments, Agencies, what data and why)
- model total information system
- LINK concept
- problems in implementing data bank.

A-1-2 Simmons, James W. "Urban Geography in Canada," Canadian Geographer Vol. 11, No. 4 (1967) pp. 341-356.

- survey of state of art
- notes lack of work
- direction of research - multi - variate analysis.

A-0-1 Smith, Ralph A. The Development of the Ontario Co-ordinate System and its Relationship to Urban Data Banks and Data Management Programs. Paper presented to Government Data Processing User's Group, Toronto, September 14, 1967.

B-O-O Tomlinson, R.F. An Introduction to the Geo-Information System of the Canadian Land Inventory (Ottawa: 1967).

B-O-O U.S.A. Urban Renewal Administration and Bureau of Public Roads. Standard Land Use Coding Manual (Washington, D.C.: January 1965).

- standard U.S. coding manual
- discussed in Clawson, M. Land Use Information.

J. SPACE

A-O-2 Haar, Charles M. "The Social Control of Urban Space," in Lowden Wingo Jr. (ed) Cities in Space: The Future Use of Urban Land (Baltimore: John Hopkins Press, 1963).

A-O-1 Hoffer, Abraham. "The Importance of Privacy" Canadian Planning Review. (Summer, 1969) pp. 13-16.

- proposes theoretical construct based on degrees of privacy in social activity patterns.

B-1-1 Hall, Edward T. The Hidden Dimension (New York: Doubleday, 1966)

- Proxemics - use of space as a specialized elaboration of culture
- formal and informal space
  - cultural characteristics and cross-cultural comparisons

A-O-2 Krasnewieki, J. and Strong, Ann L. "Compensable Regulations for Open Space." Journal of the American Institute of Planners (May 1963).

B-1-2 Social Planning Council of Metropolitan Toronto. A Preliminary Study of the Social Implications of High Density Living Conditions (Toronto: April 1966).

- survey of housing, particularly apartments, and tenant characteristics on Toronto in the mid-60's.

B-1-2 Sommer, Robert. Personal Space. The Behavioral Basis of Design. Englewood Cliffs, N.J.: Prentice-Hall, 1969.

- investigates personal space as it relates to (1) the zone around each person which regulates the spacing of individuals (2) the process by which people mark out and personalize the spaces they inhabit.

B-O-O Whyte, William H. Securing Open Space for Urban America. (Washington, D.C.: Urban Land Institute, 1959).

K. GENERAL

B-0-1 Baine, Richard P. and McMurray, A. Lynn. Toronto: An Urban Study. (Toronto: Clarke Irwin and Co., 1970).

B-1-2 Barlowe, Raleigh. Land Resource Economics. (Englewood Cliffs, New Jersey: Prentice-Hall, 1958).

- compendium on land and land economics

B-1-0 Bauer, Raymond (ed). Social Indicators. (Cambridge: M.I.T. Press, 1966).

- essays for NASA discuss need for social data to indicate acceptance of major program activity in nation.

B-0-0 Canadian Building Digest - D.B.R., N.R.C. publication

B-0-0 Chorley, Richard T. and Haggett, Peter (eds). Models in Geography. (London: Methuen, 1967).

- textbook on models and modelling.

B-0-0 Clawson, Marion. Man and Land in the United States. (Lincoln: University of Nebraska Press, 1964).

B-0-0 Ehrlick, Paul R. and Ehrlick, Anne M. Population, Resources, Environment - Issues in Human Ecology (San Francisco: W.H. Freeman & Co., 1970).

- population ecology

B-0-2 Feldman, Lionel D. and Goldrick, Michael D. Politics and Government of Urban Canada. (Toronto: Methuen Publications, 1969).

B-0-0 Lithwick, N.H. and Paquet, G. Urban Studies: A Canadian Perspective (Toronto: Methuen Publications, 1968).

B-0-1 Lithwick, N.H. Urban Canada Problems and Prospects. Report prepared for Hon. R.K. Andras, Minister Responsible for Housing. (Ottawa: CMHC, 1970), 236 pp.

A-0-0 Kasperson, Roger E. "Toward a Geography of Urban Politics", Economic Geography. Vol. 41 (April 1965), pp. 95-107.

A-1-1 Krause, Elliot A. "Function of a Bureaucratic Ideology: Citizen Participation," Social Problems. Vol. 16, No. 2 (Fall 1968). pp. 129-143.

- bureaucratic use of "participation" ideology.

B-0-0 Maxwell, J.W. A Functional Classification of Canadian Cities. M.A. Thesis (University of British Columbia, 1964).

- unpublished
- available - E. M. and R. library

B-0-2 Meier, Richard L. "A Communications Theory of Urban Growth" Joint Centre for Urban Studies (Cambridge: M.I.T. Press, 1962)

- City as an open system must, to remain viable, conserve negative entrophy (information).
- Entrophy measured as a stock of knowledge and various addresses and content.

A-1-2 Michelson, William. "Urban Sociology as an Aid to Urban Physical Development: Some Research Strategies," Journal of the American Institute of Planners. Vol. 34 (1968), pp. 105-108.

- key environmental factors must be isolated, and reactions to these assessed for future projections.

A-0-0 N.B.C. News - monthly of D.B.R., N.R.C. Jan.'57 - present.

B-0-2 Ontario, Department of Municipal Affairs. 1965 Annual Report of Municipal Statistics. (Toronto: 1966).

- Ontario assessment and grants in lieu statistics, by municipality.

B-1-2 Ontario, Government of. A Better Place to Live. (Toronto: Department of Municipal Affairs, Three Reports.
1st Interim - April 1960; 2nd Interim - May 1961;
Final Report - June 1962).

- study of minimum standards, including a model occupancy and maintenance by-law.

B-0-2 Perloff, H.S. and Wingo, L. Jr.(eds) Issues in Urban Economics. (Baltimore: The John Hopkins Press, 1968).

A-0-1 Reich, Charles A. "The Greening of America", The New Yorker. Vol. 27 (September 1970), pp. 42-108.

- failure of North Americans to internalize goals.

B-0-2 Service d'Urbanisme - City of Montreal Urbanization. Bulletin Technique No. 5. (November 1966).

B-O-2 Stone, Leroy O. Urban Development in Canada. 1961 Census Monograph, (Ottawa: Dominion Bureau of Statistics, Queen's Printer, 1967).

B-O-2 Tunnard, Christopher and Pushkarev, Boris. Man-Made America - Chaos or Control? (New Haven: Yale University Press, 1963).

L. BIBLIOGRAPHIES

B-0-2 Berry, J.L.B. and Pred, A. Central Place Studies: A Bibliography of Theory and Applications. (Philadelphia: Regional Science Research Institute, 1961).

- bibliography of Central Place theorists

B-0-3 Bled, C.E. International Catalogue Comparative Housing Programmes. A Reference guide to housing programmes and policies, by categories in selected countries (Nov. 1970).

B-0-2 Canadian Council on Urban and Regional Research. Urban and Regional References. (1945-69 with supplements).

B-0-1 Chamberlain, Simon B. and Crowley, David F. Decision-Making and Change in Urban Residential Space: Selected and Annotated References. Report No. 2 (Toronto: University of Toronto, Centre for Urban and Community Studies, August 1970).

B-0-2 Council of Planning Librarians, Exchange Bibliographies.

- series of reference bibliographies.

A-1-1 Crecine, John P. "Computer Simulation in Urban Research" Public Administration Review. Vol. 28 (1968), pp. 66-77.

- surveys major urban models.

B-0-3 Directory: Housing and Urban Development Association of Canada. (Dec. 1970)

- lists names and addresses of presidents, secretaries and national executive.

A-1-3 Doern, G.B. Policy Making in Canada. Carleton University - Political Science 401 Reading List.

B-1-2 DREE, ARDA Catalogue - 1968. (Ottawa: Queen's Printer, March 1968).

- detail of CLI projects

A-1-1 Simmons, James W. "Descriptive Models of Urban Land Use". Canadian Geographer. Vol. 9, No. 3 (1965), pp. 170-174.

A-0-2 Wilson, A.G. "Models in Urban Planning: A Synoptic Review of Recent Literature" Urban Studies Vol. 5, No. 3 (November 1968), pp. 249-276.

2. MODELS - William A. Hamilton

TABLE OF CONTENTS

SOCIAL, ECONOMIC, AND STRUCTURAL URBAN MODELS RELATED TO LAND

Selected and Annotated References

1.0 INTRODUCTION

The purposes of this bibliography are:

1) to present references which review and assess past modeling attempts and which discuss modeling theory;
2) to present references to various models which have been developed or are now being developed and which illustrate the wide scope of past model development.

The references have been culled from a number of different sources and are in no way comprehensive. It should be noted that many statistical analyses of facets of urban activity are, in fact, models but have not been described as such in many bibliographies.

The majority of references in this bibliography come from the United States. Although some modeling is being done in the United Kingdom and Europe, the most wide-ranging and substantial efforts have occurred in the United States and it is from this country that information is most readily accessible. There has been an increasing emphasis on modeling in Canada during the past ten years. (Canadian efforts are emphasized in this study by marking all Canadian references with an asterisk.) As an aid to further investigation of Canadian efforts in this field, a list of prominent Canadian modelers is appended. It should also be noted that some Canadian cities now have both research and operational models not listed here.

Selected references concerning the history, theory, and evaluation of past modeling are presented in the first section of the bibliography. However, it is appropriate to point out now that consideration

of models, particularly for operational purposes, should take into account major limitations which now exist and particularly in Canada (vs. the United States). These limitations include:

1) a paucity of qualified and experienced personnel;

2) an even greater lack of people experienced in modeling and skilled at computer programming; and

3) an almost crippling lack of data.

All three limitations lend strength to arguments for centralization of available, top-rate personnel and facilities in order to initiate well-founded efforts to use models for planning purposes. Data problems include a simple lack of data for individual cities, non-uniformity of data for all cities, and a critical lack of uniform data in time series. The ease and efficacy of modeling efforts would be greatly enhanced by improvement and expansion of the data available. It should also be noted that much of the past Canadian modeling effort has been severely compromised and/or is misleading -- since, in many cases, the people concerned have incompletely comprehended the mathematics underlying their model.

The classification of references used in this bibliography has been selected arbitrarily and is a modified version of that used by Lowry (Ira S. Lowry, "Seven Models of Urban Development: A Structural Comparison", in Urban Development Models, Special Report #97, Highway Research Board, Washington, 1968, (121-153)). Other possible typologies could be selected and these are noted below as they could be used to replace or refine the typology employed here, which is the fifth set of all listed below:

Model Typologies

1. a) Operational
   b) Research

2. a) Descriptive
   b) Predictive
   c) Planning

3. a) Residential
   b) Commercial
   c) Industrial
   d) Other

4. a) Behavioural
   b) Technical (Structural)

5. a) Land use
   b) Land use succession
   c) Location
   d) Migration and Travel
   e) Economic
   f) Infrastructure
   g) Information communication
   h) Other (unclassified)

2.0 REVIEWS AND MODELING THEORY

2.1 BERRY, J.L.B. and PRED, A., Central Place Studies: a Bibliography of Theory and Applications, Regional Science Research Institute: Philadelphia, 1961.

2.2 *BLUMENFELD, Hans. "Are Land Use Patterns Predictable?", J.A.I.P.; Special Issue, May 1959, 61-66.

2.3 CARROTHERS, G.A.P. "An Historical Review of the Gravity and Potential Concepts of Human Interaction," J.A.I.P., Vol. 22, No. 2, 1955, 94-102.

2.4 CHORLEY, Richard J. and HAGGETT, Peter, Editors. Models in Geography, Methuen & Co., Ltd.: London, 1967.

description of current modeling theory in the United Kingdom. Urban development is considered as part of two sections devoted to models of socio-economic systems and mixed systems. Extensive references are provided by each of the contributors.

2.5 CRECINE, John P. "Computer Simulation in Urban Research," Public Administration Review, Vol. 28, 1968.

Discussion of factors relevant to the use of computers in simulation. Also describes and assesses various American models of land use, land use succession, market, and so on.

2.6 DUNN, Edgar S. Jr., "A Flow Network Image of Urban Structures," Urb. Stud., 1970, 239-258.

2.7 GARRISON, William L. "Difficult Decisions in Land Use Model Construction," Highway Research Record, No. 102. Washington: Highway Research Board, 1965, 42-53.

Two problem areas in land use modeling are discussed in detail: (1) inclusion of notions about behaviour, and (2) decisions concerning structure. Garrison argues that in the development of any model, decisions must be made about the kind of behaviour that will be replicated, and that such decisions are both difficult and critical. In particular, decisions about the level of aggregation at which a topic will be treated are important, and planning behaviour should be included.

2.8 HARRIS, Britton, "Introduction: New Tools for Planning," J.A.I.P., Introduction to Special Issue, May 1965, 90-93.

2.9 HARRIS, Britton, "Linear Programming and the Projection of Land Uses," Penn Jersey Paper No. 20.

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* Asterisk denotes Canadian works.

2.10 HARRIS, Britton, ed. "Urban Development Models: New Tools for Planning," J.A.I.P., Special Issue, May 1965.

Proceedings of seminar at the University of Pennsylvania which illustrated the diversity, progress, and quality of the development of land use modeling in the 1960's.

2.11 HEMMENS, George C., ed. Urban Development Models. Washington, D.C.: Highway Research Board, Special Report 97, 1968. 266 pp.

This volume, the report of a 1967 conference on urban development models, provides a valuable state-of-the-art evaluation of land-use modeling, while looking forward to future developments. The whole conference is excellently summarized by Britton HARRIS (pp. 3-17), and there are major contributions by CHAPIN, LEVEN, LOWRY, and ALONSO, among others. Chapin's contribution considers activity systems as inputs for land-use models. The conference was concerned largely with model building techniques.

2.12 *HUTCHINSON, B.G. A Review of Selected Land Use Models. A Background paper prepared for a workshop on land use models at the University of Waterloo (Feb., 1971): Department of Civil Engineering, University of Waterloo, 1971.

2.13 *IRWIN, N.A. Review of Existing Land Use Forecasting Techniques, Highway Research Board Record 88, Highway Research Board, 1965.

2.14 ISARD, W. et al, Methods of Regional Analysis, John Wiley and Sons: New York, 1960.

2.15 *KATES, PEAT, MARWICK & CO. Ontario Planning Seminar 1970. Queen's Printer: Toronto, 1970.

Reports prepared by Kates, Peat, Marwick for a seminar of Ontario Senior Municipal Planners encompass a wide spectrum of model types -- although there is a noticeable lack of behavioral models. Numerous references are included for each paper. Extensive and simple discussion of how models are used in the planning process as well as several Canadian case studies (Oshawa, Winnipeg) are also included.

The data requirements of models and the need for and implications of geocoding systems are discussed in the last paper.

2.16 KOTLER, Philip. "Behavioural Models for Analyzing Buyers," J.M., 29 (1965), 37-45.

The author sketches the details of five behavioural models of consumer motivation: The Marshallian model, which stressed economic motivations; the Pavlovian model, on learning; the Freudian model, emphasizing social-psychological factors; and the Hobbesian model, of organizational factors.

2.17 LOWENSTEIN, Louis K., "On the Nature of Analytical Models," Urb. Stud., vol. 3, No. 2 (June 1966), 112-119.

2.18 MALM, Roger, OLSSON, Gunnar, and WÄRNERYD, Olaf. "Approaches to Simulations of Urban Growth," Geog. An., 48B (1966), 9-22.

This paper begins with a generalised discussion of problems in modeling spatial phenomena, and a review of urban models. It then outlines a model for simulating the growth of Gothenburg using probabilities derived from projected construction costs, taking into account proximity and 'slope preferences'. The paper closes with some suggestions about appropriate test techniques, emphasising quadrat analysis.

2.19 *SIMMONS, James W., "Descriptive Models of Urban Land Use," Can. Geog., IX, 3 (1965), 170-174.

2.20 "SIMMONS, James W. Flows in an Urban Area: A Synthesis. Toronto: University of Toronto (Centre for Urban and Community Studies, Research Report No. 6), 1968. 49 pp.

This monograph reviews and synthesises that segment of the literature pertaining to the title. It is hoped that an understanding of the nature of flows, mobility and interaction (within and between cities) will allow for greater comprehension of urban structure and change. Subject matter includes a discussion of matrix analysis as applied to the subject (e.g. Factor Analysis and Markov processes), and some mention of models which have been suggested thus far (e.g. the intervening opportunity model, and various behavioural models).

2.21 STEGER, Wilbur A., "The Pittsburgh Urban Renewal Simulation Model," J.A.I.P., special issue, May 1965, 144-149.

2.22 TRAFFIC RESEARCH CORPORATION, Review of Existing Land Use Forecasting Techniques. Boston Regional Planning Project, Mass Transportation Commission, July 1963.

2.23 VOORHEES, Alan M., ed. "Land Use and Traffic Models: A progress report," J.A.I.P., special issue, May 1951.

2.24 VOORHEES, Alan M. "The Nature and Uses of Models in City Planning," J.A.I.P., special issue, May 1959, 57-60.

Appraisal of transportation-based modeling and planning.

2.25 WILSON, A.G. "Models in Urban Planning: A Synoptic Review of Recent Literature," Urb. Stud., vol. 5, no. 3 (Nov., 1968), 249-276.

3.0 MODELS

3.1 LAND USE MODELS

3.1.1 BALTIMORE REGIONAL PLANNING COUNCIL

Baltimore Land Use Model (BALTLAND) distributes population employment throughout the planning region and computes related land utilization. The program operates in sequential iterative periods, allocating predetermined regional increments to small areas. Seven categories of land use, vacant land, and employment are accommodated.

Used in plan design. Different development policies were tested using constant region-wide population and employment forecasts. Three discreet plan alternatives resulted and were presented to policy makers. This procedure has been followed once.

3.1.2 BAY AREA TRANSPORTATION STUDY COMMISSION

PLUM (Projective Land Use Model): A BASS I, Lowry type model designed to locate residential population, population serving employment, housing units, and acreages associated with these activities; will operate incrementally and time recursively. SPILLOVER: A model to project county level two-digit SIC industires. BALFLO (Industry location model - P. J. Study). MHS (Modified Herbert Stevens Model): Two versions - equilibrium and growth. Residential activity location model.

Models are in developmental stage. Nothing can yet be said about use experience.

3.1.3 CHAPIN, F. Stuart Jr., "A Model for Simulating Residential Development", J.A.I.P., special issues, May 1968, 120-125.

3.1.4 CHAPIN, F. Stuart, Jr., and WEISS, Shirley F ., with DONNELLY, Thomas G. Factors Influencing Land Development. Chapel Hill: University of North Carolina (Center for Urban and Regional Studies, Institute for Research in Social Science), 1962. 101 pp.

A multiple regression analysis is used to explain land development in Greensboro, Winston-Salem, and Lexington (North Carolina). Subsequently a stochastic model for the prediction of fringe developments is presented. Appendices plot accessibility, study residential amenity as a land development factor, and analyse graphically the influence of several factors on land development. (NOTE: Later refinements of this basic model are found in 3.1.5 and 3.1.9).

3.1.5 CHAPIN, F. Stuart, and Weiss, Shirley F. Some Input Refinements for a Residential Model. Chapel Hill, N.C.: University of North Carolina (Center for Urban and Regional Studies, Institute for Research in Social Science), 1965. 68 pp.

This monograph is a sequel to 3.1.4 and 3.1.9. It concentrates on refinements introduced to bring the residential growth simulated in the initial versions of the model closer to the real world process. Two major changes in the data input are described, and results of the final runs of the refined model are presented in both statistical and map form.

3.1.6 CHICAGO AREA TRANSPORTATION STUDY

The CATS Density-Saturation Gradient Model for Land Use Forecasting. The purpose of this model was to forecast land use by major categories (i.e., residential, commercial, manufacturing, public open space, public buildings, transportation, communications, and public utilities and streets) for the Chicago Metropolitan Area by square mile traffic analysis zones.

The model was used to forecast land uses, from which trip generation activities could be derived and ultimately converted to future traffic behavior via the opportunity model.

3.1.7 DELAWARE VALLEY REGIONAL PLANNING COMMISSION

The Activities Allocation Model is a deterministic computer simulation of future urban development that is sensitive to changes in transportation policies. Variations in new freeway and transit networks, tolls, fares and parking charges, may be input to obtain variations in projections of future development. The model is recursive, proceeding in steps from the base year to a target year. It consists of seven major submodels, each determining the location of a given type of activity - residential, industrial, or commercial - or the amount of land that an activity uses. The submodels are generally nonlinear regressions calibrated individually in 1950 and 1960 data.

The model was used to project intraregional location and land use in 5-year increments in 1985 for three alternative transportation plans. To date it has only been used to provide projections for these three plans. These projections provide the inputs to the traffic simulation models.

3.1.8 DETROIT REGIONAL TRANSPORTATION AND LAND USE STUDY

Regional Allocation Models

(1) The Employment Distribution Model will allocate employment to approximately 100 sub-areas in the region. The zonal variables that are contemplated as being relevant are: Labor force accessibility, customer accessibility, accessibility to external trade, public service levels, land value, and industry mix. Of particular importance is the attempt to make employment location sensitive to the characteristics of the resident labor force through the accessibility measure.

(2) The Population Distribution Model will allocate the regional increment of population over a time period to the 1400 zones in the region and will produce by zone the characteristics of the population by life cycle group, income and possibly educational attainment and occupation. The generation of such characteristics for the region as a whole (through the regional forecast models) will be relevant here. Sub-models for generating income distribution and automobile availability within the zone will be developed. The final models for both the resident population and the zone will be developed. The final models for both the resident population and employment distribution will be merged into a singular allocation model which will be sensitive to policy variables implied in the plan alternatives. The models will be run in five year increments and, hence, incremental area policies can be introduced in a temporal sequence.

3.1.9 DONNELLY, Thomas G., CHAPIN, F. Stuart, Jr., and WEISS, Shirley F. A Probabilistic Model for Residential Growth. Chapel Hill: University of North Carolina (Center for Urban and Regional Studies, Institute for Research in Social Science), 1964. 65 pp.

The model presented here takes as given a forecast of population growth and local government action, and asks 'what pattern of residential development is likely to emerge?' Taking 1948 as a starting point, the model uses Monte Carlo techniques to 'forecast' 1960 residential distribution. The city is divided into cells, and these are either sterilized (if unsuitable for development) or assigned a level of attractiveness for development. Effects of 'priming decisions' and other changes are incorporated before households are allocated. Various improvements to the model are suggested. (NOTE: 3.1.5 gives details of some modifications.)

3.1.10 EASTERN MASSACHUSETTS REGIONAL PLANNING PROJECT

Empiric Land Use Distribution Model. Purpose: To forecast the consequences of selected policy actions. The consequences are output in terms of population and employment. The selected policy actions are improvements to highway and transit systems and reservations of land for any purposes and sewer and water service levels.

Projection: 10 production runs. Analysis (as design tool): 5 production runs. Model outputs are used as inputs for another independent plan evaluation technique.

3.1.11 GREER-WOOTTEN, Bryn. "Cross-Sectional Social Area Analysis: Montreal, 1951-1961." Unpublished report, McGill University, 1968. 18 pp.

This paper is a preliminary report of a social area analysis of Montreal, using 27 variables measured for 281 'study areas', mostly census tracts. Image analysis, a factor-analytic technique,

is used in the study. The most significant factors are briefly compared with the Shevky-Bell social space typology, and future research is outlined.

3.1.12 GUEST, Avery M. "The Applicability of the Burgess Zonal Hypothesis to Urban Canada," Demography, 6 (1969), 271-277.

ABSTRACT: A replication for Canada of Schnore's studies of socio-economic differentiation between United States central cities and suburbs produces generally similar results, although the Canadian patterns are by no means as pronounced or conclusive. Older, larger and highly sub-urbanized Canadian areas are most apt to have high-status groups over-represented in the central city. Furthermore, this pattern of socio-economic differentiation is found less often in Canadian areas than in the United States areas which tend to be older and larger. A study of change over time also suggests a movement toward socio-economic differentiation between city and suburb. These results are consistent with the Burgess zonal hypothesis which argues that lower-status groups increasingly inhabit the central section and upper-status groups the outskirts as cities grow.

3.1.13 HAMBURG, John Ro and CREIGHTON, Roger L., "Predicting Chicago's Land Use Pattern", J.A.I.P., special issue, May 1959, 67-72.

3.1.14 HANSEN, Walter G. "How Accessibility Shapes Land Use", J.A.I.P. (Special Issue), (May, 1959), 73-76.

The abstract states in part that: "An empirical examination of the residential development patterns illustrates that accessibility and the availability of vacant developable land can be used as the basis of a residential land use model." The article suggests a method for determining accessibility patterns and the model offered attempts to distribute the total metropolitan population growth to smaller areas within the region. Access (to commercial, industrial, and commercial facilities) is defined in terms of the potential for opportunities for interaction. A hypothetical example is included.

3.1.15 HERBERT, John D., and STEVENS, Benjamin H. "A Model for the Distribution of Residential Activity in Urban Areas," J.R.S., 2(2) (1960), 21-36.

The authors present a linear programming model for the distribution of residential activity in urban areas. It is part of a larger model constructed for the Penn-JerseyTransportation Study. Relevant definitions and constraints are discussed along with certain limitations which are characteristic of the technique.

3.1.16 HILL, Donald M., "A Growth Allocation Model For the Boston Region," J.A.I.P., special issue, May, 1965, 111-119.

3.1.17 HILL, Donald M., Daniel Brand and Willard B. Hansen, "Prototype Development of Statistical Land-Use Prediction Model for Greater Boston Region," Highway Research Record, No. 114, 1966.

3.1.18 IRWIN, Neal A. and Daniel Brand, "Planning and Forecasting Metropolitan Development," Traf. Q., XIX (October, 1965).

3.1.19 KAISER, Edward J. A Producer Model for Residential Growth: Analyzing and Predicting the Location of Residential Subdivisions. Chapel Hill: University of North Carolina (Center for Urban and Regional Studies , Institute for Research in Social Science), 1968.

3.1.20 LAROUCHE, Pierre, The Simulation of Residential Growth in the Montreal Region. Taken from a Master's Thesis at Yale University, January 1966.

3.1.21 LATHROP, George T. and HAMBURG, John R., "An Opportunity-Accessibility Model for Allocating Regional Growth," J.A.I.P., special issue, May, 1965, 95-102.

3.1.22 LOS ANGELES CITY PLANNING DEPARTMENT

(1) Population Projection Model - projects population by age, sex and colour. It then apportions the populations to subregions.
(2) Residential Location Model - Allocates projected households by type to subregions.

(1) Used to obtain overall estimates (projections) and will be used to test various plan alternatives. It is being run about once every two weeks.
(2) Still under development.

3.1.23 LOWRY, Ira S., A Model of Metropolis (RAND Corporation, Santa Monica, California, 1964).

3.1.24 MURDIE, Robert A. Factorial Ecology of Metropolitan Toronto - 1951-61: An Essay on the Social Geography of the City. Chicago: University of Chicago (Department of Geography, Research Paper No. 116), 1969. 212 pp.

After a discussion of relevant theory the author presents factor analyses of 1951, 1961 and change (1951-61) data for Metropolitan Toronto (86 variables for 1951, 78 variables for 1961, and 56 for the change analysis). In general the social geography of the city is seen to contain elements of both the Hoyt and the Burgess models. Economic status varies primarily in a sectorial fashion while family status is primarily zonal. Ethnic status (and its sub-dimensions in 1961) is seen to have facets of both sectorial and zonal variations but change in ethnic status is primarily sectorial. There appears to be a great deal of stability in the social ecology of Toronto between the cross sectional analyses.

3.1.25 MUTH, Richard F. "The Spatial Structure of the Housing Market," P.P.R.S.A., 7 (1961), 207-220.

A simple theory of the spatial structure of the housing market, based on economic equilibrium theory, is outlined. The model suggests a negative-exponential decline of residential population densities.

with distance from the city centre (c.f. Colin Clark), and Muth goes on to test this empirically against data for 46 United States cities in 1950. He concludes that it is 'probably the best simple approximation to the pattern of urban residential desnities'.

3.1.26 NEW YORK STATE DEPARTMENT OF PUBLIC WORKS - Subdivision of Transportation Planning and Programming.

A Direct Trip Allication Model. The purpose of this model is to allocate future urban development over a region taking into account such factors as accessibility, present vacant and developed land, exogenously supplied assumptions pertaining to future land use development and operational policies defining the availability of land for development. The model includes a provision for output which is directly compatible with the input requirements of the traffic simulation and assignment programs.

The model is used for projecting future development and determining travel demand. It has been used as a research tool and in planning and evaluating transportation systems.

3.1.27 NICHOLSON, T. G., and YEATES, M. H. "The Ecological and Spatial Structure of Socio-Economic Characteristics of Winnipeg, 1961," Canadian Review of Sociology and Anthropology, 6 (1969), 162-178.

A factor analysis of census population and housing data for metropolitan Winnipeg in a test of social area hypotheses of intra-urban spatial patterning.

3.1.28 PUGET SOUND REGIONAL TRANSPORTATION PLANNING PROGRAM

(a) Multiple regression model to distribute population gain to analysis areas in the region (single family dwelling units and multi-family structures with less than 20 units).

(b) Multiple regression model to estimate population loss in analysis area in the region (single family dwelling units and multi-family structures with less than 20 units.). Special analyses were made to estimate the distribution of population in structures with more than 20 units: hotels, motels, etc.

(c) Cross-section multiple regression models to estimate changes in the "repair services", "construction" and "medical, religious and institutional" employment categories. Special analyses were made to estimate the distribution of other employment categories

The models were used primarily for forecasting. Two alternative urban development patterns were delineated.

3.1.29 ROBSON, B. T. Urban Analysis - A Study of City Structure with Special Reference to Sunderland. Cambridge: The University Press, 1969. 250 pp. and Appendices.

The author utilizes the method of factorial ecology to create "multi-variate sub-areas" of Sunderland which serve as an areal

framework for detailed questionnaire based research into attitudes toward education. Two correlation analyses are performed; one on private housing and another on the total town (including council housing). The differentiation between the two correlation motives is interpreted in order to evaluate the effects of council house inclusion.

3.1.30 ROW, Arthur and JURKOT, Ernest, "The Economic Forces Shaping Land Use Patterns", J.A.I.P., special issue, May, 1959, pp. 77-81.

3.1.31 SCHLAGER, Kenneth J., "A Land Use Plan Design Model", J.A.I.P., special issue, May, 1965, pp. 103-110.

3.1.32 SCHLAGER, K. J., "A Recursive Programming Theory of the Residential Land Development Process", Highway Research Record, No. 126, 1966.

3.1.33 SOUTHEASTERN WISCONSIN REGIONAL PLANNING COMMISSION

(1) Land use simulation model provides a guide of public policies to guide land development and was used in a land use transportation study.

(2) Land use plan design model - A design of land use plans, the " model is still experimental (1967).

3.1.34 SWERDLOFF, Carl N., "Residential Density Structure: An Analysis and forecast with Evaluation", Highway Research Record, No. 207, 1967.

3.1.35 SWERDLOFF, Carl N. and STOWERS, "A Test of Some First Generation Residential Land Use Models", Highway Research Record, No. 126, 1966.

3.1.36 TWIN CITIES METROPOLITAN PLANNING COMMISSION (Minneapolis-St. Paul)

Land Use Model - Made intrametropolitan allocations of predetermined housing, population and employment (eight different groups) totals. Used to test alternative sets of assumptions and their role in shaping future physical development of metropolitan area and to derive statistical and geographical pictures of final plan land use and selected supporting facilities. Actually a program to link a series of linear regression equations.

Used to derive alternative distribution patterns based on different sets of assumed policies, i.e., to show the physical development results of policies planning - run for each of four alternatives and for final plan for total of five different patterns.

3.1.37 WEISS, Shirley F., and KAISER, Edward J. "A Quantitative Evaluation of Major Factors Influencing Urban Land Development in a Regional Cluster", Traf. Q., 22 (1968), 109-115.

This articles reports on a multiple retression analysis to explain

urban development patterns for a study area incorporating five North Carolina cities and using 1960 data. Six independent variables were used to explain 'total land in urban use' and 'total dwelling units'. Important variables were measures of distance to nearest high value intersection, access to major highways and to public water system, agricultural capability, and contiguity of urban use.

3.1.38 WENDT, Paul F. "Land Use Simulation Models," T. P. Rev., 41 (1970), 161-167.

3.1.39 WINGO, Lowdon, Jr. "An Economic Model of the Utilization of Urban Land for Residential Purposes", P.P.R.S.A., 7 (1961), 191-205.

This article describes a "statis intrametropolitan model of the urban household sector in which household decisions are assumed mutually independent and the paramenters fixed." These parameters are the (spatially distributed) economic characteristics of the population, and the model(which is abstract and not operational) distributes households spatially. Inputs include size and composition of population, characteristics of the transportation system, and other economic and institutional variables; output of the model is expressed as net residential density.

3.2 LAND USE SUCCESSION MODELS

3.2.1 *BOURNE, Larry S. Forecasting Land Occupancy Changes Through Markovian Probability Matrices: A Central City Example. Toronto: University of Toronto (Centre for Urban and Community Studies, Research Report No. 14), 1969. 22 pp.

Bourne reviews the principles of Markov-chain analysis and applies the concept to an exploratory simulation of land use conversion in the City of Toronto. Basic data are in the form of land use conversion probabilities (given information for the period 1952-62). The procedure is explained and the results reviewed and compared with those from direct extrapolation techniques (and with various Markov assumptions, e.g. constant and sequential probability). The model is then used to make predictions. Conceptual problems (such as those stemming from aggregation) are also discussed.

3.2.2 *BOURNE, Larry S. "Location Factors in the Redevelopment Process: A Model of Residential Change," L. Ec., 45 (1969), 183-193.

The author describes the building 'renewal cycle' and outlines a model of new construction for Toronto. His hypothesis is that new residential construction is a function of the existing stock of buildings, the relative accessibility of each area (to C.B.D., transit, etc.), the immediate environment, ease of land assembly, and vacant land available. A multiple regression model using these variables proves only weakly predictive. The author comments on locational variability of new construction, which makes accurate prediction very difficult, and also notes that the private redevelopment process is not removing the older and deteriorated housing stock.

3.2.3 *BOURNE, Larry S. Private Redevelopment of the Central City. Chicago: Department of Geography, University of Chicago (Research Paper No. 112), 1967. 199 pp.

Probably the only thorough study available on the nature and spatial patterning of private redevelopment. Amount of new construction investment, and allocation by type, are taken as given. The author begins by examining theories of urban morphology and growth, and explains rural-urban land conversion and central city redevelopment as complementary processes. His empirical investigation of Toronto gives a historical outline of development, then utilises detailed assessment records for 1952 and 1962 in examining structural changes. The study culminates in a predictive 'area redevelopment model' using multiple regression techniques.

3.2.4 *BOURNE, Larry S. "A Spatial Allocation - Land Use Conversion Model of Urban Growth," J. R. S., 9 (1969), 261-272.

The rationale and formulation of an allocation-conversion model

are described. The standard spatial allocation model of urban land development is modified by placing emphasis on central city building trends and locational patterns. Also, a 'conversion sub-model' is introduced, consisting of sets of probability matrices measuring the nature and scale of land-use succession through new construction.

3.2.5 *BOURNE, Larry S. "Trends in Urban Redevelopment - the Implications for Urban Form," Apr. J., 38 (1970), 24-36.

A presentation and analysis of data on redevelopment in the City of Toronto, 1952-62. Though apartments and offices dominated the statistics on floor area added, they represented only a small part of land area redeveloped (here automobile-related uses were more important). Five major growth areas are identified, four of them subway-oriented. The author notes a trend towards (1) greater disparity in density of development, and (2) increased specialisation. Also, a declining proportion of the city's land area is being subjected to redevelopment.

3.2.6 BURY, Richard L. "The Efficiency of Selected Site Characteristics as Predictors for Location of Land Use Shifts to Residential Purposes." Unpublished Ph.D. dissertation, Department of Economics, University of Connecticut, 1961.

3.2.7 CAPPER, G.C.F. and LEWIS, J. Parry. "Decay, Development, and Land Values," M.S.E.S.S., 32 (1964), 25-41.

The authors begin by defining a number of 'conditions of obsolescence' in which a building may be, namely tenant obsolescence, and various forms of landlord obsolescence (rental-, condition-, and building-obsolescence, also decay). Each of these conditions will lead to a change of state, specifically to a change in tenant or rent, or to building improvement, demolition, or neglect, respectively. Reasons for the various conditions are explored. In Part II of the article a primative simulation model is described, and future research, which will centre on the decision to allow decay, and the decision to redevelop, is outlined. Throughout, most of the examples given are industrial.

3.2.8 CLARK, W.A.V. "Markov Chain Analysis in Geography: An Application to the Movement of Rental Housing Areas," A.A.A.G., 55 (1965), 351-359.

Markov chains are among probability processes which can be used to analyse movements of units through time. Definitions and theorems associated with Markov chains are kept to a minimum and the usefulness of the transition probabilities and the transition probability matrix are described in detail. An example of the movements of central city census tracts based on the average contract rents of rental housing is presented. In conclusion,

possible applications of transition probabilities are suggested. For example, Markov chain analysis is most effectively applied where data are numerous and large numbers of time periods are involved.

3.2.9 DREWETT, J.R. "A Stochastic Model of the Land Conversion Process: An Interim Report," Reg. Stud., 3 (1969), 269-280.

A general discussion of the systems approach to urban studies is followed by an outline of proposed research on the (rural to urban) land conversion process. Four hypotheses are advanced for future testing. Later, a stochastic model is used to predict changes in the system from an empirically derived 'state at time one'; this is compared with actual growth, and the residuals are studied. Problems of the method and future plans of the research team are also discussed. Further work by this study group should be available in forthcoming Political and Economic Planning broadsheets.

3.2.10 FISHER, H. Benjamin. The Renewal of Urban Land: Process, Decisions, and Simulation. Chapel Hill, N.C.: Center for Urban and Regional Studies (Environmental Policies and Urban Development Thesis Series, No. 7), 1967. 162 pp.

This M.R.P. thesis is an analysis of renewal which parallels the Chapel Hill studies of the land development process (see particularly that by WEISS, et al., 1966: 3.2.18); renewal is loosely defined to include any substantive improvement to a property subsequent to its initial development. The conceptual framework sees land as passing through a sequence of states, with a key decision agent influencing each change of state. In chapter III the renewal process is thoroughly examined in the light of this conceptual outline, and investment decisions are analysed. Finally the author outlines a simulation model of the renewal process.

3.2.11 GRAVES, Charles H., "Two Multiple Regression Models of Small-Area Population Change," Highway Research Record, No. 102, 1965.

3.2.12 KAISER, Edward J. et al. "Predicting the Behaviour of Predevelopment Landowners on the Urban Fringe," J.A.I.P., 34 (1968), 328-333.

This article presents a 'landowner model', which combines landowner characteristics (length and type of ownership, whether resident, occupation), and property characteristics (proportion unsuitable or already urban, zoning protection, parcel size and value, distance from C.B.D.), to yield probabilities of the land being sold for urban development. When applied to two North Carolina towns, it correctly classified 60-80 percent of land over a ten-year period.

3.2.13 MUTH, Richard F. "Economic Change and Rural-Urban Land Conversion," Econometrica, 29 (1961), 1-23.

Abstract: This paper considers the problem of rural-urban land conversions as a special case of the more general one of how equalibrium location of firms in a Von Thunen plain changes with changes in the conditions of demand and supply for the commodities they produce. After treating the problem of equalibrium location rather generally, a (mathematical) model involving specific assumptions about the relevant functional relationships is developed in detail. Some tentative conclusions about the direction of land conversions are reached on the basis of the probable magnitudes of a few strategic parameters.

3.2.14 ROBINSON, Ira M., WOLFE, Harry B. and BARRINGER, Robert L. "A Simulation Model for Renewal Programming," J.A.I.P., 31 (1965), 126-133.

This article describes a computerised model to simulate the operations of the housing redevelopment market and the effects of public planning activity over time. Main elements in the model are the housing stock, its 'users', investors (assumed to respond to yield), and public actions (hypothetical alternative programs entered directly into the computer). Designed for San Francisco, the model operates in two-year iterations. It attempts to simulate (i) the location decisions of different users of space, (ii) investment behaviour of private investors, and (iii) public policies, programs and actions.

3.2.15 ROBINSON, I.M., WOLFE, H.B. and BARRINGER, R.L., "A Simulation Model for Renewal Programming," J.A.I.P. vol. 31 (March 1965).

3.2.16 SHOUP, Donald. The Optimal Timing of Land Development. Los Angeles: The University of California (Institute of Government and Public Affairs, MR-123), 1969.

An econometric discussion of the timing of land conversions, based on the Wicksell model. Optimal date for development or redevelopment is explained as depending on the discount rate, property tax rates, earnings in interim use, and expected future change in 'highest and best use'.

3.2.17 STEGER, Wilbur A. "The Pittsburgh Urban Renewal Simulation Model," J.A.I.P., XXXI (March 1965).

3.2.18 WEISS, Shirley F., DONNELLY, Thomas G., and KAISER, Edward J. "Land Value and Land Development Influence Factors: An Analytical Approach for Examining Policy Alternatives," L. Ec., 42 (1966), 230-233.

A report on the use of a multiple regression model to predict land-use changes in the Greensboro Urban Area. Nineteen-sixty data on

up to 14 independent variables, used in a similar study** are now compared to 1963 assessments of land use and value. The variables predict land value better than land-use; reasons for this are discussed. (** 3.1.4).

3.3 LOCATION MODELS

3.3.1 ARMINGER, L.E., Jr. "Toward a Model of the Residential Location Decision: A Study of Recent and Prospective Buyers of New and Used Homes." Unpublished thesis, University of North Carolina, 1966.

3.3.2 BERRY, Brian J.L., "The Retail Component of the Urban Model," J.A.I.P., special issue, May 1965, 150-155.

3.3.3 *BOURNE, Larry S. "Market, Location, and Site Selection in Apartment Construction," Can. Geog., 12 (1968), 211-226.

This article begins by examining the recent growth in apartment construction, and market conditions which have encouraged that growth. Subsequently the author looks at traditional residential location theory and its relevance in accounting for apartment location. In the second section of the paper a 'formal set of locational parameters are hypothesised and tested against both aggregate distribution and site selection process of apartment construction.' Empirical data used is for Toronto, 1952-63, and was compiled from building permit statistics and assessment records.

3.3.4 *BRIDGER, M. Keith, and GREER-WOOTTEN, Bryn. "Landscape Components and Residential Urban Growth in Western Montreal Island," Revue de Geographie de Montreal, 19 (1965), 75-90.

The relationship between landscape components and urban residential growth is studied in some western Montreal Island communities. Land within one half mile of commuting access to the C.B.D. is regarded as available for development. Actual development (by 1/25th square mile grid squares) is compared to hypothetical growth evenly from the core, and a deviation index is assigned. It was found that high positive deviation indicated landscape attractive to settlement (especially shore lines), and high negative deviation indicated unattractive land (especially poorly-drained areas). (Adapted from an abstract in Geographical Abstracts, 1967, D, p. 114).

3.3.5 BROWN, Lawrence A., and LONGBRAKE, David B. "On the Implementation of Place Utility and Related Concepts: The Intra-Urban Migration Case," in Behavioural Problems in Geography: A Symposium. Kevin R. COX, and Reginald G. GOLLEDGE (eds.). Evanston, Illinois: Northwestern University (Department of Geography), 1969. 169-196.

The article offers means of operationalising the concepts of awareness space, search space and place utility. The authors suggest the use of factor analysed O-D zones and linear programming methodology applied to "some sort of place utility function." Alternative approaches and steps are mentioned.

3.3.6 BUTLER, Edgar W. et al. Moving Behaviour and Residential Choice: A National Survey. Highway Research Board: National Cooperative Highway Research Program Report No. 81, 1969. 129 pp.

A thorough and valuable study, based on personal interviews with 1500 households in metropolitan areas across the U.S.A. In chapter 2 housing and neighbourhood preferences are analysed, then in chapter 3 recent movers are grouped by type of move and compared socio-economically (significant differences are found). The fourth chapter examines prospective moves, and the fifth presents an 'explanation of residential choice', assessing various factors as predictors of the choice process. Chapter 6 is a generalised discussion of modeling urban mobility and residential choice, while Appendix A is a valuable review of nearly 20 different residential location models. Throughout, the report is copiously illustrated with data from the study (120 tables included).

3.3.7 *CHAMBERLAIN, Simon B. "Suburbanisation and Household Location Decisions." Unpublished B.A. Thesis, University of Toronto, Department of Geography, 1970. 54 pp.

The author investigates a number of explanations for suburbanisation, notably job shifts, push and pull factors connected with the environment and the forces of the housing market. He then proceeds to analyse the search for a new home, utilizing the Brown-Moore model (built about the concepts of place utility, search space and awareness space).

3.3.8 CHAPIN, F. Stuart Jr. "A Model for Simulating Residential Development," J.A.I.P., 31 (1965), 120-125.

Chapin refers to the development of a consumer model which utilizes measures of attractiveness (at first based on shelter costs). The individual's decision as to residential location is conditioned by: (1) choice and intensity of residential development as prescribed in the general plan and by zoning; (2) what the producers offer (shelter package, price and general accessibility of the site); (3) what the household purse allows; (4) what household activity patterns call for, and what taste norms dictate. The output of a producer model (based on 1 and 2 above) will supply the basis for the consumption model. The author discusses the relevance of activity systems to the production of such a linked model.

3.3.9 DEUTSCH, Karl W. "On Social Communication and the Metropolis," Daedalus, 90 (1961), 99-110.

If the metropolis is thought of as an engine of communication, whose performance is measured by the number of contact-choices offered to its inhabitants, then the disease of modern cities is

communication overload. In this context the move to the suburbs is regarded as an escape from overloads, from the frustration of city living. In concluding the author offers a strategy of search for solutions.

3.3.10 DUNCAN, Beverly, and DUNCAN, Otis, D. "The Measurement of Intra-City Locational and Residential Patterns," J.R.S., 2 (1960), 37-54.

This exploratory paper deals with the relationship between the pattern of industrial location and the pattern of residential differentiation by industrial groups. The authors utilize an index of Work Place Potential to map the industrial location patterns for the Chicago Metropolitan District (1951). Preliminary observations suggest that the residential pattern (of an industrial category) is moulded by the locational pattern of the industry, the occupational composition of the work force and the residential pattern of the relevant occupational groups.

3.3.11 ELLIS, Raymond H. "A Behavioural Residential Location Model." Unpublished M.Sc. thesis, Civil Engineering, Northwestern University, Evanston, Illinois, 1966. 159 pp.

Discusses in detail the problems involved in developing a residential land use model. See Ellis, 1967, for a discussion of one aspect of this work.

3.3.12 ELLIS, Raymond H. "Modeling of Household Location: A Statistical Approach." Washington, D.C.: Paper Presented at the 46th Annual Meeting of the Highway Research Board, January, 1967. 21 pp.

This paper is presented as an exploratory investigation into one land-use prediction problem. The basic premise of operation is that the choice of a home is "an essentially rational decision" which takes into consideration housing preference, family income, and the conditions of the housing market. The calibration of the model's environmental vector is discussed and methodology and assumptions are specified. Environmental selection seems to be related to three factors: income, stage in the family life cycle, and race. A major deficiency in the model results from lack of data on consumer preferences and behaviour. The author suggests the use of games in which households are asked to choose among locations which have varying attributes, and to explain their choices.

3.3.13 FIDLER, Jere, "Commercial Activity Location Model," Highway Research Record, No. 207, 1967.

3.3.14 KAIN, John F. "The Journey to Work as a Determinant of Residential Location," P.P.R.S.A., 9 (1962), 137-160.

The paper presents and tests a model of residential location

which assumes that the journey to work (and the costs involved there) along with the cost of residential space can be utilized as indicators. Assumptions include the belief in utility maximization and the assumption that residential space is not an inferior good. The testing provided offers support for the model construct.

3.3.15 KAISER, Edward J. "Locational Decision Factors in a Producer Model of Residential Development," L. Ec., 44 (1968), 351-362.

It is argued that the developer plays a key role in determining the spatial distribution of residential growth. Using micro-economic theory of the firm, the developer's decision is seen as one of profit maximisation; the locational decision is "treated as a significant part of the entrepreneur's overall judicious selection of the inputs and outputs which determine profit." Site characteristics, decision-agent characteristics, and consumer preferences, are all seen as influencing the structure of the profit and production function. An empirical analysis provides evidence of the importance of site characteristics.

3.3.16 KAISER, Edward J., and WEISS, Shirley F. "Public Policy and the Residential Decision Process," J.A.I.P., 36 (1970), 30-37.

The authors outline their decision model of the development process, and assess the role of public policy decisions at each stage. Government can influence the predevelopment landowner by taxation and other policies affecting present value and future benefits. The developer's locational decision will be influenced by policies affecting the contextual and property characteristics - zoning, schools, services, and stability of policy all affect these. Household decisions are influenced less, but can be affected by services, zoning protection, and open housing laws.

3.3.17 LANSING, John B., and BARTH, Nancy. Residential Location and Urban Mobility: A Multi-Variate Analysis. Ann Arbor: University of Michigan (Survey Research Center, Institute for Social Research), 1964. 75 pages and Appendices.

This study is a micro-analysis of two interrelated decisions: the choice of residential location and the choice of transportation mode for the journey to work. Residential location is thought of in terms of present distribution (what are the important variables which help explain residential location) and in terms of future plans to change location (what are the forces which encourage migration and where do people go in response to these forces).

3.3.18 LATHROP, George T. and John R. HAMBURG, "An Opportunity-Accessibility Model for Allocating Regional Growth," J.A.I.P., XXXI (March 1965).

3.3.19 MARBLE, Duane F., and NYSTUEN, John D. "An Approach to the Direct Measurement of Community Mean Information Fields," P.P.R.S.A., 11 (1963), 99-109.

The writers develop the basis of a simulation model of migration: the concept of Mean Information Field. The discussion centres on the use of surrogate measures of the M.I.F. and on the need to account for directional distortions in simulation (within the M.I.F. rather than by way of barriers to communications as used by Hagerstrand).

3.3.20 PUTNAM, Stephen H., "Intraurban Industrial Location Model Design and Implementation," P.P.R.S.A., XIX (1965).

3.3.21 RECHT, J. Richard. "Bay Area Simulation Study: Residential Location Model," An. R. S., 2 (1968), 142-152.

Describes a residential location model which postulates six separate markets each with its own supply, demand, and accessibility characteristics. Firstly demolition and filtering are forecast. Then supply of and demand for new housing units is predicted, and spatial location is assumed to be a function of accessibility to employment.

3.3.22 STEGMAN, M.A. "Accessibility Models and Residential Location," J.A.I.P., 35 (1969), 22-29.

Abstract: Many residential location models have been developed within the context of long-range transportation planning programs and tend to explain housing consumer behaviour largely in terms of minimizing the journey to work. This article questions the pre-eminence of accessibility in the residential location process and offers empirical evidence.

3.3.23 VOORHEES, Alan M. "Urban Growth Characteristics," Urb. Land, 20 #11 (1961), 3-6.

In this rather simplistic application of multivariate methods, Voorhees describes the use of multiple correlation analysis to measure the importance people place on various factors in making their locational decisions. An analysis of the Hartford area, using nine variables, revealed that availability of land and sewer facilities were most important. A general conclusion is that "the automobile has freed the family transportation-wise so that it can afford to weigh other factors in the selection of a home." The author makes similar observations about manufacturing and retail locations.

3.3.24 WILSON, A.G. "Developments of Some Elementary Residential Location Models," J.R.S., 9 (1969), 377-385.

3.4 MIGRATION AND TRAVEL MODELS

3.4.1 BALTIMORE REGIONAL PLANNING COUNCIL.

(1) Design-day participation is specific outdoor recreation activities (DDPRA). This model is composed of several submodels, one for each selected recreation activity. It produces planning data for small areas of the region. Used as input to (2).
(2) Recreation trip distribution model (RTDM) applies a form of gravity model in estimating the destinations of recreation trips by predominant activity. Analysis from model results provides information on intensity of activity by location. Model produces target date supply requirements for locations.

Plan design: Basis for interagency discussions regarding physical plan elements; particularly with specialists in recreation and park activities. Used to aid specialists outside agency in making land acquisitions decisions. Several runs have been made during past year's planning effort.

3.4.2 CLARK, W.A.V. "Information Flows and Intra-Urban Migration: An Empirical Analysis," Pr. A. A. G., 1 (1969), 38-42.

In applying the concept of Mean Information Field (M.I.F.) to the pattern of intra-city migration the article suggests (on the basis of the degree of association between actual and simulated patterns) "that all activity systems are useful surrogates for predicting household migration within the urban area." M.I.F. is used as a measure of "awareness space" (or the perceived mental map of the city) and information flows based on banking services reproduce the actual patterns most closely.

3.4.3 CLARK, W.A.V. "Measurement and Exploration in Intra-Urban Mobility," T.V.E.S.G., (Jan./Feb., 1970), 49-57.

Clark tests a number of generalisations on why people move, utilising sampled data for Christchurch, New Zealand. He also attempts to simulate the pattern of intra-urban migration using two mean information fields and Monte Carlo simulation techniques. Simple regression methods are used to evaluate the correspondence between the simulations and the actual pattern. Correlation coefficients varied from .50 to .97 between the actual and simulated patterns.

3.4.4 CLEVELAND-SEVEN COUNTY TRANSPORTATION-LAND USE STUDY. Direct Trip Allocation Model (see description under entry for New York State Department of Public Works).

It is anticipated that the model will be used extensively in the near future to allocate projected urban activities. It will provide inputs for a trip distribution model and a "traditional" urban planning program. It will serve as a vehicle for evaluating

certain aspects of both transportation and land use proposals. Only preliminary allocations have been attempted thus far.

3.4.5 GOODMAN, Leo A. "Statistical Methods for the Mover-Stayer Model," J.A.S.A., 56 (1961), 841-868.

The mover-stayer model, a generalisation of the Markov chain model, assumes that there are two types of individuals in the population under consideration: a) the 'stayer', who with probability remains in the same category during the entire period of study; b) the 'mover', whose changes in category over time can be described by a Markov chain with constant transition probability matrix. Most of the discussion concerns estimators of parameters and their accuracy - largely a critique of a paper by Bluren, Kogan and McCarthy. In addition, tests of several hypotheses concerning the mover/stayer model are presented. (Modified Abstract).

3.4.6 HUFF, D.L. "A Topographic Model of Consumer Space Preference," P.P.R.S.A., 6 (1960), 159-173.

The article attempts to: (1) identify elements that affect consumer travel-making decision, (2) investigate the connections and relations among these elements, and (3) examine the relative degree of interdependence of each of these elements. The discussion develops the space preference concept (Walter Isard) using graph theory and matrix algebra. Elements discussed include: stimulus situation, physiological drive, desideratum, value system, behaviour-space perception, and movement imagery. The sub-elements of this typology of elements are also discussed, as are the linkages between the noted elements. The model provides a basis for empirical investigation into the conditioning of consumer space-preferences. It may provide the basis for a predictive model, but only after it has been empirically evaluated and reformulated.

3.4.7 JOHNSTON, R.J. "Some Tests of a Model of Intra-Urban Population Mobility: Melbourne, Australia," Urb.Stud., 6 (1969), 34-57.

The author presents and tests five hypotheses related to a model of intra-urban population mobility. The data were from the 1964 Melbourne Metropolitan Transportation Study (30,000 interviews) and in general supported the operational contention that 1) the majority of population movements within Melbourne are over short distances and toward the urban periphery, and 2) Melbourne's inner residential areas are the major focus for in-migrants from abroad (especially for those from South Europe). The findings suggest that the family cycle model is probably much more valid than the others presented, as an explanatory generalisation. As the writer warns, however, the entire complex pattern cannot be displayed with such simple data (i.e. 10 districts).

3.4.8 LOWRY, Ira S. "Migration and Metropolitan Growth: Two Analytical Models." Los Angeles: University of California (Institute of Government and Public Affairs), 1966.

3.4.9 MARBLE, Duane F. "A Theoretical Exploration of Individual Travel Behaviour," in Quantitative Geography - Part 1: Economic and Cultural Topics, W.L. GARRISON, and D.F. MARBLE, (eds.) Evanston, Illinois: Northwestern University (Department of Geography), 1967. 33-53.

The article applies game-theoretic models to decision aspects of travel behaviour (trip selection and route selection). It is noted that while such structures provide normative models of travel behaviour, there are great difficulties in applying them to empirical situations. Simulation models based on simpler probability structures and bypassing the complexity of the formal decision models might well offer additional research opportunities.

3.4.10 MARBLE, Duane F., and BOWLBY, Sophia R. "Shopping Alternatives and Recurrent Travel Patterns," in Geographic Studies of Urban Transportation and Network Analysis, Frank HORTON, ed. Evanston, Illinois: Northwestern University (Department of Geography), 1968. 42-75.

Utilizing travel behaviour data (Cedar Rapids, Iowa, 1949) the article relates various trip types to a theoretical framework based on the concepts of opportunity set (which includes those locations which might be visited), and choice space (which includes those locations which are visited), as well as the believe in economically rational behaviour. That repetition which is discovered is seen to be an indicator of the stability of the activity system. On the basis of the limited empirical content which is presented, the model is found to be valuable in the study of travel behaviour. Those consistencies which emerge might well relate to the impact of travel on the perception of the urban environment.

3.4.11 MOORE, Eric G. "Models of Migration and the Intra-Urban Case," A.N.Z.J.S., 2 (1966), 16-37.

This is an attempt to bridge the gap between migration and mobility studies by assessing the value of several models of migration in the intra-urban context. The discussion distinguishes between descriptive, explanatory, and predictive models, as well as utilizing an areal/non-areal classification. Finally, emphasis is put on the consideration of the behaviour of the individual within the urban frame, and an appropriate model is suggested.

3.4.12 MOORE, Eric G. "The Structure of Intra-Urban Movement Rates: An Ecological Model," Urb. Stud., 6 (1969), 17-33.

Moore applies Blalock's method of causal analysis, which utilizes simple and partial correlation coefficients, to an ecological

analysis of associations between intra-urban migration rates and selected socio-economic and demographic variables in Brisbane, Australia. An initial causal model derived from previous studies is tested and reformulated.

3.4.13 NYSTUEN, John D. "A Theory and Simulation of Intra-Urban Travel," in Quantitative Geography - Part 1: Economic and Cultural Topics, W.L. GARRISON, and D.F. MARBLE, (eds.). Evanston, Illinois: Northwestern University (Department of Geography), 1967. 54-83.

Based on concepts related to Central Place Theory and the area of activity systems analysis, the author constructs a theoretical framework (postulates and theorems of shopping centres and associated travel, retail firm behaviour), and builds a simulation model of customer movement. The model, as it stands, "fits actual movement quite poorly". However, a number of alterations are suggested (i.e.: adding an additional Monte Carlo process asking for the level of center in which the store is found).

3.4.14 SMITH, Wallace F. Filtering and Neighbourhood Change. Berkeley: University of California (Center for Real Estate and Urban Economics, Institute for Urban and Regional Development, Research Report No. 24), 1964. 79 pp.

The author reviews the idea of filtering, as expressed in the theories of Hoyt, Firey, and others, then turns to modern matrix approaches to the subject. Having described the rudiments of a matrix approach, he carries out an empirical study of the City of Oakland, finding (1) racial composition, (2) ownership level, and (3) dwelling value to vary systematically. Inter-relationships between these are examined: racial change and housing value change are found not related, though housing tenure-ownership and value change are closely related.

3.4.15 WOLPERT, J. "Behavioural Aspects of the Decision to Migrate," P.P.R.S.A., 15 (1965), 159-169.

While the author is primarily interested in national, non-intra-urban variants of migration, certain aspects of this paper can be related to the intra-urban case. The mover-stayer problem is defined by three notions: (1) the notion of place utility, (2) the field theory approach to search behaviour, and (3) the life-cycle approach to threshold formation (of place utility). The proposed operational model requires the integration of the three notions and the classification of the population into homogeneous subgroups which have different migrational characteristics.

3.5 ECONOMIC MODELS

3.5.1 BALTIMORE REGIONAL PLANNING COUNCIL.

(1) Industrial Projections Model 1. To project total regional industrial activity by employment. Industrial Projections Model 11. To translate regional employment projections to estimates of number of firms by behavior category. Industrial Projections Model 111. To allocate firms to transportation district by matching behavioral groups with policy characteristics of the locations. Model 1--primarily projection will be used for plan evaluation. Model 11--projection analysis and plan evaluation. Model 111--primarily plan evaluation (all three models currently being used for the first time).

(2) Retail Market Potential. The model is designed to estimate retail market potential in terms of estimated annual sales volumes, of large-scale retail centers. It does so by evaluating a region-wide retail system against a given highway network, population, and disposable income distribution. The model has been used to design the commercial element of one land use plan and subsequently used to evaluate the commercial element of another.

3.5.2 BRIGHAM, Eugene F., "The Determinants of Residential Land Values," L. Ec., XLI (November 1965).

3.5.3 BRIGHAM, Eugene F. A Model of Residential Land Values. Santa Monica, Calif.: The RAND Corporation (Memorandum RM-4043-RC), 1964. 91 pp.

A theoretical model is first outlined, relating land values to amenities, accessibility, and other factors. Regression equations (based on the model) are fitted to empirical data collected along three rays from downtown Los Angeles. Four models are fitted for single-family land use and four for all land uses (one for each ray and one for all rays combined). Stability is enough to confirm the basic nature of the relationship, but random variations make the model too unstable to use for accurate predictions of individual parcel land values.

3.5.4 GOLLEDGE, Reginald G. A Conceptual Framework of a Market Decision Process. Iowa City, Iowa: The University of Iowa (Department of Geography, Discussion Paper No. 4), April 1967. 16 pp.

The application of a learning model to decision-making in the market place offers a useful analogy to other processes which intuitively involve the expansion of knowledge with time. The producer who arrives anew in some market environment will have little or no knowledge of the range of rewards which are open to him. His early behaviour will provide a basis for future actions and these will depend on his experiences (positive and negative) and his temperment (optimist or pessimist). A Markov-chain

based model can program for the various states of knowledge which occur over time for the subject. The author deals with the mathematics of his theoretical construct and makes suggestions as to those assumptions which apply to his case.

3.5.5 HARRIS, Curtis C., Jr. "A Stochastic Process Model of Residential Development," J. R. S., 8 (1968), 29-39.

The model uses a semi-Markov process to move between the states 'undeveloped' and 'developed', with probabilities dependent on accessibility. A simplified hypothetical example is presented, and the technique is applied to predict change for Sacremento County, California. Simplifying assumptions and problems of the model are discussed.

3.5.6 HARRIS, Curtis C., Jr. A Stochastic Process of Suburban Development. Berkeley: University of California (Center for Real Estate and Urban Economics, Institute of Urban and Regional Development), Technical Report No. 1, 1966. 106 pp.

A detailed discussion of the model summarized in 3.5.5 (above). Details of computations and rationale are given, and the author presents a critique of his model.

3.5.7 KNOS, Duane S. "The Distribution of Land Values in Topeka, Kansas," in Spatial Analysis, B.J.L. BERRY and D.F. MARBLE, eds. Englewood Cliffs, N.J.: Prentice-Hall Inc., 1968. pp. 269-289.

The author tests a number of hypotheses which purport to describe the spatial character of urban land values. The restated individual relationships are retested in multiple regression form. Tests of partial correlation eliminated population potential as a meaningful variable and distance from Peak Value Intersection, distance from Kansas Ave. (the major business thoroughfare), and the rate of growth of a sector were left in the equation. Residuals from regression are analysed and evaluated. The model is evaluated and implications suggested.

3.5.8 LAKSHMANAN, T.R. and Walter A. HANSEN, "Market Potential Model and Its Application to a Regional Planning Problem," Highway Research Record, No. 102, 1965.

3.5.9 LAKSHMANAN, T.R. and HANSEN, Walter G., "A Retail Market Potential Model," J.A.I.P., special issue, May 1968, 134-143.

3.5.10 MORRILL, Richard L. "Expansion of the Urban Fringe: A Simulation Experiment," P.P.R.S.A., 15 (1965), 185-199.

Morill's study builds to some extent on the Chapin-Weiss model, but takes a relatively localised approach. Expansion of part of Seattle's urban fringe is simulated for the period 1957-64, under

the assumption that fringe development is a spatial diffusion process, random in direction but following an inverse probability distribution with variations in land and neighbourhood quality. The model predicts change for individual lots, and probabilities for type of development are made a function of land-use zoning. Density of development, and location of schools and shopping centres, are also predicted.

3.5.11 MUTH, Richard F. Cities and Housing. Chicago: University of Chicago Press, 1969. 355 pp.

Muth, an economist, presents a series of models aimed at explaining the operation of the price system in the market for urban housing and residential land. In particular, his models explain in aggregate terms the allocation of housing in urban space, the consumption of housing per household (and the quality of housing consumed), and housing output per unit of residential land for different areas of the city. The book includes five chapters on 'theoretical analysis', five on 'empirical findings', and two on 'conclusions and implications'.

3.5.12 SOUTHEASTERN WISCONSIN REGIONAL PLANNING COMMISSION.

Regional Economic Simulation model - to provide conditional forecasts of economic activity. Used in a land use transportation study.

3.5.13 WEISS, S.F., T.G. DONNELLY and E.J. KAISER, "Land Value and Land Development Influence Factors: An Analytical Approach for Examining Policy Alternatives," L. Ec., XLII (May 1966).

3.6 INFRASTRUCTURE MODELS

3.6.1 BALTIMORE REGIONAL PLANNING COUNCIL

(1) The Baltimore Model - 1962. This model or series of related submodels was given no name. It was a significant step however, in the development of projection techniques for transportation studies. See Baltimore Regional Planning Council, A Projection of Planning Factors for Land Use and Transportation, by Alan M. Voorhees & Associates, Inc., and Wilbur Smith & Associates, March, 1963. Given 1962 traffic generation and attraction factors (land use, population, and employment for small areas) the model generated similar characteristics for 1980. It was an accounting type model which operated within overall regional forecasts. Used for projection of data by small area for transportation system analysis.

(2) Metropolitan Sewer System Model. To be used in the design of portions of a sewer system, given land use data and constraints of the natural land features. This model is now being designed. It will be used for evaluating the effect of alternate land use patterns on utility requirements. Determining the implications of alternate sewer systems on land use also is an anticipated use.

3.6.2 BEVIS, Howard W., "A Method for Predicting Urban Travel Patterns," J.A.I.P., special issue, May 1959, 87-89.

3.6.3 BOOTH, James and MONIS, Robert, "Transit vs. Auto Travel in the Future," J.A.I.P., special issue, May 1959, 90-95.

3.6.4 BRAND, Daniel, Brian BARBER and M. JACOBS, "Technique for Relating Transportation Improvement and Urban Development Patterns," Highway Research Record, No. 207, 1967.

3.6.5 CALLAND, William B., "Forecasting Traffic for Freeway Planning," J.A.I.P., special issue, May 1959, 82-86.

3.6.6 DISTRICT REGIONAL LAND USE AND TRANSPORTATION STUDY
Facilities Model. The Facilities Model is essentially an impact analysis model. It will measure the effect of new land use and activity distribution on the sewer and water systems through a measure of system capacity by area, peak design capacity needed by area. Generation factors for land use type will be developed and applied to zonal distributions and the effect on the existing system and new systems measured. Unit cost contours for development will be produced for the given system assuming certain operating characteristics. The facilities model will also generate a level-of-service index by zone as an input to the regional allocation model.

3.7.0 INFORMATION COMMUNICATION MODELS

3.7.1 BROWN, Lawrence A., and MOORE, Eric G. Diffusion Research in Geography: A Perspective. Iowa City, Iowa: The University of Iowa, (Department of Geography, Discussion Paper No. 9), 1968. 54 pp.

This review features a discussion of various simulation techniques which have been applied to migration and the diffusion of innovations. Particularly interesting is the discussion of alternatives and additions to the simple distance bias, acquaintance circle bias, reflexive or reciprocity bias and forced field or popularity bias). Each of these alternatives implies a different type of probability surface and/or a more complex simulation process (e.g.: Markov chain).

3.7.2 HAGERSTRAND, Torsten. "On Monte Carlo Simulation of Diffusion," in Quantitative Geography - Part I: Economic and Cultural Topics, W.L. GARRISON, and D.F. MARBLE, (eds.). Evanston, Illinois: Northwestern University (Department of Geography), 1967. 1-32.

Hagerstrand's treatment of Monte Carlo simulation includes a discussion of the neighbourhood effect (the diffusion of techniques and ideas through a network of social contacts). Information (about the landscape or on some innovation) can be transmitted by personal contact or by way of indirect mechanical contact (the telephone). When local migration is considered one discovers the characteristic relationship with distance from the origin which allows for the Monte-Carlo simulation of a process. The author also mentions alterations to the isotropic model which take into consideration physical obstacles (or conversely - lines of least resistance) with built in resistance factors. (NOTE: the author does not mention migration assumptions which are directly applicable to the intra-urban case).

3.7.3 MORRILL, Richard L., and PITTS, Forest R. "Marriage, Migration, and the Mean Information Field: A Study in Uniqueness and Generality," A.A.A.G., 57 (1967), 401-22.

This work is an extension of the Marble and Nystuen article (3.3.19). The aggregation of individual fields allows for the creation of a community mean information field which can be utilized in a computer simulation of information spread, etc. Data on spatial behaviour which can be utilized for the definition of individual information fields includes that on shopping, the journey to work, marriage and migration. It is found that, in general, Pareto formulations work better for cases not involving permanent or costly moves while exponential functions work better for migration and marriage distances.

3.7.4 WOLPERT, Julian. "The Decision Process in Spatial Context," A.A.A.G., 54 (1964), 537-558.

The results of an empirical investigation into the spatial variations in productivity of farmers in Middle Sweden are presented. It is demonstrated that the normative concept Economic Man cannot accurately describe farmer behaviour. However, when the farmer is seen as a spatial satisficer, and a lag in the communications process is allowed for, his actions can be understood.

3.8.0 UNCLASSIFIED MODELS

3.8.1 CHAPIN, F. Stuart Jr., "Activity Systems and Urban Structure: A Working Schema," J.A.I.P., Jan. 1968, 11-18.

3.8.2 DETROIT REGIONAL LAND USE AND TRANSPORTATION STUDY

Environmental Impact Model (Report). The regional plan that we hope to develop will be sensitive to environmental design quality. To accomplish this, we are developing a typology of environmental units which analytically describes the component characteristics of an area. Such typology will completely describe the entire region and assign through inituitive and objective measurements a quality rating to the environmental unit. Development of alternative plans will be influenced by the desire for change towards alternative environmental unit types, and the development of the future plan will be measured against criteria for such change. The method used here is sufficiently analytical and capable of reproduction to be termed a model. The value of this is in the ability to foretell the characteristics of an environmental unit implied in a plan alternative. Suboptimization Models for regional subsystems in the area of industry, commerce, housing, and recreation will be developed to refine a chosen plan alternative. The development of such models will occur in the later stages of the planning program.

3.8.3 GOLLEDGE, Reginald G., and BROWN, Lawrence A. "Search, Learning, and the Market Decision Process," Geog. An., 49 (1967), 116-124.

The authors discuss the application of a learning model to search behaviour. Markov chains are utilized in modeling search behaviour.

3.8.4 GOULD, Peter B. On Mental Maps. Ann Arbor, Michigan: University of Michigan (Michigan Inter-University Community of Mathematical Geographers, Discussion Paper No. 9), 1966. 53 pp.

The paper is a loosely structured discussion of spatial images: the mental maps that are in the minds of men. Increasingly, decision-making is tied to this mental image of reality as "more traditional location factors" decline in relevance. Migration, whether across country or across town, will be destination selective, reflecting (theoretically) a rank order listing of preferences. Gould suggests the use of factor analysis on a correlation matrix of sampled rank order preference listings. Factor scores of the basic dimensions offer an indication of the pattern of locational preference. Examples of the process include the United States as perceived from various states; Europe as perceived from several nations; Ghana and

Nigeria as perceived by a future elite - i.e.: university students. In the last example, the spatial allocation of future development is thought to depend upon the mental map of a small elite in government. This methodology offers a number of take-off points which may be applicable to the study of intra-urban migration. Segments of demand may have concise and characteristic mental images of the housing supply which relate to the intra-urban migratory flows of the population. Alternately the methodology offers a means to the study of the formation of mental maps. What are the important aspects of reality which relate to image formation?

3.8.5 HORTON, Frank E., and REYNOLDS, David R. "An Investigation of Individual Action Spaces: A Progress Report," Pr. A. A. G., 1 (1969), 70-75.

The authors propose to investigate the formation of "Action Space" (defined operationally to be the area with which the individual perceives himself to be familiar) by way of a behavioural study utilizing 1965 Origin Destination data for the Cedar Rapids metropolitan area, census areas. Reference to variations in socio-economic character will be considered along with variations in locational attitudes, habitual routes to travel, characteristics of travel and destination and perception of spatial choice (retail) and residential quality. A model defined by a set of simultaneous equations is hoped to be among the final output of this research.

3.8.6 KAISER, Edward J., and WEISS, Shirley F. "Some Components of a Linked Model for the Residential Development Decision Process," Pr. A. A. G., Vol. 1 (1969), 75-79.

The authors present a report on work in progress which deals with a multi-component model of residential structure. The component mobility model estimates intrametropolitan moves in migration plus household formation in order to define demand. Supply is defined by the mobility model (vacated households) and the developer model. A residential choice model gives the linkage between supply and demand segments of the market. Output will include the joint distribution of housing and household characteristics and the location of each in the urban spatial context.

3.8.7 *OSHAWA AREA PLANNING AND DEVELOPMENT STUDY

The study involves the formation of a regional development plan for the Oshawa centred region, designed to meet specified future goals, objectives and criteria. The study involves plans for (1) the physical, social and economic development of the study area, and (2) the structure for the regional government of an, as yet, undefined Oshawa centred region. Numerous models are used in the study.

3.8.8 PETERSON, G.L. "A Model of Preference: Quantitative Analysis of the Perception of the Visual Appearance of Residential Neighbourhoods," J.R.S., 7 (1967), 19-31.

This article presents a quantitative model of subjective personal preference for photos of neighbourhood appearance. The response to 9 variables was analysed using factor analysis, and regression analysis was applied to both the raw data and the factor score output. The author believes that there is a likelihood that "the inhabitants of a census tract, a city or even a nation share so much common culture and physical structure that their perceptions and preferences will be normally distributed...."

3.8.9 STEA, David. "The Measurement of Mental Maps: An Experimental Model for Studying Conceptual Spaces," in Behavioural Problems in Geography: A Symposium, Kevin R. COX, and Reginald G. GOLLEDGE (eds.). Evanston, Illinois: Northwestern University (Department of Geography), 1969. 228-253.

Stea presents a conceptual model of mental map evaluation. Such a 'map on the mind' may not imply 'geography in the head', but might allow the use of effective analogy (i.e.: people might behave as if they possessed a mental map. After the presentation of some empirical examples, the author suggests that the knowledge and understanding of the mental representations of 'physical reality' should be of importance to geographers, planners, and others.)

4.0 PROMINENT CANADIAN MODELERS

The following names represent an incomplete listing of Canadians (or those in Canada) active in the modeling field. Comments have been provided where possible.

ARMSTRONG, Alan.
Executive Officer
Canadian Council on Urban and Regional Research
Ottawa, Ontario

According to Dr. Murdie, Armstrong is one of the most informed (re models) people in Ottawa.

BOURNE, Lang S.
Assistant Director
Centre for Urban and Community Studies
University of Toronto
170 St. George Street
Toronto 181, Ontario

- has extensive experience in urban land use and development modeling
- see ref's 3.2.1, 3.2.2, 3.2.3, 3.2.4, 3.2.5, 3.3.3

CHEVALIER, Michel
c/o Kates, Peat, Marwick & Co.
(see Irwin, N.A.)

- land use modeler
- worked on the Ontario Seminar 1970 with Irwin

IRWIN, Neil A.
c/o Kates, Peat, Marwick & Co.
Prudential Building
4 King Street West
Toronto 1, Ontario
362-2371

- Econometrician
- has extensive experience in the U.S., including the Boston Study
- in charge of the KPM team which organized (and briefed) the Ontario Planning Seminar of 1970 for Senior Municipal Planners, (see Ref. 2.15, 2.13, 3.1.17).

LAROUCHE, Pierre

- Traffic engineer and urban consultant
- developed and applied a simulation model of residential growth in the Montreal region (see ref. 3.1.19).

LUCEY, Jim F.

Senior Project Engineer
Planning Branch
Department of Highways
Downsview, Ontario

- Present project - development of a land use model for City of Hamilton
- other projects - Toronto centred region and Oshawa area
- he and staff have completed a review of the literature and the state-of-the-art in the subject.

MORLEY, David and FOUND, William

Professors
Department of Geography
York University

- have developed a model of land use conversion
- have a research design paper out now in the Joint Seminar Series (on Transportation) of U. of T. and York University.

MURDIE, Robert

York University
Toronto, Ontario

- Ph.D. at U. of Chicago
- social area analysis of Mennonites in the Kitchener-Waterloo area
- taught statistics at the University of Waterloo
- worked with D. Michael Ray on a factor analysis of socio-economic dimensions of Canadian urban development.
- see ref. 3.1.23.

RAY, D. Michael

Department of Geography
Faculty of Social Sciences and Administration
University of New York at Buffalo
Buffalo

- Ph.D. at U. of Chicago - Thesis topic concerned market potential (and urban "shadow") of Southern Ontario
- carried out further market potential study of the same area with Brian J.L. Berry of Chicago.
- has executed and is now executing a factor analysis of the socio-economic dimensions of Canadian urban development (1871-1961) and regionalism for the Department of Energy, Mines & Resources (see James Maxwell of E.M. & R. for further information 992-2422).

SIMMONS, James

Department of Geography
University of Toronto

- land use and land use succession modeler - see ref's 2.19, 2.20.

5.0 PERIODICAL TITLE ABBREVIATIONS

A.A.A.G.	Annals of the Association of American Geographers
A.N.Z.J.S.	Australian and New Zealand Journal of Sociology
An.R.S.	Annals of Regional Science
Apr.J.	Appraisal Journal
Can.Geog.	Canadian Geographer
Geog. An.	Geografiska Annaler
J.A.I.P.	Journal of the American Institute of Planners
J.A.S.A.	Journal of the American Statistical Association
J.M.	Journal of Marketing
J.R.S.	Journal of Regional Science
L.Ec.	Land Economics
M.S.E.S.S.	Manchester School of Economic and Social Studies
P.P.R.S.A.	Papers and Proceedings of the Regional Science Association
Pr.A.A.G.	Proceedings of the Association of American Geographers
Reg. Stud.	Regional Studies
T.P. Rev.	Town Planning Review
T.V.E.S.G.	Tijdscrift voor Economischeen Sociale Geografie
Traf.Q.	Traffic Quarterly
Urb. Stud.	Urban Studies

3. PEOPLE - Elizabeth Hay

This is an alphabetical listing of people, known to the Preliminary Land Study, to be knowledgeable about some aspect of urban land. Their respective addresses, telephone numbers and subject areas are also given. This listing is not claimed to be inclusive, but is a basic compilation of the people working in this field.

NAME	TITLE, ADDRESS, AND TELEPHONE NUMBER	SUBJECT AREA
ADAMS, G.	Head Extension and Field Services Division Department of Municipal Affairs, Ontario 801 Bay Street Toronto 416 - 365-2192	- subdivision procedures - building standards
AKAIN, G.	Secretary, Land Sub-Committee Canadian Council of Resource Ministers 620 Dorchester Blvd. Montreal 514 - 866-8334	- research on land legislation
ARMSTRONG, A.	Executive Officer Canadian Council On Urban and Regional Research Suite 511 151 Slater Street Ottawa 613 - 236-7487	- urban land policy - land assembly
	B	
BAIN, G. K.	Department of Municipal Affairs, Ontario 416 - 365-1497	- official plans and zoning
BARCELO, M.	Senior Planner Service d'aménagement du territoire de la région aeroportuaire, Montreal	- design of bilingual urban information service
BIENHAKER, P.	Transport Planner Kates, Peat, Marwick and Company 4 King Street West Toronto, Ontario 416 - 362-2371	- knows Montreal core
BELANGER, M.	Professor, Department of Geography University of Montreal P. O. Box 628 Montreal 101	- satellite towns
BLAIR, J.	Department of Treasury and Economics Ontario 880 Bay Street Toronto 416 - 365-2773	- regional studies

BLANCHET, P.	General Manager (Real Estate) Canadian National Railway 514 - 877-5420	- Canadian National Railways Property - core re-development
BOLDUC, J. C.	Development Officer Canadian National Realties (see Blanchet)	- Canadian National Railways Property
BOURNE, L. S.	Professor, Department of Geography Centre for Urban and Community Studies University of Toronto	- measuring land use and structural change
BROWNSTONE, M.	Chairman, Research Advisory Committee C.C.U.R.R.	
BRYAN, P. G.	Department of Transport Airports and Field Operations Branch Operations and Land Use Programs 992-5200, 992-9551	- Department of Transport property operations
BRYANT, R. W. G.	Professor, Department of Geography Sir George William University Montreal 879-5995	- land speculation

C

CAMPBELL, Henry C.	Chief Librarian Toronto Public Libraries Toronto	- design of bilingual urban information service
CHEVALIER, Michel	K.P.M., York University University of Montreal	- land use modeler
CHUNG, Joseph	Hautes Etudes Commercial 5255 Avenue des Celles Room 6083, Montreal 250 672-2471 also Low-Income Housing Task Force Central Mortgage and Housing Corporation	- land speculation
COLLIER, Robert	Professor School of Community and Regional Planning University of British Columbia Vancouver 8 228-2493	- public-private interaction

COOPERSTOCK, L. A.	National Capital Commission Long Range Planning Development 995-5167	- land use planning
CORNWALL, Brook	Atlas of Canada Section Survey and Mapping Branch Department of Energy, Mines and Resources 615 Booth Street Ottawa 994-5005	- land use mapping
COULOMBE, G.,	Assistant Deputy Minister of Supply and Service Planning and Finance 123 Slater Street Ottawa 992-1531	- urbanization
CURRIE, Andrew	Deputy Executive Director Metropolitan Corporation of Greater Winnipeg	- urban management
CZAMANSKI, Stanislaw	Institute of Public Affairs Dalhousie University Halifax, Nova Scotia 102 Regency Lane, Ithica, New York 14850	- spatial distribution activities and investments

D

DAVIES, C. M.,	Valuation Co-ordinator Land Valuation Board P. O. Box 1044 Charlottetown, Prince Edward Island 902 - 892-3595	- valuation on land use potential
DOWNING, Jean C.	Supervisor, Research Section Department of Municipal Affairs, Ontario Research and Special Studies 416 - 365-6941	- survey of planning boards
DYKSTRA, T. L.	Office of the Provincial Planning Director Municipal Affairs Building 10363 - 108 Street Edmonton 14 403 - 429-4821	- urban land use study in Alberta

E

ELSON, John	Urban Development Institute 15 Gervais Drive, Suite 806 Don Mills 416 - 825-1165	- land development

ELWOOD, B.	Metropolitan Toronto Planning Board Research Division Toronto	- data bank manual

F

FLECK, James	Executive Director of Special Cabinet Study on Resource Allocation in Ontario	- "Components of Land Development"

G

GERTLER, L. O.	Director, School of Urban and Regional Planning University of Waterloo, Waterloo	- urbanization
GIGUERE, G. L.	Centre de recherche en loisir Université de Quebec Trois Rivières, Quebec	- open space
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