SHAPES OF THINGS TO COME: AN URBAN FORM CASE STUDY
OF THE TORONTO REGION

by
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STATEMENT BY AUTHOR

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## TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>LIST OF ILLUSTRATIONS</td>
<td>vi</td>
</tr>
<tr>
<td>LIST OF TABLES</td>
<td>viii</td>
</tr>
<tr>
<td>ABSTRACT</td>
<td>ix</td>
</tr>
<tr>
<td>CHAPTER</td>
<td></td>
</tr>
<tr>
<td>1. INTRODUCTION</td>
<td>1</td>
</tr>
<tr>
<td>The Nature of Urban Planning</td>
<td>1</td>
</tr>
<tr>
<td>The Plan Process</td>
<td>3</td>
</tr>
<tr>
<td>Planning the Urban Form: Toronto, Shapes of Things to Come</td>
<td>5</td>
</tr>
<tr>
<td>Purpose</td>
<td>6</td>
</tr>
<tr>
<td>Constraints</td>
<td>6</td>
</tr>
<tr>
<td>Procedure</td>
<td>7</td>
</tr>
<tr>
<td>Outline</td>
<td>8</td>
</tr>
<tr>
<td>2. URBAN MORPHOLOGY</td>
<td>11</td>
</tr>
<tr>
<td>Historical Descriptions of the Urban Form</td>
<td>11</td>
</tr>
<tr>
<td>Von Thunen--A Land Use Theory</td>
<td>12</td>
</tr>
<tr>
<td>Christaller--A System of Cities</td>
<td>15</td>
</tr>
<tr>
<td>Urban Structure</td>
<td>18</td>
</tr>
<tr>
<td>Burgess--A Concentric Zone Theory</td>
<td>19</td>
</tr>
<tr>
<td>Hoyt--A Sector Theory</td>
<td>21</td>
</tr>
<tr>
<td>Harris and Ullman--A Multiple Nuclei Theory</td>
<td>23</td>
</tr>
<tr>
<td>Hypothetical Urban Pattern</td>
<td>28</td>
</tr>
<tr>
<td>Summary--The Urban Form and Structure</td>
<td>31</td>
</tr>
<tr>
<td>3. TORONTO: THE CASE STUDY AREA</td>
<td>32</td>
</tr>
<tr>
<td>History</td>
<td>32</td>
</tr>
<tr>
<td>The Region</td>
<td>36</td>
</tr>
<tr>
<td>4. TORONTO: SHAPES OF THINGS TO COME</td>
<td>42</td>
</tr>
<tr>
<td>Toronto's Morphology</td>
<td>42</td>
</tr>
<tr>
<td>Future Urban Forms</td>
<td>56</td>
</tr>
<tr>
<td>Concentrated</td>
<td>57</td>
</tr>
<tr>
<td>Decentralized</td>
<td>58</td>
</tr>
<tr>
<td>Multi-Centered</td>
<td>59</td>
</tr>
<tr>
<td>Summary</td>
<td>71</td>
</tr>
<tr>
<td>5. EVALUATION AND CONCLUSION</td>
<td>...</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>-----</td>
</tr>
<tr>
<td>Planning Strategies</td>
<td></td>
</tr>
<tr>
<td>Implications</td>
<td></td>
</tr>
<tr>
<td>Implementation Constraints</td>
<td></td>
</tr>
<tr>
<td>Urbanism</td>
<td></td>
</tr>
<tr>
<td>Physical Resources</td>
<td></td>
</tr>
<tr>
<td>Circulation</td>
<td></td>
</tr>
<tr>
<td>Social Values</td>
<td></td>
</tr>
<tr>
<td>Selected Urban Form</td>
<td></td>
</tr>
<tr>
<td>Scale of Regional Centers</td>
<td></td>
</tr>
<tr>
<td>Compatibility: Nucleated Hierarchy and Urban Forms</td>
<td></td>
</tr>
<tr>
<td>Technical Modifications</td>
<td></td>
</tr>
<tr>
<td>Conclusion</td>
<td></td>
</tr>
<tr>
<td>SELECTED BIBLIOGRAPHY</td>
<td></td>
</tr>
</tbody>
</table>
# LIST OF ILLUSTRATIONS

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1</td>
<td>The Plan Process</td>
<td>4</td>
</tr>
<tr>
<td>2.1</td>
<td>Location-Rent Function (after Nourse)</td>
<td>14</td>
</tr>
<tr>
<td>2.2</td>
<td>Location-Rent Function and Access (by Von Thunen)</td>
<td>14</td>
</tr>
<tr>
<td>2.3</td>
<td>The Central Place Hierarchy: Developed by Christaller as a Marketing Principle</td>
<td>17</td>
</tr>
<tr>
<td>2.4</td>
<td>The Classical Land Use Pattern Concepts</td>
<td>24</td>
</tr>
<tr>
<td>2.5</td>
<td>Hypothetical Urban Land Use System: Situated on a Waterfront</td>
<td>29</td>
</tr>
<tr>
<td>3.1</td>
<td>Toronto's North American Location and Linkages</td>
<td>35</td>
</tr>
<tr>
<td>3.2</td>
<td>The Toronto Region Major Centers</td>
<td>38</td>
</tr>
<tr>
<td>4.1</td>
<td>Historical Transportation Routes</td>
<td>43</td>
</tr>
<tr>
<td>4.2</td>
<td>Contemporary Inter-City Transportation Corridors</td>
<td>44</td>
</tr>
<tr>
<td>4.3</td>
<td>Toronto Before Public Transit</td>
<td>46</td>
</tr>
<tr>
<td>4.4</td>
<td>Inter-City and Local Public Transit</td>
<td>46</td>
</tr>
<tr>
<td>4.5</td>
<td>Suburban Development and the Automobile</td>
<td>49</td>
</tr>
<tr>
<td>4.6</td>
<td>Suburbia and the Freeway, Arterials, and Rapid Transit</td>
<td>49</td>
</tr>
<tr>
<td>4.7</td>
<td>Existing Boroughs, Freeways, Rapid Transit, and Commuter Rail Patterns</td>
<td>52</td>
</tr>
<tr>
<td>4.8</td>
<td>Adaptation of Theoretical Nucleated Pattern to Toronto</td>
<td>54</td>
</tr>
<tr>
<td>4.9</td>
<td>Radial Urban Form Development</td>
<td>62</td>
</tr>
<tr>
<td>4.10</td>
<td>Corridor Urban Form Development</td>
<td>64</td>
</tr>
<tr>
<td>Figure</td>
<td>Description</td>
<td>Page</td>
</tr>
<tr>
<td>--------</td>
<td>------------------------------------------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>4.11</td>
<td>New Town Urban Form Development (Existing and Virgin Sites)</td>
<td>68</td>
</tr>
<tr>
<td>4.12</td>
<td>Satellite Communities</td>
<td>70</td>
</tr>
<tr>
<td>5.1</td>
<td>Central Place Hierarchy: Scale and Distance of Nodes</td>
<td>87</td>
</tr>
<tr>
<td>5.2</td>
<td>System of Cities: Predicted Regional Location</td>
<td>87</td>
</tr>
<tr>
<td>5.3</td>
<td>The Toronto Region Model Aggregate</td>
<td>89</td>
</tr>
<tr>
<td>5.4</td>
<td>Proposed Urban Form The Toronto Region</td>
<td>96</td>
</tr>
<tr>
<td>Table</td>
<td>Page</td>
<td></td>
</tr>
<tr>
<td>-------</td>
<td>------</td>
<td></td>
</tr>
<tr>
<td>3.1</td>
<td>41</td>
<td></td>
</tr>
<tr>
<td>Population of Toronto: Metropolitan Municipality and CMA</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
ABSTRACT

Metropolitan Toronto and its surrounding region of southern Ontario constitute the most heavily concentrated urbanized area in Canada. The implications of continued growth accentuate the pressing need for a comprehensive regional scale plan. A prerequisite to effectuating the urban planning process is an assessment of the conceptual framework in which a region's urban development pattern can evolve.

In the past, the planning profession has been preoccupied with the urban form without gaining an appreciation for the processes. Although planning the human habitat relates emphatically to man's psychic-self, examination is made of historical, morphological theories and classical urban form models. Equally imperative is consideration of the present urban growth and structure as it has emerged in the case study region. These elements produce the urban pattern and are factors essential to any future urban form concept. The basic assumption being that planners are required, capable of analyzing urban phenomena, and able to articulate viable conceptualizations.

This thesis formulates a concept for the future urbanization of the Toronto Region. It proposes that urbanism be allocated in a nucleated configuration. By employing a hierarchical system of centers arranged in corridors, maximum efficiencies and optimum utility can be made of natural and man-made features in the environment.
CHAPTER 1

INTRODUCTION

The Nature of Urban Planning

Urban planning, as used in the context of this paper, may be perceived as a management function. It deals with the issues of administration as they pertain to our ever changing urban environment. The urban planner is a product of a multi-disciplinary series of studies—a generalist. His expertise is confined to being able to understand, and be understood by, the numerous relevant technical and professional experts (e.g., architects, engineers, and social scientists, etc.). He must also mold these many perspectives into a dialogue with the political representatives (e.g., politicians and civil servants) and layman groups (e.g., citizen organizations and ratepayers associations).

The planner must be equipped with a series of basic management qualities. He must be able to initiate projects and research enterprises; the necessary facts have to be sought and relevant concepts or standards stated. He must act as an information source, to clarify the meaning and understanding of issues. The essential need to develop a cooperative effort by elaborating upon the perspectives of other groups and the orienting of all groups toward common goals must be emphasized. The planner must take the summation of these dialogues and mold them into a plan. He must then continually re-assess the merits of his
plan in terms of the feedback from the citizenry it is intended to serve.

The urban planner does not have the tangible qualities of expertise that are common to many of the constituent disciplines of planning. His tools are the plan, political policy, and project programs. He is expected to interpret philosophies in terms of the community's "goals" and "objectives"—the local societal and cultural traits. This situation has presented the planning profession with an opportunity to emerge as a "specialized," coordinative, urban management discipline.

Planning owns few theoretical or technical models; a preference being given instead to the use of an assortment of available models developed by related disciplines. Nonetheless, many planning research sections are too engrossed in "re-discovering the wheel." All things need not be plan-defined before they are acclaimed as being useful to the planning society. Furthermore, the implementation stage of planning has been ignored too long. It is not unreasonable to presume that some of the most creative plans ever devised are collecting dust in an office because the planner failed to comprehend the realities of implementation.

Thus, a plea is made for the redirectioning of planning research efforts from the innovative school to a reworking of established models, theories, etc., intended to facilitate the requirements of the practicing planner. Consequently, it is a purpose of this paper to use existing theoretical studies, existing plans, and government policy as background. It will then be possible to remold the sum into a workable
program for the future development of the selected case study research area.

A major dichotomy remains in planning regarding the ability of the profession to satisfying the requirements of the people it serves. Solutions must be both technically practical and politically feasible. In other words, while it may be technically possible to propose a variety of schemes which will direct future development, the plan must be acceptable to the people. It is relatively easy, on the one hand, to deduce general policies (i.e., goals such as "to make it a better place in which to live," etc.). But the specific policies on how one achieves this state are not necessarily identifiable. Also, there might be more than one way to obtain the same end results. The implementation of technical solutions must go hand-in-hand with community acceptance. The charting of such a course is a very important function of the planner.

The Plan Process

The Plan Process (Figure 1.1) depicted will not be carried out in its entirety. It is intended to indicate the direction of proceedings necessary to produce a comprehensive and viable urban plan. The incremental items from the inventory and research stages through to the alternative plan proposals will be considered, but only passing reference can be made in areas of political commitments (i.e., specific objectives, priorities, and funding). The residual components, while of paramount importance, cannot be dealt with in such an idealistically oriented paper.
Figure 1.1. The Plan Process
Generally, a plan is a policy and program "designed to secure the health, safety, convenience or welfare of the inhabitants"\(^1\) of the planning area. A series of commonly accepted goals may be stated as follows:

1. To promote through a guiding framework, the development of the community in an orderly and compatible fashion.
2. To produce the best environment in terms of comfort, convenience, and aesthetic quality for working, residing, and leisure activities.
3. To provide an enhanced utilization of public and private land uses to meet the needs of the citizenry.
4. To remove inefficiencies and encourage high functional standards.
5. To reduce congestion and enhance circulation.

Collectively, these goals are abstract commitments to make the community a better place in which to live.

Planning the Urban Form: Toronto, Shapes of Things to Come

The scope of this thesis includes a descriptive analysis of a case study city, its suburbs, urban fringe, and commuting hinterland. Study is made of its urban morphology with special emphasis upon the influences of transportation systems. A variety of urban forms are discussed as possible planning solutions to shape the future of this macro-metropolitan area.

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Purpose

The purpose is to apply the principles of generic planning for a metropolis (i.e., suggest a regional growth concept). The planning is long-range in intent; it is future oriented rather than incremental, pragmatic planning or retrospective adaptations to medicate existing problems. The following outlines a development concept; it is essential to provide such a framework so that political and administratively viable decisions can be made to direct future development throughout the region.

Selected key variables are considered not so much for their individual impacts, but on the aggregate effect that the constituent elements will have upon shaping the future urban form. Generally, the following components are of critical importance to the directioning of future growth and development:

1. Urbanism--growth and community resource allocation.
2. Physical resources--human and biological site features and local physiography.
4. Political management--provincial, regional, metropolitan, and municipal (planning being interpreted as a political device).

Constraints

The most obvious constraint to such a concept is the unknown. We do not know what the future holds; yet decisions must be made and today's commitments regarding human settlement desires and needs,
domestic wants and policies, are shaping tomorrow's urban form. But, planning goals and objectives set to meet existing conditions may readily become obsolete (e.g., the "expressway era" has been replaced by an outcry to "make the city for the people").

It is assumed the urban form of the future would be a product of free market choices (e.g., economic man's desire to maximize profits) and bureaucratic restraints (e.g., political determinism). Furthermore, because of the regional analysis nature of this paper, no attempt should be made to develop specific project schedules. In other words, the focus is upon planning as a dynamic enterprise to effectuate a balanced equilibrium for future urban evolution.

Procedure

Academic research may be defined as the organized search for a contribution to knowledge. Among the array of possible means by which this end can be achieved are:

1. For a descriptive picture of how planning decisions made for another era have been passed on to today's city see the work of Lewis Mumford, *The City in History: Its Origins, Its Transformations, and Its Prospects* (New York: Harcourt, Brace & World, 1961).

2. This was a basic theme for the "reform" politicians during the municipal election campaign prior to the December 4, 1972 vote. Return of the "reform" candidates to municipal council seats by the election would seem to confirm the citizen's accord with the belief that development must be controlled; development for the sake of development is no longer accepted as valid reason to rape the city of its neighborhoods and history.

3. The basis for these statements rests with the philosophy that an idea is nothing until it has found expression (and application). For the complete methodological dialogue which this paper attempts to abide see Abraham Kaplan, *The Conduct of Inquiry* (San Francisco: Chandler, 1964). Also see R. J. Chorley and P. Haggett, "Models, Paradigms, and the New Geography," in *Models in Geography* (London: Methuen, 1967), Chapter 1.
1. The restating of established theories, or placing theories in a contemporary frame of reference.

2. The application of established theories in a new location.

An effort is made to draw upon data and materials produced by a variety of related disciplines. No attempt is made to develop new planning tools or means, hypotheses or models, but to incorporate long standing theories on urban morphology at many scales; the reintroduction of a synthesis of these models will aid the predictions for the future urban pattern in a different frame of reference and case study area.

Thus, the procedure is to monitor selected physical (and environmental), economic, and social (and political) variables as the urban area evolves. These are developed into trend patterns for the case study area and the controls of the established theories being tested. The end product is a policy-decision framework for the alternative forms of urban development.

Outline

Prior to proposing a plan for the future urban pattern, it is essential to gain an understanding of the present land uses and the major contributing factors to the existing arrangement. The present urban configuration can be described in terms of the historical concepts on Urban Form and Urban Structure. These theories can then be restated into a hypothetical urban pattern for future development that is dynamic, responsive, and resourceful.
The scale of inquiry used in the development of the established theories selected is not consistent. The purpose of such a feature is to reflect the repetitive nature of the nucleated patterns of settlement at a series of different scales; accessibility is, however, consistent as the linkage component. With these theories aggregated into a composite, a hypothetical city form with micro and macro scale arrangements can be devised.

A case study application is required to test the validity of the empirical studies described in a new frame of reference. The Toronto urban area, in addition to being a major center in North America, satisfies certain essential characteristics necessary for the proposed analysis:¹

1. A macro metropolitan urban area experiencing growth.
3. A political awareness at the Provincial, regional, and municipal level that has produced sets of goals and objectives.
4. The other constituent elements noted above.

A conceptual plan for the future form of the urban case study area is developed. A corollary is an evaluation of the effect this conceptualization will have upon selected key variables. In addition, the implementation of the proposed regional concept must be tempered by consideration of the intangible nature of social values and their

¹. The case study area is of particular interest to the author because of his experience and familiarity with the Toronto urban complex.
associated implications upon the political process and final level of decision making.
CHAPTER 2

URBAN MORPHOLOGY

A study which attempts to analyze urban form must devote due attention to historical antecedents. Insomuch as these are not considered for the specific results produced, the groundwork efforts to generalize urban order into readily discernible categories of classification are of practical methodological value. Particular observation can be placed on the consistency with which the same fundamental type-classifications are regularly repeated albeit the descriptive circumstances may be substantially different.

Historical Descriptions of the Urban Form

This chapter considers the conceptual history of urban structure. The descriptive theories developed to explain the agricultural uses about a central market place and the relationships between a market place and a series of other market places are discussed. The descriptive theories used to analyze the existing patterns of land use about the central business district are reviewed to give a complementary perspective of settlement patterns in the urban setting. These concepts have a place in urban planning methodology today for they provide the basis upon which a hypothetical, nucleated urban structure can be composed.
Von Thunen—A Land Use Theory

The agricultural descriptions of the nineteenth century can be restated to describe some elements of the urban pattern. Von Thunen, an economist-minded estate farmer, developed in 1826 a process for identifying zones of agricultural production by employing a static method model. He assumed that there was a complete availability of information, that individuals were prepared to change the land use system, and that a completely rational economic behavior prevailed. To these presumptions he applied the economic laws of price structure for agrarian produce and then translated the price fluctuations into a series of identifiable rings for production.

The principal conditions for the Von Thunen isolated state were: a homogeneous plain consisting of one central city and its hinterland (i.e., no external trade linkages), uniformity in the land (capable of producing mid-latitude crops), the horse and wagon transportation modes, and the costs of transportation in direct proportion to the distance.

An elaboration upon this concept of economic rent and its influence upon shaping the land use can be shown diagramatically. Generally, the gradient is dictated by the factor of transportation—the cost to move a unit of produce per mile—and the yield potential per unit of land. The land use (crop) represented by the slope xz (e.g., a market garden product such as potatoes) has a possible land use


potential through to z. However, at the point y the crop uw (e.g., wheat) becomes the optimum crop. But this crop is also open to the influences of intervening opportunities at point v where a third crop (e.g., grazing hay) becomes the maximum profit/minimum cost product m2m3.

When portrayed on a land surface about the market place, M, the land use pattern of concentric zones emerges as in Figure 2.1. The ring system of agricultural products about a central city can be transposed into a cityscape analogy (see Burgess—A Concentric Zone Theory, this chapter). The inner limits of a land use is due to more lucrative alternatives and the outer limits are designed by transportation costs which result in declining profits.

Von Thunen's land use system is static for one point in time; any change will have an immediate series of associated changes. Thus, the effects of a navigable river on the model, by providing an alternative mode of transport which is usually cheaper, have skewed the results along the river routes (see Figure 2.21). Von Thunen also recognized the impact of trade restrictions, subsidies, and taxes.

There is an analogy between the work of Von Thunen in agriculture and the findings of Losch, Weber, and Hoover with regards to industrial land uses; all results created "zones" or "rings" of land uses based upon the summation of individual entrepreneurs regarding their individual firms rent and locational choice. Furthermore, the

1. After Chisholm, Rural Settlement and Land Use, p. 29,
Figure 2.1. Location-Rent Function (after Nourse)

A = cost (rent)
B = distance
M = market
xz = rent bid market garden
uw = rent bid wheat
sm3 = rent bid grazing hay

central city
for the isolated state
surrounded by zones of
agricultural production

A. the Isolated State
B. the Modified Conditions

navigable river

a small city
with its own
production node

Figure 2.2. Location-Rent Function and Access (by Von Thunen)
consequence of a more sophisticated mode of transport overcoming the friction of distance is acknowledged in these frameworks.

Christaller—A System of Cities

To gain an understanding of urban morphology, it is essential that the partial models, which consider specific sets of activities, be united with the comprehensive models, which are composed of systems of activities and their interactions.

In the course of applying modified situations to the ring theory, Von Thunen, according to Chisholm, "... opens up the possibility of numerous towns of roughly equal importance with production zones which mingle and mutually modify each other." Christaller, a geographer, postulated a systematic organization for centers where services were intrinsically unified.

Christaller's concept re-employs the assumption of an equal terrain (i.e., no inhibiting physical features) and identical consumers distributed uniformly with freedom to move in any direction; resource oriented centers were eliminated so that no site would have a primary advantage for any particular product (e.g., a mine). With these theoretical parameters, the resultant settlement pattern over the homogeneous plain portrayed a hierarchy of trade centers. The concept formulated described the arrangement, size, and characteristics of a series of service activity nodes.

1. Ibid., p. 32.

These centers were regimented into frequencies whereby the smaller centers were of greater numeric occurrence (i.e., the centers which provided goods of a bulk, convenience, or perishable nature were found most often). The hierarchy scale passed through intervening levels of increasing complexity in goods offered culminating in a major regional center that provided a great deal in specialty items in addition to all the goods provided by each of the subservient centers (i.e., a metropolitan complex).

In other words, the city functions as the "central place" for goods (including services) for its hinterland. The city, being of the highest order, will be located at an approximation to the mid-point of the tributary area (i.e., the point of least aggregate travel). The level in the hierarchy precipitates from its total of provided facilities. The higher order centers are surrounded by a belt of the next lower order places. The interconnections and dependencies of the consumer and market place are critical to the central place concept (see Figure 2.3).1

Berry2 in analyzing the work of Christaller and other classical central-place theorists varied the system of cities concept to adequately describe the market area and centers for retail shopping:

- regional capital
- regional center (or CBD)
- city
- community center
- town
- neighborhood center

1. Ibid., p. 65.
2. Ibid., Chapter 2.
Figure 2.3. The Central-Place Hierarchy: Developed by Christaller as a Marketing Principle
The rural-city dichotomy reflects economically rational man's desire to obtain minimum travel costs for his multi-purpose trips, encouraging agglomeration tendencies that form central clusters. Berry was able to introduce two new aspects which further clarified the theory:

1. Range—the trade area of a particular function.
2. Threshold—the purchasing power necessary to support the good/service from a central place.

The efforts of Von Thunen and Christaller clearly illustrate the possibility for, and usefulness of, developing an explanatory model of land use arrangements—a vital constituent of urban morphological studies. The intent of their philosophies makes the theories applicable to both rural and city analyses and are equally apt for a divergency in scales. Von Thunen's descriptions covered the spectrum from the individual farm to the hinterland of a city; Christaller described the hierarchy ordering of city systems and his work has been reinterpreted to explain the arrangement of urban retail distribution clusters.

Urban Structure

The foundations upon which urban structural concepts are built rests primarily on the pioneering works of three sets of urbanologists: Burgess, Hoyt, and the combined team of Harris and Ullman. The land use models devised were based on the premise that although each urban

1. Ibid., p. 15.
center would have its particularly unique features, nonetheless, there was an order to the overall framework of the land uses. These efforts were an adaptation to the city of the ideals for urban systems established by Von Thunen (land use patterns) and Christaller (central-place patterns).

Burgess--A Concentric Zone Theory

Burgess' work was a result of his in-depth observations of the City of Chicago and produced what can be termed the "Concentric Zone Model." This classical theory takes into account:

1. The characteristics of the inhabitants (e.g., factors such as age, religion, income, etc.).
2. The charting of changes over time in relation to changes in the population composition and land uses.
3. The characteristics of the population based on land use.

Since the author was a sociologist, he was more intent upon explaining the people arrangement rather than proposing reasons for the land use pattern. But this does not distract from the value his studies played in urban evolutionary theory. Unfortunately, Burgess did ignore the influences of factors which would distort the ring model such as topographic irregularities and the impact of circulation corridors.


2. For more information on the influences of social values and behavior upon shaping the urban form by considering topography and circulation facilities, attention should be given to the work on Boston by Walter Fiery, Man, Mind, and Land (Glencoe: Free Press, 1960).
The Concentric Rings depict five general zones coincident with the location-rent function offered in Figure 2.1:

1. Ring 1, the CBD--This is the area of the city with the most intensive land uses, the central business district. The CBD has a number of functional groupings, such as retail shopping, financial, entertainment, major hotel, and office buildings; some CBD zones also contain the civic administration buildings. It is the place of transient populations who are either staying in the hotels or arrive from the "commuter shed."

2. Ring 2, the Zone of Transition--This ring historically was the first of permanent settlement. Now the land is held by speculators who rent out premises for transitional high yield returns (e.g., light manufacturing, marginal businesses, rooming houses, bawdyhouses, and taverns). Burgess noted a high rate of delinquencies and social deterioration associated with the area.

3. Ring 3, the Worker's Housing and Factory Zone--This zone contains the relatively small housing structures inhabited by the lower-classes. The occupants' employment needs were met at the local districts factories.

4. Ring 4, the Residential Zone of High-class Apartments and Single-family Dwellings (Middle-class)--This can be associated as the residential district of the white-collar professionals. The dwelling style is typified by home ownership or apartment residences.
5. Ring 5, the Commuter Zone (Suburbs and Satellites)—Primarily a dormitory district with the CBD providing the employment, shopping, and other service facilities.

Contemporary urban theorists accept the work for its prototype significance, discounting its simplicity, and have supplemented it with their own inductive reasoning. Berry and Garrison suggest a substitute whereby the rent dimension of Burgess is replaced by transportation costs. Similarly, Garner has stated: "Accessibility is assumed to decrease uniformly in all directions from the city center, and by implication the rent that an activity is prepared to pay for a site use decreases from the central point." Such modifications have added significance to the Burgess Concentric Zone Theory and increased its value as a simplistic model.

Hoyt—A Sector Theory

Hoyt, a land economist, authored the Sector Model. His work dwelled upon the pattern of growth in high-rent districts and the pattern of these movements produced the modified urban ring model. In


3. Homer Hoyt, The Structure and Growth of Residential Neighborhoods in American Cities (Washington: Federal Housing Administration, 1939), Chapter IV.
accordance with the invasion-succession concept of outward migration, movement is supposed to go from an inner zone to the next outer ring. Hoyt noted that the higher income groups were not uniformly dispersed rather they were at liberty to select and build on a site anywhere.

After detailed analysis, definite paths of growth for high-grade residential uses were documented:

1. Along established lines of transit.
2. Progress toward high ground.
3. Toward free and open space.
4. Toward the homes of community leaders.
5. The CBD would pull higher-priced residential.
6. Development along the fastest existing transport lines.
7. Along the previous lines of high-grade growth.
8. Delux high-rent apartments near the business centers.
9. Real estate promoters may bend the direction of growth.

More recently, the effects of controlled development by the powers of zoning may have been added to the above list.

Thus, Hoyt prescribed sectors, not rings, of land use as the pattern most adapted to describe the internal structure of cities. The development of new residences by the city's high-rent groups would generally start a trend in that area of similar character and radiate

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1. Biological terminology has been adapted by urban ecologists to help explain urban evolution. Generally, invasion is the expansion of one type of group into another area. Succession is the situation which precedes invasion whereby established groups withdraw to another area. For an elaboration on this concept see Robert Dickinson, City and Region: A Geographical Interpretation (London: Routledge & Kegan Paul Ltd., 1964), pp. 47-48.
outward from the city core in the preferred direction. The lower ranking groups would then follow by moving into the preceding groups' vacated residential holdings.

While the results were based principally in the field of high-rent residential growth paths, Hoyt's theory is of considerable value to this study as the dimensions of distance and direction from the city center were discussed as critical factors.

Harris and Ullman—A Multiple Nuclei Theory

The third classical theory proposed to describe an order to the internal structure of the city came from two geographers, Harris and Ullman.¹ They had studied the nature of cities and developed a complementary concept for the two previous theories—the multiple nuclei arrangement (see Figure 2.4).² The actual number of nuclei was dependent upon the specific historical development, size, and city structure.

In light of the fact Harris and Ullman were focusing on city structure, they were able to incorporate a number of concepts as factors affecting the overall city composition:

1. Specialized requirements for some functions (e.g., retailing is closely dependent upon high levels of accessibility).

² Ibid., p. 11.
Concentric Zone Concept
1. CBD
2. zone of transition
3. zone of workingmen's homes
4. zone of better residences
5. commuters' zone
(by Burgess)

Sector Concept
1. CBD
2. wholesale light manufacturing
3. low-class residential
4. medium-class residential
5. high-class residential
(by Hoyt)

Multiple Nuclei Concept
1.-5. (see Sector Concept)
6. heavy manufacturing
7. outlying business districts
8. residential suburbs
9. industrial suburbs
(by Harris and Ullman)

Figure 2.4. The Classical Land Use Pattern Concepts
2. Agglomeration economies (e.g., the grouping tendency of certain activities such as financial institutions).

3. Segregation trends (e.g., the disassociation of heavy industry and high-class residences).

4. Economic threshold (e.g., the inability of some functions to afford the high rent districts).

The foregoing criteria was then applied to identify the following city districts:

1. The CBD—This is the major nuclei and focus of the transportation facilities.

2. Wholesale and light manufacturing—Location of these industries was dependent upon inter-city transportation facilities.

3. Heavy industry—This district was usually located on the fringe of the former city limits.

4. Residential neighborhoods—Various levels of residences were located in the city in a fashion described by Hoyt.

5. Minor nuclei—A sub-nuclei would develop around a major function (e.g., a university, industrial center, or outlying business district) but was subordinate to the CBD.

6. Suburbs and satellite towns—These are principally dormitory in nature and have arisen with the widespread use of the automobile.

Of significance, the multiple nuclei concept had considered other factors to be equally responsible for structuring the urban form rather than relying exclusively on the land-rent function. In
particular, the transportation aspect which had distorted the concentric zone theory was expanded. Similarly, individual industries and their special considerations, agglomeration economies, and the disassociation of some activities were taken into account.

Ullman\(^1\) reconsidered his original theory in light of the post World War II era of the automobile and suburbanization. He gave added emphasis to the Multiple Nuclei Theory citing examples of situations where the centrifugal pattern prevailed in urban areas:

1. Outlying shopping centers would handle retail trade by bringing the shopping to the customers.
2. Large factories and employment centers would be located on large tracts of land near the outskirts.
3. Specialized entertainment, educational, cultural, and recreational centers would be scattered all over the city to serve the whole populous.

He credits the ability to decentralize on improvements in the circulation systems and communication networks; the objective had been to reduce congestion and total travel time.

In many cases the CBD had lost its paramount position because the reasons for its existence had dissipated; it would remain strongest in urban areas where historical traditions combined with the need for face-to-face contact (e.g., financial business transactions). The cause of the central area decline apparently rests with the migration of the

people to the suburbs. All the essential services formerly offered exclusively in the central core were available in suburbia also.

The affluences of suburban living held appeal to city dwellers with the opportunity to own a house (and a yard) and the increased vehicle of mobility, a car (or two or three). Efforts were expended on improving the quality of schooling and a sense of security from core city crime. But the population was not alone in desiring to obtain the merits of suburbia. Manufacturing concerns and warehouses sought to capitalize on the spaciousness and single story plant layouts available in the suburbs. The ample space for parking cars and the proximity to the relocated suburban labor force were other benefits gained.

These urbanologists have provided a descriptive analysis of the urban areas about them. Obviously, it would be impossible, and probably undesirable, to encourage the development of future processes in the manner of history with the very limited physical (spatial), economic, and social forms. Development and growth are now seen from a new perspective where a challenge has been presented to the old philosophy of the benefits of continuous growth and resource exploitation (e.g., growth for growth sake is no longer a valid reason for an urban area to continue expanding; emphasis has been shifted to the quality of life).

However, the utilization of these simplistic models can provide the basis of what can happen if a set of principles are followed. For instance, the efficiencies of the central-place concept, economies of scale and agglomeration linkages, can reduce redundancy and avoid
excessive waste of resources. A series of corridors and nodes can be planned, at varying scales throughout the urbanized core and metropolitan region, for the proper (i.e., in accord with the community's goals and objectives) allocation of resources and activities. Thus, planning being political can act as an instrument to coordinate policies and implement programs for the decision-makers.

**Hypothetical Urban Pattern**

While the foregoing discusses the "classical" explanations for the spatial organization of an urban area, each theory is not necessarily assumed to represent a mutually exclusive experience. Each describes a priori situations in a schematic conceptualization and, when analyzing the real world, one can expect to find variations of all the "classical" models (see Figure 2.5).

A hypothetical city model can be predicted utilizing the established theories on urban structure and form. Suppose the hypothetical city is on a waterfront (i.e., growth is restricted in one direction) and has four major nuclei. From the work of Von Thunen, a higher rent will be asked and received as one locates nearer the nucleus. This pattern will also be dramatically skewed along transportation routes that provide the easiest access to the central business (market) place.

Christaller provided a system into which the four nuclei can be arranged. Each of these major nuclei will have a hinterland about them to which they provide the highest level of goods and services. However, there is also the possibility of one center being a part of a still higher order hierarchy (i.e., in addition to providing the facilities,
A paramount node
B, C, D, satellite nodes of A
• sub-nodes of the satellite B
– transportation corridors

Note: each node will have a series of concentric rings, sectors, and/or multiple nuclei system(s).

Figure 2.5. Hypothetical Urban Land Use System: Situated on a Waterfront
etc. of the other three nodes). The remaining nodes look to this paramount center for certain matters of a specialized nature. The virtue of belonging to a higher order of urban complexes may be due to historical tradition, locational advantage, or any one of a multiplicity of possibilities. Presume that center "A" is the paramount focus to this urban mix.

Burgess developed the general land use pattern to be found about any one of the centers. His concentric rings described the central core area as the CBD and in descending order from the core of commercial dominance: the zone of manufacturing, a spectrum of residential groupings, and suburbia.

The schematic representation will have been modified by Hoyt's contribution of the dominance and attraction of certain sectors. For a variety of reasons, primarily related to the human element, each of the four centers will hold a degree of attention for specific groups and add a new dimension to the hypothetical arrangement.

The incorporation of Harris and Ullman's multiple nuclei concept molds the four center diagrammatic situation into a singular complex. Accessibility is acknowledged as a major influence in determining the urban pattern of today; particularly, the automobile opened up the range of locational choices and thereby replaced "situation" qualities in a location with "site" qualities (e.g., the single-family suburban dwelling).

Thus, the urban form is a total system; each incremental component has an interaction with every other part. The pattern is a
synthesis of man's reaction with his economic aspirations, cultural desires and decisions.

Summary--The Urban Form and Structure

The major result of the historical background presented is the progressive evolution of a systematic pattern of urban structure. It is significant to note the continually occurring statements on the effects of accessibility upon the settlement form. City growth occurs at different rates depending on the distance from the city center and the proximity of transportation facilities. Development will come at a slower rate to the interstitial zones between transportation links. Similarly, the central place hierarchy is able to describe at the macro-level land use arrangements and transportation corridors.

Prior to making policy commitments in a region with many overlapping political jurisdictions, it is essential to gain a consensus at the intergovernmental affairs level on the urban form. The ability to achieve such an understanding can be enhanced by utilizing existing planning models to adequately predict possible future impacts and effects of specific programs. Urban morphology, as discussed in this chapter, can be employed as a valuable research technique to foretell such land use patterns.
CHAPTER 3

TORONTO: THE CASE STUDY AREA

The idealism of the preceding models must be applied to the practicalism of a case study situation. Each urban area has its own geographical uniqueness as opposed to the universality of hypothetical concepts. The blending of research theories (abstract) with a case study urban area (tangible) will provide an indication of the real possibilities for incorporating urban morphological studies into planning policy and programs.

Toronto is suitable for the case study area because of the wealth of information and data already compiled. This is in keeping with the philosophy of the planner as a coordinator, not innovator, which makes the utilization of existing information practical. Thus, the utilization of existing knowledge will provide the research facts for the establishment of trends in the case study area in addition to the theoretical background.

This chapter is sub-divided into two sections. The first part presents the history of the case study region from its colonial beginnings to today's metropolis. Secondly, an analysis of the micro- and macro-study area is undertaken.

History

Toronto, an Indian word meaning meeting place, was originally established by the white man as a trading post. Later it became the
site of a military establishment known as Fort York. Situated on the north shore of Lake Ontario, the location was ideal for the development of a distribution and transshipment center. Of particular significance was Toronto's position at the gateway of the Toronto Passage, the portage route short-cut from the lower to the upper Great Lakes, and its excellent harbor.

The community gained prominence when the government of the day, led by Lieutenant-Governor Simcoe, selected York as the seat of government for Upper Canada in 1793. As a provincial capital, it was necessarily linked to the other parts of the province by a network of roads. Furthermore, the capital attracted professional and mercantile class people in addition to the United Empire Loyalists, from the United States, and immigrant European families looking for a new way of life.

Initially it was the rich hinterland of furs which dominated the town's commercial activities. However, the continuous influx of people gave rise to an expansion in local retailing and stimulated the development of specialized industries to serve the town and its surrounding territory. Thus, by the time the town was formally incorporated as the City of Toronto in 1834, the roots of manufacturing and commercial enterprise had been established.

During the railway boom of the 1880's, Toronto was the distribution hub for exploration and extraction for the mining activity to the north in addition to financial underwriting of the speculative development. The City also became the jumping-off point for people and goods heading for Canada West. The sponsoring of such endeavors prompted the emergence of a stock exchange which primarily specialized in mine
financing. A further effect was the development of manufacturing as the single largest source of employment in the City as raw materials from the north and west were transported to Toronto for processing and shipment to the world markets.

Geographically at the heart of the Great Lakes-St. Lawrence Megalopolis (see Figure 3.1), Toronto has benefited in many ways from its strategic position. In this day of multi-national corporations, the importance of proximity to markets and suppliers in the United States in addition to domestic Canadian sources has been a tremendous bonus for the region. Consequently, it is not surprising to find the major modes of transportation have a confluence of their networks in Toronto. These links, international and regional in scale, have enhanced the provincial capital as a distribution center.

Today, Toronto's labor force is predominantly engaged in tertiary activities as the role of a provider of goods and services continues to increase. Financing with its related institutions (e.g., chartered banks, stock brokers, and the stock exchange) remains significant providing leadership for not only the City but the nation. Toronto has proven to be a conducive setting for the head offices of many a Canadian corporation. The Toronto Stock Exchange has matured to record approximately two-thirds of the total stock transactions in Canada.

Figure 3.1. Toronto's North American Location and Linkages
Twentieth century electronic communications media have aided Toronto in becoming a communications and cultural center for Canada. The anchor stations and facilities for the two major English-Canadian television networks are in Toronto. The City is a thriving community for the performing arts. With half a dozen community colleges and two major universities (i.e., the University of Toronto and York University) the area is well endowed with an academic community and additional research facilities of a sophisticated nature.

The Region

Toronto is the center of activity for not only southern Ontario but, in many ways, the nation and beyond. However, in order to obtain the objectives of a case study analysis, it is necessary to delimit a region of study. Obviously, a consideration of the vast hinterland of this national metropolis would not be conducive for the purposes of urban planning.

In planning a concern is expressed for social and economic factors of urbanism, nonetheless it is the physical plant that is the key working element. As a result, no one single theoretical rationale for a region can be universally devised. The preference has been to leave the limits of a region flexible in order to satisfy the specific needs behind its creation.  

1. The regional concept is considered from a variety of perspectives which emphasize the need for flexibility; Maynard Hufschmidt (ed.), Regional Planning: Challenge and Prospects (New York: Praeger, 1969).
Amongst the various definitions currently used to describe the metropolitan area of Toronto, the following represent the most widely accepted viable choices (see Figure 3.2):

1. The municipal boundary or city limits.
2. The Metropolitan Toronto Planning Area.
3. The Province of Ontario's Toronto-Centred Region. ¹
4. The Federal Census Metropolitan Area.

Municipal boundaries are set by provincial legislation. In 1953, the City of Toronto and twelve of its suburbs were united to form the first regional government in North America, The Municipality of Metropolitan Toronto.² Yet this area of 241 square miles has over the past two decades come to include only the fully developed urban core. Such a definition cannot be used for purposes of defining the Toronto Region because it omits the rapidly expanding suburban fringe areas to the west, north, and east.

The Metropolitan Toronto Planning Area ³ was created to delimit the planning region for the urban core of Toronto (i.e., The

1. Originally conceived as the Metropolitan Toronto and Region Transportation Study the study area was considerably expanded to cover neighboring urban concentrations.


3. The Metropolitan Toronto Planning Area was defined by the Metropolitan Toronto Planning Board for its proposed Official Plan, in December 1965. Subsequently, it was adopted by the Metro Council "not as an 'official plan' within the meaning of 'The Planning Act' (Ontario) but, instead, as a statement of the policy of the Metropolitan
Figure 3.2. The Toronto Region Major Centers
Municipality of Metropolitan Toronto) and the urbanizing fringe municipalities. Covering 720 square miles, the area is basically intended as a zone of study for development and growth regulation. Its scope involves the examination of traditional land use activities (e.g., industrial, commercial, residential, agricultural, recreational, and transportation and communications) and the provision of trunk scale physical services (e.g., water supply and sewage disposal). Established by the constituent municipalities, it was an attempt to provide the framework for regional planning through coordination of the various constituent local municipal plans of the urbanizing core.

The Toronto-Centred Region\(^1\) is the area outlined by the Province of Ontario for its regional development purposes. The region rims the north shore of Lake Ontario extending from Hamilton to Kitchener-Waterloo in the south and west to Midland and Peterborough in the north and east. In essence, the Toronto-Centred Region provides the limits for a regional design for development to achieve provincial balance. The principal objective of the regional plan is to facilitate a decentralization of Toronto's growth and associated agglomeration or centripetal pull. In the attempt to obtain such a broadly based scope, the region delineated includes a large part of the urban hinterland of south-central Ontario.

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Corporation for the planning of future development in the Metropolitan Planning Area"—as stated by the Metropolitan Toronto Planning Board, The Metropolitan Plan for the Metropolitan Planning Area (Toronto: the Board, December, 1966).

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The fourth definition to be considered is the Census Metropolitan Area as devised for the 1971 Census of Canada. This region closely approximates that of the Metropolitan Toronto Planning Area. It is defined in terms of "the main labour market area approach, (and) would be composed of all those rural municipalities, plus enclosed urban municipalities, for which some specified proportion of resident workers commute to the closest urbanized core exceeding 100,000 in population (see Table 3.1). More specifically, the urban core refers to the continuously built-up area covered by a street pattern design and meeting a density criteria of 1,000 persons per square mile; the fringe consists of the immediate zone of influence for a multi-municipal urban center with urban and rural parts. The concept is simple for administrative ends as it is based on only one variable (i.e., commuter access). On the other hand, this definition eliminates the intrinsic role of satellite centers.

The region selected for purposes of this paper must include provision for all the features considered in the above definitions in order to be adequate for regional planning. Thus, the Toronto case study region will approximate that of the Province of Ontario's Toronto-Centred Region as a matter of convenience.

2. Ibid., p. 10.
Table 3.1. Population of Toronto: Metropolitan Municipality and CMA

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<tr>
<th>Area</th>
<th>1966</th>
<th>1971</th>
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</thead>
<tbody>
<tr>
<td>Municipality of Metropolitan Toronto</td>
<td>1,881,691</td>
<td>2,086,017</td>
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<tr>
<td>Toronto Census Metropolitan Area</td>
<td>2,289,900</td>
<td>2,628,043</td>
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Urbanized Core by Municipality

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<tr>
<th>Municipality</th>
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<th>1971</th>
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<tbody>
<tr>
<td>Toronto, City of</td>
<td>697,442</td>
<td>712,786</td>
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<td>Etobicoke, Borough of</td>
<td>265,187</td>
<td>282,686</td>
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<td>Scarborough, Borough of</td>
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<td>York, Borough of</td>
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<td>East York, Borough of</td>
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<td>North York, Borough of</td>
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<td>Richmond Hill, Town of</td>
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<td>Vaughan, Town of</td>
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<td><strong>Total Urbanized Core</strong></td>
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Fringe

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<td>Urban part</td>
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<td>Rural part</td>
<td>37,853</td>
<td>45,140</td>
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<td><strong>Total Fringe</strong></td>
<td><strong>215,376</strong></td>
<td><strong>268,129</strong></td>
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CHAPTER 4

TORONTO: SHAPES OF THINGS TO COME

The chapter presents the evolved situation as it exists in the case study region. The relationship of these trend patterns to the "classical" urban structure and form are developed. The mix of existing theory and existing trends are projected into a series of alternative possibilities regarding the urban form of the future.

Toronto's Morphology

Historical repetition can be found in the directioning of major transportation corridors between other urban nodes and Toronto. As the Toronto region became settled, cordory roads were cleared from the virgin forest lands thereby providing Toronto with essential transportation and communication links. Access was important particularly to the established communities of Dundas and Niagara to the south and Kingston to the east. A third major link was a roadway paralleling the direction of the Toronto-Passage canoe route to the north (Yonge Street).

During the railway building era of the mid 1850's, many communities, including those above, were connected to the capital city (see Figure 4.1). As highway transport became a proven mode of transshipment, many of the traditional transportation corridors were again

Figure 4.1. Historical Transportation Routes
utilized for inter-city highways. Today's generation of highways, the provincial freeways, use as the backbone of their network the original radials corridors to Niagara, Kingston, and the north (the Toronto-Passage route). Thus, time has only changed the vehicular mode and purpose of destination points; the corridor links between nodes have remained essentially constant (see Figure 4.2).

Figure 4.2. Contemporary Inter-City Transportation Corridors
At the micro level a similar node-corridor arrangement can be discerned. While the urban form of Toronto has changed since its inception as a city, such tendencies compare positively with the "classical" urban theories; a discussion of the city's morphology will illustrate the parallel descriptions.

The city, in its early days before public transportation, had an arrangement whereby the affluent citizens resided in central locations (Figure 4.3). The remaining inhabitants resided in more outwardly rings or on the premises of their place of work. This was mainly due to the importance given to access and proximity to the central core.

Inter-city railway lines had a profound effect on the micro as well as the macro accessibility patterns (Figure 4.4). Railway stations in outlying towns such as Mimico and Weston soon stimulated the development of new upper class residential nodes. Developments of this nature reinforced the links between the fringe communities, now used by some as commuting dormitories, and the central city.

The emergence of public urban transportation facilitated an opportunity for the middle class to construct residential rings and nodes beyond the city limits and the lower class domiciles (e.g., Brockton and Parkdale). The initial public transit service in Toronto was a horse-drawn omnibus. The route ran from the city hall and market place along the heavily travelled Yonge Street to the neighboring Village of Yorkville. Later, popular usage and advancing

Figure 4.3. Toronto Before Public Transit

1. CBD
2. high-class residential
3. low-class residential

Figure 4.4. Inter-City and Local Public Transit

1. CBD
2. high-class residential
3. low-class residential
4. middle-class residential suburbs
technology saw this route and others converted to the horse-drawn street car.

By the turn of the century, Toronto was clearly compatible with the descriptions given for the concentric and sector land use theories. At about this time, the automobile was becoming an accepted element of society and, in turn, made its own demands upon the cityscape giving credibility to the multiple nuclei concept. The adaptations to the urban form have made it possible to observe aspects of all three "classical" models in the case study region.

The car provided a means from which added flexibility was fostered with regards to residential location patterns. The twofold experience of urban-rural living which evolved has been labeled suburbia. However, it was necessary for these suburbanites to have ready access to the central city's (Toronto's) commercial and financial districts, etc. As a consequence, a system of arterial road networks was developed to enhance circulation. These arterial roadways served coincidentally as corridors for mass transit facilities. For instance, the advent of the electric street car in the 1890's provided a predominant link between the City of Toronto and outlying towns such as Richmond Hill to the north. Typical street car suburbs developed like North Toronto and New Toronto; such communities were dormitory satellites of Toronto.

During this period high class residential neighborhoods persisted near the central core along prestigious avenues like Jarvis Street. Contemporary construction of new affluent housing was focused in the exclusive suburbs of Rosedale and Forest Hill.
Rural farm hamlets had become established at the intersection of farm concessions and major roadways. Initially intended as rural local order service centers, these concentrations shifted their functional emphasis as urbanization followed the major transportation route into the rural setting. Examples in North Toronto of this adaptation was the functional shift of Eglinton and Bedford Park to urban local order business districts.

In the fashion of a renascence, two decades of austerity programs during the Great Depression and World War II (see Figure 4.5) were replaced by an era of expansion (see Figure 4.6). The car was no longer just a luxury for the few; it was becoming a necessity. New housing was demanded to accommodate the growing population resulting from the post-war baby boom and immigration.

With the inner suburban areas essentially built-up by the time of World War II, the majority of the new development was concentrated in the three large outer suburban townships of Etobicoke, North York, and Scarborough. To satisfy the newly created demands, particularly for single family dwelling units, new subdivisions were constructed which stimulated an additional demand for functionally related facilities and services (e.g., schools, recreational, and community services). To capture these suburban markets, the retail entrepreneurs developed planned shopping centers or "instant downtown" in the newly urbanizing suburbs. Similarly, many industries saw virtue in a suburban location for their enterprise and the opportunity to make use of suburban labor force and generous industrial lots.
1. CBD
2. high-class residential
3. low-class residential
4. middle-class residential suburbs

Figure 4.5. Suburban Development and the Automobile

Figure 4.6. Suburbia and the Freeway, Arterials, and Rapid Transit
The vital role played by transportation facilities is again emphasized. The previously mentioned Yonge Street public transportation corridor was so heavily travelled during World War II that the city was prompted to sponsor the construction of a subway line along the corridor. Much credit for the phenomenal redevelopment along the route in the central city has been given to the existence of this subway system.¹

Parallel situations of urban development adjacent to transportation corridors can be deduced from examining some of the long standing freeways. The Macdonald-Cartier Freeway was originally constructed as a by-pass link in the trans-provincial Highway 401 from Windsor to Montreal. But, the circumferential road became the means whereby industrial concerns could relocate beyond the congestion of the central city on less expensive land and yet remain close enough to the city to gain the benefits from the urban agglomeration economies. An analogy can be similarly told of developments with easy proximity to the Queen Elizabeth Way which runs from Toronto to the Niagara Peninsula. In these situations, freeway construction provided the necessary accessibility to encourage urbanization pulls adjacent to the corridor.

A logical derivation of this suburbanization process involving residential, business, and industrial suburbs was the creation of new towns. Toronto also had its new town developments with the most notable

¹ See the text of an address by James Kearns, *The Economic Impact of the Yonge Street Subway* (Toronto: Toronto Transit Commission, September, 1964).
Don Mills was built as an outlying employment-residential center on a site which provided relatively low cost, easily serviced land. Since its inception, Don Mills has become surrounded by urban spread; it is now debatable as to whether or not the community has been able to retain its conceptual identity within the larger metropolitan setting.

The suburban land use pattern has been dominated by the use of the regular grid arrangement of major arterial roads (Figure 4.7). At approximately one and a quarter to one and a half mile intervals, these arterials followed the rural land surveys for farming sections. However, the greater distances to be travelled and the heavy flow of commercial vehicles in and out of the central city induced the need for grade-separated expressways. The first expressways in Toronto were linked between the downtown core and suburban nodes. The Don Valley Parkway (DVP) follows the Don River Valley from near downtown to the Don Mills area where it ties into the Macdonald-Cartier Freeway (401). The F. Gardiner Expressway (FGE) links downtown with the lakeshore communities at the Queen Elizabeth Way (QE).

While throughout North America the passenger train appears headed for extinction, in the Toronto Region freight trains are having to share their rails with commuter trains. The foremost of these day-passenger trains is the GO Train system (titled after the sponsor, the Government of Ontario). GO Transit serves the lakeshore residents from Oakville in the west to Pickering in the east. It has proved to be

Figure 4.7. Existing Boroughs, Freeways, Rapid Transit, and Commuter Rail Patterns
particularly popular as a service for commuters oriented toward Toronto CBD with approximately 95 per cent of the GO trips starting or finishing at Toronto's Union Station. The suburbs provide the dormitory end of the trip.

Near continuous construction of rapid transit facilities added the major east-west subway line along Danforth Avenue and Bloor Street. Extensions to the north, east, and west resulted in the subway service reaching the large suburban boroughs of North York, Scarborough, and Etobicoke. An integrated system of feeder buses was able to utilize the major suburban road grid network thereby giving the suburbanite ready access to the downtown core via subway.

Toronto has changed vastly from the singular self-contained center of yesteryear. The city has evolved into a center for a far-flung region. Nonetheless, Toronto's morphology as described conforms to the hypothetical urban land use pattern described in Chapter II (see Figure 4.8).

The major node is very broadly represented by the City of Toronto's CBD. The three major suburbs are also predicted in the generalized system, although, in fact, it is very difficult to precisely recognize any specific CBD type parallel in these widely spread boroughs. The inner suburban boroughs of York and East York are generally analogous to the sub-nodes; the lakeshore communities to

Figure 4.8. Adaptation of Theoretical Nucleated Pattern to Toronto
the west may be identified although politically phased out as independent municipalities. The sub-node to the east along the lakeshore did not develop primarily due to the inhibiting physiography of the Don River and its relatively broad valley.

The suburban by-pass location for the provincial freeways and belt line expressways have a diagrammatic parallel in the hypothetical system. In addition to the principal highway transportation corridors, the arterial roads and subway lines are also evident (e.g., Yonge Street, Bloor Street-Danforth Avenue, Dundas Street, Kingston Road, and Lakeshore Boulevard). The regional commuter railroad system (not shown in Figure 4.8) could be expanded from the lakeshore axis route by utilizing existing rail lines which radiate outward from the central focus (i.e., Union Station).

Other features of the adaptation of the theoretical nucleated pattern to Toronto are indicated. The much discussed expressway route to the north-west section of the Metropolitan Municipality, which is comparable to the Don Valley Parkway in the east, is predicted. Similarly, an expressway route connecting the central core and the lakeshore communities east to the 401 can be deduced. Of particular significance is the location of the major east-west subway line along Bloor-Danforth rather than radiating from the CBD. While the Bloor-Yonge intersection is a prominent node, the paramount employment center for the metropolitan area has remained the downtown CBD. Consequently,

1. The discussions over an expressway ended, for the time at least, with a policy decision by the Government of Ontario, June 3, 1971, to cease provincial support for the continued construction of the Spadina Expressway.
massive transferring is required at stations where the north-south and east-west subway lines intersect.

Insofar as the case study area has evolved, Toronto can be explained in terms of the "classical" descriptive theories on urban form and structure. The value of these models in urban planning does not rest with their usefulness as a retrospective research too, but in futuristic predictions. The city limits of the Municipality of Metropolitan Toronto are nearly fully occupied by intensive urban activities and suburban expansion has accelerated in the adjacent urbanized areas. Attention must be directed toward the development of urban planning policies for the total of the Toronto Region. What will tomorrow's urban form be like?

**Future Urban Forms**

In the preceding section of this chapter, a detailed morphology was outlined as to how the urbanized core of the Toronto Region evolved. Having established the present situation and the theoretical descriptions which are applicable to analyzing this urban development, attention must be directed toward means whereby the optimum future urban form can be created. Obviously, if the case study area is allowed to continue its spread as in the past the entire landscape would in time be devoted to varying intensities of urbanized development. Urban planning can offer a choice regarding the future growth patterns in the Toronto Region.

Basically three types of patterns or situations for the urban form can be perceived as a consideration of the classical models:
1. Concentrated (Burgess).

2. Decentralized (Hoyt).

3. Multi-centered (Harris and Ullman).

The concentrated urban form emphasizes a single dominant urban core with only very minor nodes on the periphery. The decentralized form is based on a near homogeneous dispersal of city activities and functions throughout the urban area. Multi-centered urban complexes are systems of cities or nodes arranged in a constellate fashion. Obviously, the choice is not clearly defined because of the multitude of variations possible.

Concentrated

The concentrated intense type of urban development is best represented by the work of the French architect-urbanologist Jeanneret, alias Le Corbusier.¹ Le Corbusier proposed that the city of the future should be a complete departure from traditional urban complexes. Essentially, his idea was to increase the core city density through high-rise apartments and office towers. This policy would permit a greater devotion of land space for nature, open space, agriculture, recreation, and transportation purposes. Neighborhood units would be established in megastructure and superblock complexes (i.e., living, working, and leisure activities incorporated into one structure).

Le Corbusier envisioned an optimum urban area of approximately three million inhabitants. This was composed of a central core

(400,000), suburban neighborhood units (600,000), and a rural-urban fringe area of garden cities (2,000,000). A housing mix to satisfy the market spectrum from the affluent to the lower income groups would be constructed in association with employment nodes. Industrial and commercial enterprises would be located so as to make maximum use of transportation facilities and municipal services. Within this land use configuration, the essence of the city would center on its circulation patterns; an all-purpose transportation center in a hub location would be the focus for all modes of movement.

Design principles were intended to achieve the theme: "no more waste, where upon life will become a thing of dignity and sanity again." The exclusive use of design to achieve this end verges on utopianism. Le Corbusier did not specify the means for obtainment of the concentrated urban form. Although requiring extensive redevelopment to create a new community structure within the existing urbanized city area, there was no indication of the means whereby social, economic, and political reorganization could take place to encourage this type of urban restructuring.

Decentralized

The work of the American architect Wright represents the dispersed urban form. As with Le Corbusier, it was through the use of architecture principles that the future urban environment would be

1. Ibid., p. 342.

developed. Wright's Broadacre City would have the entire population and their activities dispersed over the landscape in a homogeneous mixture of open land and built-up areas. To compensate for the loss of agricultural lands at the lower density, he pictured a return to partial subsistence farming. The automobile would play a prominent role while the commitment to the low density urban form would seem to negate the possibilities for developing mass transit facilities.

The planned spread concept has many similarities to the contemporary suburban development and would not require any substantial change in existing suburban planning policies, etc. A utopian concept, he apparently did not recognize the urban value of proximity and contact between the populous for the mutual advantage and satisfaction of culture and economics.

Multi-Centered

The polarized views depicted by the concentrated and dispersed concepts of urban form are idealistic in their philosophies. The vast majority of contributions toward the conceptualization of new urban forms for tomorrow's city have their roots in the multi-centered classification grouping first offered by Harris and Ullman. To achieve the variety of multiple node-center arrangements, which is the base element in the multi-centered concepts, extensive use can be made of the following:

1. New cities—New independent metropolitan growth centers to accept future urban growth rather than the continuous growth of the existing metropolitan center,
2. New towns—New independent towns to receive overspill from the metropolitan center in a self-sufficient community structure.

3. Urban growth centers—Stimulated additional growth to existing villages, towns, and cities about the metropolitan center.

4. Satellite communities—Dependent communities on the outskirts of the metropolitan area as an alternative to subdivision development.

These multiple centered independent nodes can be arranged in a variety of separate configurations or combined to produce a sub-system of communities about the urbanized core (e.g., radial, corridor, dispersed, or ring pattern).

Blumenfeld\(^1\) in an attempt to gain the benefits of both the concentrated and decentralized urban forms proposed a star-like or radial configuration. His multi-centered urban form was adaptable to situations where development could proceed in all directions, a stellar form (e.g., Washington\(^2\)), and a finger form where expansion is inhibited in one direction, perhaps by a body of water (e.g., Copenhagen). He emphasized that the existing urban focus for the region would be retained (i.e., the historical downtown). Future growth would be concentrated in a redeveloped downtown and along the transportation corridors radiating outwardly from the predominant center to the


adjacent urban areas. Presumably such growth would utilize, to some extent at least, aspects of the node possibilities presented above.

The transportation corridors would act as access routes. Leaving at radials from the hub, the corridors contain high speed and high capacity rail and highway facilities; optimum use would be made of mass transit. Designed for inter-city movement, these lines provide the opportunity for quick access to the core of the metropolitan center. In addition to minimizing commuting time and other costs, the integration of secondary rapid transit and roadway facilities to the main route corridor has encouraged a decentralization tendency. Non-core specialized activities could relocate as sub-node employment centers and residential dormitories in new towns, urban growth centers, or satellite communities. The author suggests that the radial concept of multi-centers would preserve a local community identity (assumably at the neighborhood level) and at the same time develop a metropolitan identity for the dynamism of the total urban area.

A diagrammatic situation can be illustrated for the Toronto Region where the radial plan was accepted as the guiding framework for the future growth and development of the area (see Figure 4,9). Present trends indicate that the Toronto Region could readily be adapted to the finger urban form. The historical location of communities and major regional transportation routes provide the base elements. The expansion of existing villages, towns, and cities and the infilling with new town and satellite centers would complete the urbanization process in the corridors. The interstitial spaces would be preserved for agricultural production, recreational activities, and open space relatively close to
Figure 4.9. Radial Urban Form Development
the urbanized area. Strict legislation would be necessary to remove pressures to develop the areas between the development corridors.

Despite Blumenfeld's confidence, it has been theorized by others, most notably Doxiadis,\(^1\) that the star-like concept is in reality a transitional stage of urban development. Over time, it will evolve in a pattern similar to the concentric rings as infilling occurs in the interstitial areas between the transportation corridors. Doxiadis counters with a modified multi-centered concept which emphasizes development along one main corridor between the existing metropolitan center and a new metropolitan center (see Figure 4.10).

Doxiadis believes that the contemporary urban complex cannot be adapted to satisfy future demands without major surgery. To meet the essential needs of tomorrow's megalopolis and not destroy historical heritage, he proposed the creation of a new city center independent of all existing centers. He stated that "... in order to save our cities from the problems created by their dynamic nature, we have to guide growth not by creating centers of lower order but by creating centers of higher order ..."\(^2\) There would be a gradual shift of metropolitan order functions toward the newly created center and it would be the site of new higher order functions that emerge. This advocacy of an extra-human scale for future city developments is consistent with Doxiadis' perception of a world-wide network of cities.

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2. Ibid., p. 193.
Figure 4.10. Corridor Urban Form Development
(i.e., Ecumenopolis) shaped by the attractions of existing cities, inter-city transportation corridors, and resources (e.g., water).

The Doxiadis proposal represents a complete departure from the established philosophies prevalent today. While the concept has been systematically developed, the specific type of political environment necessary to facilitate the implementation of the theory is not generally available at this time. Strong political influence would be required to surmount the friction of attraction provided by existing urban centers and to direct growth into the new center sited on open land. The details related to funding and construction of municipal services and transportation facilities in addition to living, working, and recreating facilities will have to be negotiated.

The actual selection of a site for the new metropolitan center would be a product of extensive research. However, even without a twin urban concentration, a linear city has evolved about the west end of Lake Ontario. As with the radial form, the economic benefits generated by the major transportation corridor and its related spin-offs are substantial. But, the ease of access to the Lake Ontario water supply has in fact fostered the evolution of a linear urban form. Non-shoreline areas lack sources of water supply and means of discharging treated sewage effluent unless long distance pipeline


techniques are employed. It was the lack of these essential services inland which was responsible for the directioning along the lakeshore.

The preceding urban forms proposed by Blumenfeld and Doxiadis emphasized a contiguous urban development pattern. Consideration must also be given to the viability of a dispersed node urban form. Such a nodal system is developed beyond the built-up zone and may include new towns, stimulated growth centers, and/or satellite communities.

The "new town" experiment for post-war London is one of the best studied. Hall describes the British new towns as a combination of towns built on virgin sites and stimulated growth of existing communities. Generally, a new town has sufficiently large a population to support its citizens with a variety of employment opportunities, residential accommodation, shopping, entertainment, educational, and community facilities and services. The community is arranged in such a comprehensive fashion to remove dependency upon the neighboring metropolitan area.

Since these new communities are intended to receive the over-spill from the major urban focus, it is essential that close links to the urban core be retained via good transportation and communication networks. It is equally important that the new community be located beyond easy commuting range of the metropolitan center. In further removing the sub-center from the paramount node by time-distance, the intervening areas of non-intense urban activity are better equipped to withstand the pressures for urbanized development,

1. Peter Hall, London 2000 (London: Faber and Faber, 1963),
The major contributing factor to the success or failure of a new town would appear to rest with its ability to attract employment activities. The economy of many of the towns, villages, and hamlets that lie beyond easy commuting distance to the metropolitan center have stagnated. The youth must depart to the city for their higher education and places of work, industrial concerns prefer the agglomeration economies of the larger city, and associated linkage factors could place the community's future in doubt. A policy of decentralization where feasible and the designation of selected communities as growth points would bring about the rebirth of such communities as new towns.

Some existing urban centers which are sited beyond the immediate urbanized area of the metropolitan municipality are possible candidates for new town expansion (see Figure 4.11). While the communities noted have generally stable economies, they are not as productive as they might be were the community a sub-node within the structure of cities of the larger urbanized region. The following communities have populations of 20,000 to 60,000 inhabitants and satisfy broad criteria for essential physical services thereby making each a theoretical candidate for new town designation: Guelph, Barrie, Peterborough, and Cobourg.

Of necessity, it may be desirable to establish entirely new towns on relatively virgin sites (see Figure 4.11). This type of restructuring and construction would require, albeit to a lesser degree, the same sort of elaborate planning, incentives, and political intervention necessary for Doxiadis' twin metropolitan center concept. Sites adjacent to Orangeville, Midland, Lindsay, and Bowmanville should be examined as possible sites for new towns. Located at distances beyond
Figure 4.11. New Town Urban Form Development (Existing and Virgin Sites)
reasonable commuting range, these established communities have conducive transportation ties to Metropolitan Toronto.

The final development concept is the satellite alternative (see Figure 4.12). A satellite, by definition, is dependent upon a central focus for its existence. Nonetheless, this does not preclude a satellite city's emergence as a viable community with its own living, working, and recreating aspects (i.e., it is not necessary for the satellite community to be used exclusively as a dormitory center and its labor force commuting elsewhere to work).

Satellite communities are urban sub-nodes on the periphery of built-up areas. While it may provide all the necessities for a stable life as a small isolated community and be politically independent, the center is close enough to a major urban core to reap the benefits of the nucleus also. In fact, the satellite's reason for being is dependent upon the close proximity to the metropolitan center.

Advocated as a means of overcoming the detriments of urban sprawl or planned dispersal, satellite developments would appear to be in reality another form of subdivision-type development. Toronto's best known satellite community is Bramalea. The scale of this development permitted a coordination of installation procedures for facilities such as the essential physical services. Other economies of scale were generated by bulk purchasing and standardization practices. The most significant advantages to this type of urban expansion is the opportunity for experimentation in planning and research.
Figure 4.12. Satellite Communities
A hybrid offspring of Howard's\textsuperscript{1} escape city idea, satellite cities share many facets with the previously discussed new towns. Both concepts would place a disruption factor on the particular locale to which they may be allotted. The main distinguishing factor, and that which requires a separate consideration of satellites, is the relative proximity via time-distance to the central urban area and corresponding population scale, employment opportunities, and other socioeconomic benefits at the metropolitan level.

Within the Toronto Region the following general areas would appear to provide the most advantageous locations for satellite urbanization: north Oakville, Milton, Georgetown, north Whitby,\textsuperscript{2} Bolton, Aurora-Newmarket, Uxbridge, and Stouffville.

Summary

This chapter has been primarily concerned with the integration of theory to the case study situation. Toronto's morphology was described in terms of its historical adaptation to the theoretical models. Subsequently, a series of alternative trends and concepts were developed in the abstract. Selected communities were designated as possible sites for future urban expansion based on the exclusive adoption of the concept under consideration and its associated spatial

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\textsuperscript{2} The first four sites were proposed in the Metropolitan Toronto Planning Board, *Urban Form in the Toronto Region, 1995* (Toronto: the Board, Metropolitan Plan Review, April, 1970), Report No. 4, p. 49.
patterns. It is now necessary to evaluate the feasibility of these alternatives in terms of a comprehensive development proposal.
CHAPTER 5

EVALUATION AND CONCLUSION

A series of alternative urban forms were postulated in the preceding chapter. Each pattern was viable in satisfying the intent of the commonly articulated goals of the Planning Process, Chapter 1. Nonetheless, no single concept is capable of producing "the" solution for future urbanization in the Toronto Region.

It is the purpose of this chapter to examine the various situations proposed and, specifically, to emphasize the feasibility aspects of their technical implementation as divorced from political determinism.

Planning Strategies

Obviously any or all of the discussed urban structures are possible if the necessary legislation (and incentives) are enacted. However, the essence of political expediency is to support programs that reinforce the policies for which the decision-maker was selected. The planner's role is to provide a degree of "expertise" in assisting the politician in making decisions.

Priority weighting of objectives and identifying trade-off options are elements of the urban planning profession which make the politically-administered "art" into a "social science." Society's goals must be elaborated in terms of:
1. Implications of one objective upon the others.
2. Implementation constraints.

It is meaningless to expect that an urban form concept could be implemented by superimposition upon the landscape. Local physiography is not homogeneous; socioeconomic phenomena are not discrete. Thus the ability to adequately predict the "total" impact of involved variables is challenging. Such coordination of future urbanization with limited knowledge and incomplete information is what makes the "science" of urban planning into a delicate "art."

Implications

A blend of physical, economic, and social elements must be achieved as the factors are converged to produce a human habitat. But the implications of adaption must be explored (i.e., an investigation of the interactions between man and his environment and not just the alternative urban forms). Too often this critical aspect of urban form studies is ignored.

While originally attempting to focus on accessibility as the determining factor, it becomes apparent that the isolated discussion of only this element is impossible. A prominent series of linkages emerge:

accessibility %|\| |urbanization
environmental %\| |serviceability
compatibility
In general, "accessibility" can be defined to mean proximity in urbanism so that living, working, and recreating areas are within easy time/distance of one another. "Urbanization" suggests a consensus will be identified wherein the process of encouraging more non-agrarian land uses and population will be intensified, the present growth rates will be continued or the existing urban bounds and metes and population level will be stabilized. "Environmental compatibility" refers to the ability of urbanism to co-exist with areas conducive to agriculture and nature. "Serviceability" implies an acknowledgment that urbanism can be sustained because of suitable conditions for local water supply and sewage disposal facilities (i.e., avoidance of complications associated with depleted water sources, contamination, and/or a tampering with recharge areas).

Thus, the selection of an urban form concept is further compounded because one cannot consider accessibility, for example, without observing the implications it may have upon:

1. The environment (e.g., right-of-way desecration of wilderness sanctuaries and wildlife habitats).

2. The serviceability of the area (e.g., an area with a high accessibility rating cannot be developed if the servicing difficulties make the installation costs for physical services prohibitive).

3. Urbanization (e.g., our historical examples reveal a tendency for development to stimulate further development).

This cycle of linkages and spin-offs can be repeated several times and other variables may also be introduced. The message is clear—in the
urban web, the altering of one variable will result in a repercussion wave passing through all the other variables.

**Implementation Constraints**

The suitability of one urban form vis-a-vis another is a product of perceived social values. How big is big; to grow or not to grow. What does society prefer—quantity or quality; materialistic facilities to ease life or an harmonious rapport to sustain his habitat. Which life-style option is chosen—single-family dwellings or high-rise apartments, freeway networks or mass transit systems. In a macro-metropolitan study, specific implementation constraints must be understood in terms of local parameters. Four variables are discussed in this section: urbanism, physical resources, circulation, and social values.

**Urbanism**

Stable communities resist disruption. But frequently their successful equilibrium is threatened by the desires of a non-resident majority. As previously discussed, increased urbanization may be effectuated by development in previously non-urban fringe areas, stimulation of existing hamlet-type sub-nodes, creation on virgin sites or via redevelopment. To sustain implicit confidence and avoid unnecessary social up-rooting, urbanization must be directed toward "suitable" growth poles and not merely to points of least resistance.

Assumedly it would be least disruptive to encourage redevelopment in existing urban nodes. Such logic is not universally applicable. Many small hamlets and villages prefer to remain at the particular
stage of urban evolution they have achieved—predominantly rural. The disruption caused by "city folk" migrating to the country and then trying to make the rural setting a duplicate of the cityscape, sophisticated urban facilities and all, is to be avoided. Similar analogies can be detailed for established city neighborhoods.

The planner must be aware of local identities and sensitivity related to urbanism. Historical incidences have illustrated events in which the final decisions of the "city fathers" and the Provincial Cabinet have been altered or reversed. Neighborhood pressure groups accomplished this end despite the recommendations of technical committees at the municipal, regional, and Provincial level.

Physical Resources

A generic consideration of physical assets on a site includes special studies on human features (e.g., physical development), biological features (e.g., natural habitats), and physiography (e.g., terrain and hydrology).

The example offered by agriculture clearly illustrates the need for comprehensive policies on physical resources to eliminate land use conflicts. In many cases, agriculture has been the crucial issue in macro-regional studies. And, all too often, the areas most conducive to growing of agricultural produce are sacrificed to satisfy the demands for additional urban construction.


Toronto is not an exception. Land is a limited resource and with the activation of the urbanization process the situation is emphatically clear. The preservation of farmlands to facilitate food production is in direct competition with the demands to make more land available for intensive urbanization (e.g., housing). Options must be explored to resolve competition between intensive and extensive human utilization of the land.

At the macro-level of inquiry, incremental or field-by-field parameters for agricultural production are not feasible. Nonetheless, a series of broad scale indicators must be presented prior to the formulation of future land use policies. Weighting values as to land use preferences is further modified by "... the demand for food, farm production, population growth, the resource base, profitability and a host of other factors." The policy maker should also be aware of the economies of scale required for contemporary farming practices (i.e., modern machinery and equipment suggests that future farms will require fewer people and more acreage and yield higher per capita earnings). Quality variation in agricultural productivity does not necessarily imply less productive agricultural pursuits (e.g., some tender orchard


3. Ibid., p. 283.
crops thrive on land less conducive to general field crops). Lastly, farm operations can provide an essential open space in an urban landscape.

While the focus here has been upon agriculture and its discord with other human physical developments, corresponding analogies could have been related for the infringement of intensive urbanization upon natural habitats (e.g., the draining of wild fowl marshes) and terrain (e.g., the filling of ravines).

Circulation

The third implementation constraint is based upon circulation modes. Tendencies toward single-family detached houses or high-rise apartment units are determined by a multitude of variables. The most distinguishable variables at the macro-area level of study are urbanism, physical resources, and circulation systems.

Urbanism sets the boarders of city expansion and thereby controls the amount of serviced land available for future growth and directly affects market land costs. Physical resources dictate the direction and extent of the intensive urban encroachment on the rural countryside by inciting or barring development. Circulation relates to the modes of movement used to travel about the urban center and between other urban nodes.

Circulation includes all aspects of the movement of people, goods in transit, and information. At the regional level, and in the frame of a land use development concept, we are more concerned with the transportation of objects rather than the exchange of ideas through
communications. Specifically, transportation means and modes need evaluation.

Systems of circulation are a topic which accentuates the polarization of people/goods transportation ideologies. The "experts" damn the automobile and praise the merits of mass transit. Yet the popularity of the independent chariots continues to grow as exemplified by more traffic snarls and ever increasing passenger vehicle registration.\(^1\) Public transit is also enjoying increased popularity in centers such as Toronto.\(^2\) But popularity of mass transit has swamped the system of subways and feeder buses during peak transit periods.\(^3\) Do either of these seemingly contrary perspectives represent the ideal solution?

The folly of motor vehicles is well known.\(^4\) As the utilization of the auto increases, congestion increases and the result is more land space being devoted to roadways and parking. Cars are also great

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1. The decade 1961-1971 saw passenger motor vehicle registration in the County of York, including Metropolitan Toronto, rise from 529,395 to 788,820. For the nation, the jump was from 4,325,682 in 1961 to 6,967,247 in 1971. Both sets of figures are according to Statistics Canada, "Registrations," The Motor Vehicle, Part III (Ottawa: The Queen's Printer, 1961 and 1971), Cat. No. 53-219, Table 3, p. 14 and Table 1, p. 9, respectively.

2. Statistics reveal that the Toronto Transit Commission carries an average of approximately 150 rides per capita per annum, or double the Canadian rate and four times the average in the United States. Figures are cited from Metropolitan Toronto Transportation Plan Review, "Public Transport," Strengths and Weaknesses (Toronto: the Plan Review, March, 1973), Report No. 18, Part 1, p. 27.

3. Research on the subway system for a normal workday showed that half the system's total patronage occurs during two "rush hours"—7-9 a.m. and 4-6 p.m. See Toronto Transit Commission, The Solution Is Staggering (Toronto: the Commission, July, 1972), p. 1.

consumers of petroleum energy; the inefficient internal combustion engine is responsible for the generation of extensive quantities of atmospheric pollution. Perhaps even more somber to man's welfare is the tragic slaughter and maiming that is directly attributable to motor vehicles.

What alternatives do we have to the automobile? Mass public transit fails to satisfy the need for access. Door-to-door convenience is not a function of rapid transit service; long waits at transit stops or long walks to pick-up/drop-off points are inevitable and contribute to the discouragement of public transit patronage. Consequently, urban development follows the tradition of point-by-point transit service and creates high density zones about transit nodes. The original subway line in Toronto was built to serve the central business district employment concentration; it merely replaced the congested surface street car route with a subway. Complementary development such as high density development connected by a high capacity transit line reinforced the prominence of the central core as the most accessible part of the total metropolitan area.

Access to downtown is highest along the subway corridors. The availability of mass transit has stimulated redevelopment as the previous land use becomes relatively under utilized. This economic stimulation produces a snowballing effect and further redevelopment.


occurs in the secondary zones of accessibility (e.g., along feeder bus and street car lines). A cycle emerges of high density (usually high-rise in Toronto) apartment and office buildings to house downtown workers and, once again, the main transit facilities to the central business district becomes saturated.

The obvious solution to partially relieving these basic circulation difficulties would be to extend rush hours. A doubling of the peak movement periods would spread the passenger load on transit facilities and vehicular flows on roadways. An extension of traditional periods for journeys to and from work would make greater utility of existing equipment and facilities. The extended ban on street parking during rush hours would enhance both passenger car and surface transit flows with minimal obstructions.

In order to present the necessary circumstances for an extension to rush hours, many major employers will have to "stagger"1 the work shifts of their employees. Some firms in high-rise office complexes follow this practice so as to avoid queues at elevators. The philosophy is now to be applied to the city so that employees travel to and from their place of work in sequences earlier or later than the previous norm.

Technological solutions and developments are being sought to resolve the transportation dilemma. The spectrum of technocratic studies range from the private remote controlled transit system to the

1. Staggered work hours imply a policy by which employees work their required number of hours but do so in sequences that commence at schedules beyond the usual (e.g., not coincident with the traditional 9 to 5 workday),
magnetically suspended intermediate capacity transit system. The former is a family of vehicles, not unrelated to today's automobile, yet on a controlled course and capable of assembly to form a hybrid mass transit system. The latter is a public transit system designed to fill the void between a subway and surface buses. Usually elevated, it provides virtue in being rapidly constructed at significantly reduced costs and aesthetic acceptability (e.g., comfortable, quiet, and less disruptive to its surroundings).

Other choices have to be explored to achieve optimal circulation. In a world of free choice, the balanced transportation system ideology must be advocated. Planners must stop speaking in terms of either/or situations.

Social Values

A summary of the three preceding implementation constraints illustrates the importance of social values to planning. Is it more important to encourage this and to discourage that? Discourses of this nature raise the ever intangible issue as to whether the wishes of the majority should take precedence over those of a minority.

To grow or not to grow, that is the choice of urbanism. Toronto is a vibrant hub for Canada and it will continue to propagate as well as to attract people from other parts of Ontario, the nation, and the world. The placing of these people in the Toronto Region will hinge to a great extent on the urban form produced by aggregate social values.

It is acknowledged that the physical resource agriculture is an important feature of the Toronto Region. Intensive urbanization would more rationally be designated to zones of low agricultural capability. Areas of biological and/or physiographic virtue should receive equal consideration in determining the direction of future urbanization.

Circulation is the cornerstone of macro-area development. Nonetheless, it is at the micro-level (i.e., neighborhood) that its demands are manifested. In order to cause less disruption to neighborhoods (e.g., fewer displaced families, less real estate consumption, and a smaller wedge in the urban fabric) the experts recognize mass transit. The result is high density dwellings and offices, but such high-rise living does not make a neighborhood.

A goal is to create an efficient and healthful environment. Yet such creations are not always satisfactory. Formless spread is regulated into efficient regular lot sizes and shapes for purposes of economics, taxes, and circulation. While the gridiron street pattern was optimal for physical services like sewer mains, it did not take advantage of local topography for drainage, soils, vistas, etc. and often produced an aesthetically redundant cityscape.

A goal is to present a diversity of opportunities. In dwellings, we want a choice between high-rise and low density, new and old buildings, high and low cost construction, downtown and rural location. Social considerations determine the matrix of availability in choice, particularly if it is to differ from traditional city core high-rise, suburban single family, and rural farms.
A goal is to foster an identity for the community. However, in the age of instant electronic communications, the global village syndrome has evolved. The hierarchy of urban concentrations—the megalopolis, the metropolitan area, the city proper, the ward, and the neighborhood—each vie for an identity. Today's life styles have precipitated a conflict between the individual and his person and his community's set of social values.

The answerability of these questions related to social values is dependent upon the parameters of planning strategies and implications of decisions.

**Selected Urban Form**

It must be reiterated that the proposal herein submitted is in the conceptual abstract. The need to conduct extensive research and special studies on a wide assortment of other planning variables is not precluded. Incremental, detailed investigations are necessary prerequisites to the formalization of a regional plan for the urban form of the Toronto Region.

**Scale of Regional Centers**

History has suggested in Chapter 2 that urban settlements will evolve into a hierarchical system of major and subservient nodes. On a homogeneous landscape situation, it is conceivable that a parallel phenomena could be extrapolated to a regional scale. But on a landscape such as abound the Toronto Region, irregularities in landforms (e.g., lakes and ravines) have significantly molded the terrain. Furthermore, historical events have altered the setting through a
multitude of development commitments which cannot be erased nor ignored. As a consequence of local uniquenesses, the hierarchy of urban centers is not expected to adapt invariably to the hexagonal theory.

With the above reasoning in the fore, a schematic framework to be applied in the study area can be postulated (see Figure 5.1). The level of service provided by each hexagonal set that lies about the core node A is indicated, on an arbitrary scale, equivalent to the diameter of each set. The distance between node A and node E was established at 75 miles or the maximum limit of "easy" daily commuting in the Toronto Region.1 The remaining nodes are based on ratios at points where their respective hexagonal line intersects the base line. This bar graph is analogous with the location-rent function of Figure 2.1.

The hypothesis can then be applied to a diagrammatic pattern for the Toronto Region (see Figure 5.2). Node A is the highest order complex and at the core of the region; it is synonymous with Toronto. Concentric circles are placed at intervals from node A out to a distance of scale E. The hypothetical development radials, based on the central-place hierarchy, can also be postulated for the region.

Compatibility: Nucleated Hierarchy and Urban Forms

In proposing an optimum urban form for the future development of the Toronto Region, acknowledgment is due to the existing circumstances

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1. For purposes of this study, it has been assumed that, on the average, the majority of inhabitants in the region would not be willing to spend more than 75 miles time-distance in their journey-to-work from the periphery to the core.
Figure 5.1. Central Place Hierarchy: Scale and Distance of Nodes

Figure 5.2. System of Cities: Predicted Regional Location
and foreseeable trends as discussed in Chapter 4. Accordingly, aspects or variations of the radial, corridor, new town, and satellite community patterns will be incorporated into the selected regional planning concept. Thus, the need to record on a regional map the total of all possible communities previously considered (see Figure 5.3).

A synthesis of the central-place hierarchy system of cities and the totality of discussed urban forms will reveal zones of coincidence.

The concentric ring 12.5 miles from Toronto corresponds approximately to the existing or proposed urban centers of Mississauga, Brampton, Richmond Hill, and Pickering. Application of the central-place theory predicted all of these communities. Neglected were the lakeshore communities of Port Credit and Ajax which, in reality, are absorbed by Mississauga (Port Credit) and Pickering (Ajax).

Similarly, the arc at 25 miles intersects the centers of Oakville, Milton, Bolton, Aurora, Stouffville, and Whitby. But Oakville and Aurora did not agree with the anticipated result. Oakville constitutes a subordinate node along the rim of the Lake Ontario megalopolis; the merits of its future role will be evaluated subsequently. Aurora, although a component of the northern urbanized axis, is more readily included in the Newmarket node of the next tier.

The 37.5 mile ring passes through the Burlington, Georgetown, Newmarket, Uxbridge, and Oshawa series of centers. All these communities were foreseen with the exception of Oshawa. Oshawa and Hamilton (sited on the periphery of the arc) share a unique existence in that both are long established centers which essentially serve to
Figure 5.3. The Toronto Region Model Aggregate
accommodate specific industries (i.e., automotive and steel production respectively). This course of events has skewed the pattern of projected symmetry.

Urban centers in the range of the 50 mile zone from the core are not predicted in this conceptual configuration. Assumedly, such nodes would be more closely associated, in the mature system of cities, with the influence sphere exerted by their superior center on ring E. Therefore, the centers of Guelph, Orangeville, Barrie, and Lindsay are deemed to be not significant to the future urban growth framework for the macro Toronto Region.

The hierarchy indicates that the highest order urban complexes next to the Toronto core will be located in a radius of about 75 miles. Qualifying centers are Kitchener-Waterloo, Midland, Peterborough, and Cobourg. However, Midland and Peterborough failed to be adequately predicted in their alignments by the central-place theory.

While the preceding has revealed nodes that are compatible with the central place and urban form conceptual propositions, they have been selected in isolation of the objectives of the study. A continued stressing of the selected centers can only be pursued if the location meets the criteria dictated by the implementation constraints.

Technical Modifications

The foregoing has revealed the communities which satisfy criteria in compliance with the two theories being tested:

1. A hierarchy system of cities,
2. An amalgamation of hypothetical urban forms.
It must now be established if these selected centers are equally capable of meeting the constraints of implementation enunciated earlier: urbanism, physical resources, and circulation. By imposition of these standards, it will be possible to technically identify areas within the region most susceptible to urban growth and, conversely, the areas least conducive to urbanization.

Urbanism, its stimulation or retardation, must be sensitive to local plan commitments. It is inevitable in some areas that considerable development commitments will already have been undertaken. The negation of these agreements is not generally tenable as decisions of previous authorities must be respected.

However, it is apparent that in order to cease the continuous expanse of urban sprawl in the urbanizing areas about Toronto, intensive urbanism must be curtailed. The submitted proposal would direct growth into specific centers as growth poles. These growth centers are arranged in a hierarchy scale A through E and aligned in a radial pattern.

In essence, the hierarchy requires a series of nodes, second only to the Metropolitan Toronto core, evolve at suitable locations at a range of approximately 75 miles. The dissociation is contingent upon the availability of eminent transportation and communication links which reinforce the nucleated bond with Toronto. Respective densities will escalate as the relative nodes are reached in the corridor;

1. This is a particularly realistic issue for planning in that to erase previous contracts would inhibit the politician and entrepreneur in scheduling undertakings beyond the terms of elected officials.
infilling of the interstices will occur between centers and not between radials.

Prior to effectuation, a clear understanding will have to be nurtured among senior governments and local perspectives. The imposition of policies to control the evolutionary process at the micro level must be devised so as to take account of local uniquenesses and, at the same time, demonstrate the positive and essential aspects of a regional conceptualization.

Physical resources dictate some of the most rigorous influences on the various centers so far selected. Water supply and sewage disposal capabilities have combined to produce the critical limit to potential urbanization in many locales. Both attainable population and economic expansion within specific zones are correctly regulated, to some extent, by Provincial policies¹ designed to protect the natural environment and human habitats. This will restrict much urban growth in nodes not capable of access to the water sources provided by the Great Lakes (i.e., Georgian Bay and Lakes Huron, Erie, and Ontario); presumably, long distance pipelines for water supply and discharge will not become popular.²

¹. Ontario's Ministry of the Environment, Water Resources Division, has forbidden the construction of up-stream sewage treatment plants. The reasoning being that, even after complete treatment, the quality and quantity of water going to downstream communities will be altered (and perhaps contaminated) particularly if the up-stream centers experience extensive population and industrial growth.

². The Regional Municipality of Waterloo is investigating the feasibility of a pipeline to one of the Great Lakes.
For instance, the scale E centers of Kitchener-Waterloo and Peterborough do not have access to any large body of water. On the ample side are Cobourg and Midland, although the latter was not originally predicted as to its location on Georgian Bay. It would, therefore, seem reasonable to encourage urbanization into Cobourg and Midland; Kitchener-Waterloo and Peterborough, while still achieving major center status, will be affected by their inadequate water supplies and correspondingly restricted.

Scale D communities such as Burlington and Oshawa are well endowed with sites on Lake Ontario. Difficulties are foreseen for Georgetown and Uxbridge. Newmarket will also be limited because of dangers to Lake Simcoe. The same can be stated for scale C centers; the lakeshore centers are suitably equipped, whereas the inland communities will have water-supply problems with future urbanization. Apparent is the creation of a series of urban centers (e.g., Oakville and Whitby) on the rim of Lake Ontario between Hamilton and Oshawa.

A second phase of the physical resource constraint is the importance of resource production lands. While some of the centers noted have poor potential because of inadequate water sources for urban growth, these same locations are ideally suited to agrarian pursuits. The major outdoor recreational potential lies in the cottage lands north of Lake Simcoe and along the Lake Ontario waterfront. The devotion of these lands to non-intensive urbanism will simultaneously

1. Lake Simcoe is surrounded with numerous small and medium sized communities and saturated with recreational cottages; it is doubtful with present technologies that its waters can absorb the impact of additional urbanization.
afford the densely populated corridors with open space and a zone for environmental regeneration.

Circulation-transportation regulations exhibit some of the more obvious, yet formidable, conditions for future development of the proposed urban form. In fact, transportation acts as a corollary to urbanism with respect to the merits of a corridor arrangement. It has been illustrated that maximum efficiencies in transportation occur in the linear configuration. Eight linear development corridors were predicted in the hexagonal theory, but as the region matures only the four radials of the hypothetical urban forms seem probable. Thus, it is desirable to promote centers in a series of nodes along a radial from Toronto.

From a transportation standpoint, a proposal which utilizes the four proposed corridors has double benefit: it incorporates the existing trends of urbanization, and secondly, it makes maximum use of the existing transportation investment (i.e., buildings and equipment facilities and rights-of-way). Carrying forth the proposal will result in a prudent investment of public monies through the conservation of lands devoted to transportation and storage; advanced and innovative transit technologies can be attempted at both the regional and the local service scales.

In summarizing the technical modifications, a set of mutual compatibilities emanate. To achieve the objectives of urbanism, a radial development corridor is recommended. This simultaneously satisfies transportation desires to have a limited number of routes, so that efficient and sophisticated ideas can materialize and high level
service links provided between centers. The preservation of physical assets is another benefaction of the corridor urban form because minimal space is devoted to intensive urban uses.

The proposed urban form for the Toronto Region is depicted in Figure 5.4. It is a product of the deduction methodology whereby a total urbanization process was scrutinized, and then, nodes deleted or stressed depending on individual conformity to the theoretical restraints and the implementation constraints.

Additional technicalities must be resolved in the course of actually implementing the urban form set forth in this study. Necessary incentives will have to be sought to encourage large scale employers to locate in de-centralized centers and thus comply with the advanced hierarchy. Ideally, these administrative or industrial based suburbs would be clustered about the main transit facility terminals. Such action would enable employees the utmost in accessibility to mass transit. However, the problems associated with massive transferring and provoked congestion at transfer points, as was the case with the Yonge-Bloor subways, must be circumnavigated by having transportation serve the land use. Similarly, the dilemma created by having commuter traffic (e.g., GO Trains) share railway lines with freight trains must also be negotiated satisfactorily.

The next phase of this urban form proposal is the allocation of more detailed a designation of land uses. These incremental aspects will be within the spirit of the conceptual frame and determined by specialized area studies. Land capability analysis must be commenced. Surveys, inventories, and other sources of information related to the
Figure 5.4. Proposed Urban Form The Toronto Region

- Urbanized corridor
- Intense urban node
- Agriculture-open space
- Recreation
existing activities, structures, and natural environments need to be ascertained and evaluated. Socioeconomic characteristics and other constraints can be scrutinized by study areas. Subsequently, a complete regional plan can be formulated, discussed with the citizenry, amended if and where required, and proposed for implementation in the Toronto Region.

Conclusion

The end product of this thesis is a macro-metropolitan development concept for the Toronto Region. Of equal importance is the means by which this end was obtained. Urban planning philosophy and methodology were merged to establish parameters in which a case study situation could be analyzed and future planning commitments based.

In the introduction, it was acknowledged that consideration would be given only to selected aspects of the total planning process. Implications of policy-decisions by others (e.g., the Government of Canada regarding immigration practices, the entrepreneur with investment and technological opportunities, and the individual on his choice of life styles and standards of living) will have a profound impact on the eventual urban pattern. The idealism of ignoring these variables does not diminish their importance to the total context. Nonetheless, pursuit of such ramifications is a constituent element of secondary, more detailed probes. These omissions do not affect dramatically the theory evaluation nor the results of the study.

The focus has emphasized a methodology whereby the planning utility of a select set of existing models was established. Secondly,
the link between theory and practical adaptation was tested. These analytical processes fell within the context of achieving the stated goals—healthful, efficient, and an environment providing opportunity in diversity.

The central place and urban form theories, "classical" in their status, were applied to the case study region. Initially, they were adapted to the historical setting so that parallels between the theoretical predictions and later events could be surveyed. The distinct similarity which materialized laid way for the hypothetical urban form to be extrapolated into one diagrammatic dimension of the regional growth concept.

The applied models, being void of real world complexities, were suitable for the case study region. But, the formalization of a plan must meet certain criteria. To accomplish the objectives of urbanization, urban sprawl was eliminated by a hierarchical arrangement of centers according to economies of scale. To attain the objectives of environmental compatibility, the need for proximity to a major water supply and reduced servicing costs dictate a service corridor alignment; the desirability of preserving prime farm and recreational lands demands urban concentrations. To obtain the objectives of circulation, radials from the regional core are the most effective links in terms of both time/distance and facilities. Together these elements produce a nucleated urban form.

The proposed urban form is a total system. A variety of community scales are to be offered in the nodal spectrum from a city through to a neighborhood. A diversity of living, working, and
recreating opportunities are to be encouraged. The result is a balanced equilibrium between the relative intensities of urban development in the Toronto Region.

Consistent in the aforementioned experiment was a nucleated arrangement connotating a theme of regularity in design. Such repetitiveness is the foundation of predictability and this ability to predict makes planning possible and feasible. The adaptability of models, however simple, constitutes a valuable input into the planning process.

While transportation access, environmental preservation, and physical servicing are the tools to serve, a regional approach by governments is the means to administer. Past experience has shown that the incremental construction of plans by municipalities, provincial departments and agencies has often been counter productive; each jurisdiction devises plans which are ideal for their particular self-interests. Lost is any common appreciation for the total region. Urban planning, being a political device, must assist the decision-makers resolve issues, incompatibilities, and enact plans which coordinate studies, policies, and programs,

The time honored statement that you cannot please all the people all of the time is never more applicable than to planning. Urban planning is prescribed by the people; they own or manage the land and operate within the will of their own motivations—the human element. Thus, to predict any one urban form as being inevitable ignores the human element. It then follows that the aggregate urban form will be a product of many individuals and their incremental perception of
themselves, their fellow man, and nature. There will be as many variations to the urban models as there are perceivers.

The preceding discourse represents one planner's perspective of tomorrow's urban form in the Toronto Region, the shape of things to come.
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