

CENTRAL AREA PLANNING FOR SMALL URBAN CENTRES

A Thesis

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In The Department

of

City Planning

by

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PREFACE

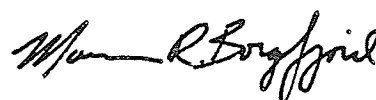
In the course of my work as a town planner, I have often been confronted with the planning of the central business districts of small urban centres. The experience of numerous studies, meetings, and field observations has made me increasingly aware of the problems of the commercial core areas of many towns and the need of a comprehensive planning technique for identifying and solving central area planning problems. There has been a tendency on the part of towns to extensively overzone for central commercial and business uses, thus diluting the effectiveness of the core area as an efficient compact unit. The district, which is the oldest part of the town, has also been subject to physical deterioration of its structures. These and other problems were suspected to be caused by inadequate zoning and development practices because of a lack of knowledge of the location, the size, the extent, and the dynamics of the central business district. Therefore, against this background I selected this topic of study.

The study presents a theoretical framework of urban structure to explain the internal dynamics of towns. A planning technique is presented for delimiting the central business district and for measuring physical deterioration of its structures. It has been conceived in a written and a graphic format and it is my express wish that it will offer a more comprehensive approach to the planning of the central areas of small urban centres of Manitoba.

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Special acknowledgement is due to my advisor, Professor Basil M. Rotoff, for his direction and encouragement. Thanks are also due to those who assisted in this project: Nicholas Kuszak compiled data both in the office and in the field; Anthony E. Kowaluk, also assisted in data compilation and drew the figures and the maps; and Irene Urichen typed the final manuscript.



Marvin R. Borgfjord

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INTRODUCTION

INTRODUCTION

The Problem

Statement of the problem. The purpose of this thesis is to consider central area planning for small urban centres such as are found in rural Manitoba in order to identify planning problems and to establish a methodology for solving these problems. The central hypothesis is that a systematic planning technique could be formulated to develop a more comprehensive approach to the planning of the central areas of our larger towns. Consequently, the intent was that the planning technique developed could have wide application and be a useful model for assisting planning commissions and planners in planning the central business cores of their towns.

Importance of the study. During the past decades, particularly the last two, small urban, prairie centres have experienced change at a rapid rate. Forced migration from farms and local trade centres to larger regional centres and cities because of a lack of diversity of opportunities for employment, goods, services, and cultural and recreational pursuits, has contributed to population decline. Gerald Hodge, in his seminar on the decline of rural communities of Saskatchewan, expressed the view that the basic problem in the small prairie communities is instability. These communities are caught up in the process of change and possess few resources to make the change meet their own objectives. This instability hits all segments of the community: the

residents, the businesses, the local community, and the farm community.¹ Consequently, there are two manifestations: first, many local trade centres are declining; second, the larger regional service centres are growing.

The Manitoba Government has published a report, *Guidelines for the Seventies*, one principle of which is the implementation of an effective *stay option* through policies and programs which will prevent Manitobans from being coerced by economic forces to leave their province or to leave the region within the province in which they prefer to live.² This policy stems from the fact that decline and hardship has continued for decades in rural Manitoba and that the *stay option* will mean that economic and social opportunities must be provided to rural Manitobans to enable them to live and work there. The citizens of rural Manitoba, indeed, are expected to demand an increasingly greater consideration in the seventies and will not be satisfied with a minimum standard of adequacy, for their life style will be based on a higher standard of living, shorter working hours and the three-four-day week, more leisure time and hence more time for recreation and relaxation, education and intellectual development, and social activities, ease of private modes of transportation all of which will make of them discriminating individuals. As expressed in the *Guidelines* it means that they will require adequate housing, good schools,

¹Gerald Hodge, "Notes On a Set of Principles For Achieving Stability in Small Prairie Communities" (Regina: Urban Planning For Small Communities Seminar at the University of Saskatchewan, Regina Campus, 1972). (Mimeographed.)

²Province of Manitoba, *Guidelines for the Seventies, Introduction and Economic Analysis*, Vol. 1, 1973, p. 13.

meaningful employment opportunities, places to relax and play, events to enjoy, good health care and many other things.³ This has placed increased pressure on both the suprastructural components; the residences, the businesses, the industries, the cultural and recreational facilities, the educational facilities, the health and social services, and the infrastructural components: the public works, the transportation and communications services, the police and fire protection services, and so forth. Certainly, the central business district, hereafter referred to in the abbreviated form CBD, has received the major brunt of this pressure.

The importance of the CBD cannot be overemphasized. The majority of business activity in small urban centres has been concentrated in the CBD. The CBD's importance has originated directly from its centrality --its impact concentration of retail, service and business activity--its focus of the town and region. It has represented major public capital investment in utilities and services and the site of major private investment. Moreover, the CBD has been a major source of public revenue through business and property taxation and the major source of employment and income. Finally, it has been the most prominent feature of the community and a major contributor to its visible image and status.

The central area of small urban centres is beset with serious problems that have been contributing to its decline. It appears to be overzoned, that is, the commercial district is dispersed over too large

³Province of Manitoba, *Guidelines for the Seventies, Regional Perspectives*, Vol. 3, 1973, p. 10.

a land area, thus diluting its effectiveness. In fact it was suspected that the first sign of decentralization is the sprawl of business activity caused by old age and deterioration of buildings, functional obsolescence of buildings, inadequate vehicular circulation and inadequate off-street parking and loading, vehicular-pedestrian conflicts, high cost of land, lack of vitality, and lack of commitment to improvement of the CBD. This has contributed towards its decline in importance, lowering of property values, loss of investments, and competition from outlying shopping centres.

Experience in Manitoba and, for that matter, elsewhere, has indicated that zoning by-laws and development plans are imposed upon the central cores of towns and cities without adequate knowledge of the location, size, and extent of the central business district, and the dynamic aspects of its internal structure.⁴ Consequently, a new understanding of our town centres is required if we are to keep pace with the times, and to come to grips with the more salient forces that are acting upon our communities from without and from within. This study, by an objective, rational approach, will attempt to reduce the element of arbitrariness in planning decisions caused by an excess of subjective deduction.

⁴ Zoning by-laws are legislative tools adopted by local governments to control the use and location of land and buildings. Zoning is adopted in the form of a planning scheme under the provisions of The Planning Act, or a zoning by-law under the provisions of The Municipal Act. It is not development planning. On the other hand, a development plan is a statement of policies and objectives prepared and adopted by local government to establish and effectuate long-range policies. All too often, however, the zoning tool has been used to translate long-range proposals into immediate zoning legislation.

Organization of Thesis

Although planning of the central areas of small urban centres involves due consideration of the total environment, that is, the physical, social and economic environments, and planners must be cognizant of this reality, this study concentrates on the physical environment, particularly the artificial, man-made environment with its structures and hardware that have dramatically altered our natural environment. This study was considered, therefore, in an urban land use planning context with an examination of the physical components of the central area with particular emphasis being directed to the central business district. The study procedure combines theoretical and practical research which involved extensive fieldwork and mapping.

A flow chart of the study process is outlined in Figure 1. The process basically followed five steps:

1. The hypothesis phase--first, the problem perception--a method could be developed for identifying and solving central area planning problems in a comprehensive way from an expressed need for change in the commercial core areas as a result of historic precedent, present demand and projected needs, and second, problem definition--an historical sketch to establish its present status.
2. The analytical phase--a study of pertinent land use theories about the dynamics of the internal structure of a town and its central business district, a review of methods of delimiting its boundaries, and planning and land-use data handling procedures in order that an analytical, theoretical framework could be constructed.
3. The synthesis phase--the construction of a model and the planning technique for applying the model in order that the central business district could be delimited, and the physical deterioration of its structures could be measured.

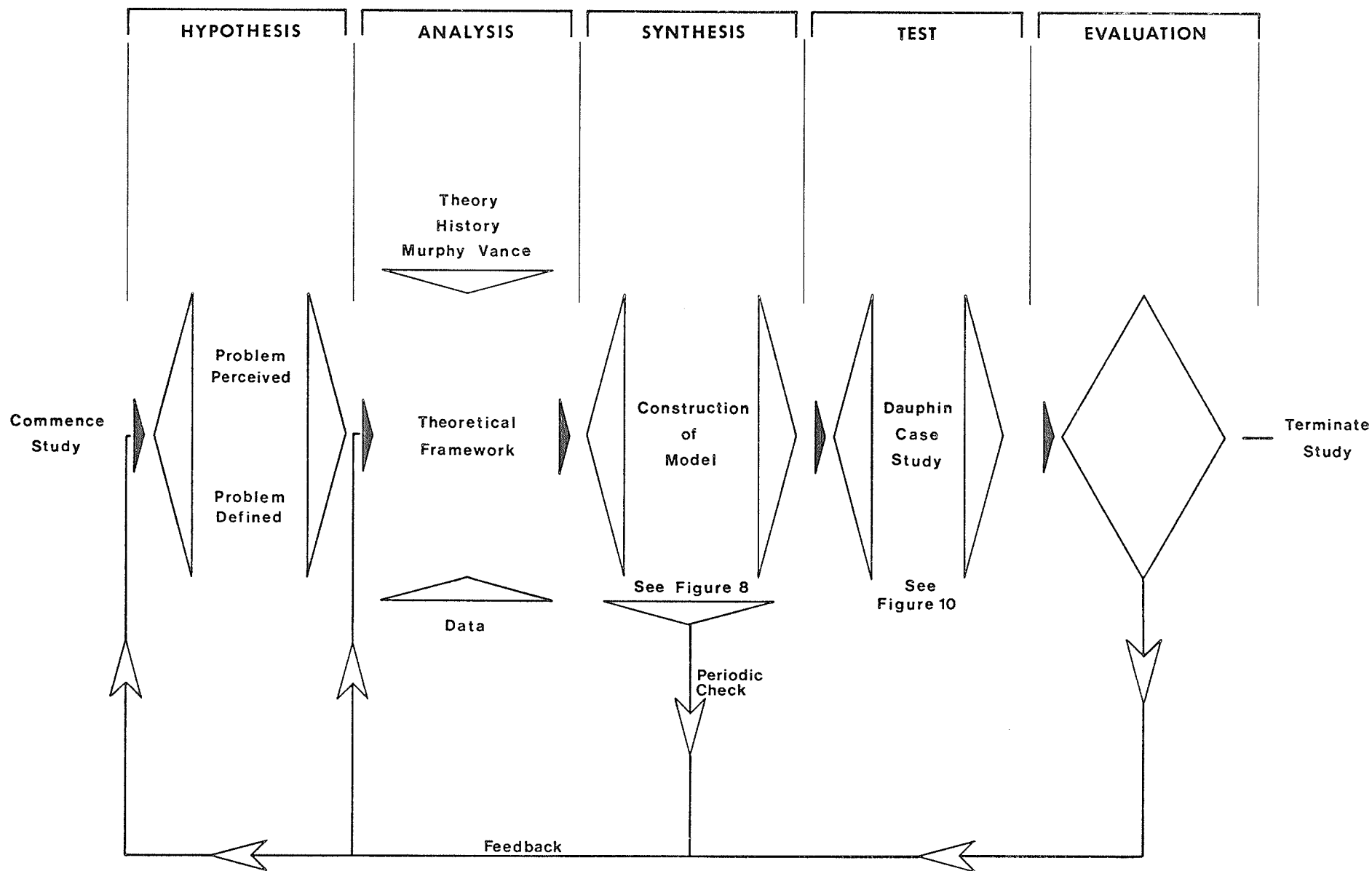


Figure 1
FLOW CHART OF STUDY PROCESS

4. The test phase--the test of the model on the Town of Dauphin, Manitoba.
5. The evaluation phase--the validation or revision of assumed facts, theories, and relationships in order that a planning technique could be formed, broad generalizations about the central business district could be summarized, and the need for further research established.

DEFINING THE PROBLEM

- DEFINITIONS OF TERMS
- HISTORY OF THE PROBLEM
- LIMITATIONS OF PREVIOUS STUDIES
- SUMMARY AND CONCLUSIONS

CHAPTER I

CHAPTER I

DEFINING THE PROBLEM

Although, the problem as perceived has been expressed in the hypothesis, nevertheless, a critical analysis of it cannot be achieved without a broader understanding of its nature. This chapter, therefore, is devoted to problem definition: definitions of terms unique to the study; a review of the history of the problem; and the determination of inadequacies of earlier studies.

Definitions of Terms

Small urban centres. In Manitoba, the inhabitants of any locality, which has a population of more than fifteen hundred inhabitants containing residences of the inhabitants sufficiently close together, may incorporate as a town and the inhabitants of any area, whether comprising the whole or part of a rural municipality, town or village, if they consist of not less than ten thousand persons may incorporate as a city.⁵ Throughout the report of this investigation the term "small urban centre" shall be interpreted as meaning a town that has a population ranging from 1500 - 10,000 persons.

Central area. The "central area" shall be interpreted as being

⁵*The Municipal Act, Statutes of Manitoba, 1970, c.100--Cap. M225, Sections 9(2) and 15.*

a land unit in the centre of a town, large enough in area to encompass the central business district and its fringe, the boundaries of which merge gradually with the adjoining residential areas at its outer edge. Throughout this report, the study area will be the central area.

Central business district. The central business district shall be considered to be the commercial core of an urban centre containing the greatest concentration of office, retail, and business activity, that is, the specialized retail and commercial focus for the town and region.

History of the Problem

An appreciation of the problem cannot be derived without a knowledge of the notion of CBD. Robert E. Dickinson observed that:

Every urban settlement, large or small is in some degree a headquarters of trades and institutions, for the very essence of urban character is the provision of goods and services for a tributary area.⁶

Almost all of this activity has occurred in the central areas of urban settlements, mostly in the CBD, for the CBD contains almost all that matters in the town. The CBD has traditionally been a zone of concentration of commercial activities where most of the civic leadership is found and the activity zone that most unites the community and region.

⁶Robert E. Dickinson, *City and Region* (London: Rutledge and Kegan Paul, 1964), p. 49.

It is therefore the most important zone or activity area in the whole immediate region. Its environment is more than a system of land uses and structures, for it has geographic and social qualities and attributes to which planners must be sensitive. Furthermore, the future of the town to a large extent depends upon the future of its core, for both are inseparable. The town cannot be prosperous without a successful core area, for its deterioration and decline have an adverse effect upon the entire town.

First, the CBD needs to be examined in its historical aspects in order to establish the present status of its problem. Raymond E. Murphy observed that:

It reflects the past in the original site conditions and in changes through time, the present in its response to current economic conditions; and it carries a forecast of the future.⁷

The central area of prairie towns was in the beginning the town itself and has been its most complex and most long-lived part. It is really the only portion of a town that is continually being rebuilt. This makes it the most diverse portion of the town, with a mixture of the old and the new exemplified in architectural styles, landmarks, and so forth. This kind of collection of styles and physical milieu are less prevalent in other parts of the town. Part of the excitement of the CBD is derived from the fact that it reflects the past generations and yet carries a forecast of the future.

⁷Raymond E. Murphy, *The Central Business District* (Chicago and New York: Aldine. Atherton, 1972), p. 63.

Second, the CBD has remained the focus of the transportation network both in-town and inter-town. All types of vehicular traffic such as automobiles, trucks, and buses converge upon the downtown area, making it an area of greatest traffic congestion for vehicles and pedestrians. The problem is that of increasing land values and taxes, together with increasing difficulties of access, resulting in crowding of streets and inadequate parking facilities. Furthermore, inter-town railway lines cut either through the centre of the CBD or pass alongside it. This has been found to be the case in prairie settlements where the railway is of specific importance to the historical development of the town, for it was initially the only means of long-range travel and shipping of farm produce and supplies.

Third, the CBD has long been the commercial hub of the town and has provided the specialized retail focus of the town and region. It contains the majority of professional business offices and other specialized services and has been the major centre of employment.

Fourth, urban planning has been largely land use planning and in the central area the planner has been faced with planning for and within an established area. The CBD fringe, for example, has been an area of adjustment and friction, where blight has occurred due to obsolete residences, rooming houses, low quality industrial establishments, and so forth, where the anticipation of commercial development has seriously inflated the price of land. Since the central area is the oldest part of the community it has been the most subject to obsolescence, deterioration

and decline. The street grid is rigid and difficult to alter, and the railway and railway yards cut a swath through the town, in many cases cutting it in half. Existing planning has been incapable of doing much to improve the area as a physical, social, and economic unit, for it has been difficult to adopt effective land use planning policies and objectives and planning controls in an established area, for planning usually is more effective in new areas where zoning by-laws or planning schemes have not yet been put in effect. The problem is that zoning has been imposed on areas already developed. Moreover, zoning without long-range urban planning is not sufficient to ensure the appropriate use or reuse of land.

Fifth, centrifugal pressure for the establishment of outlying shopping centres has manifested itself, and this phenomenon has added further to the decline of the CBD or has seriously affected the viability of the CBD's of towns. This type of pressure usually occurs in towns where the previously mentioned problems have caused decentralization processes to commence; consequently, a closer look at the adequacy of existing CBD's is required.

Limitations of Previous Studies

The CBD has attracted much research and much literature on it has been published, particularly by urban geographers, social scientists, traffic engineers, and urban planners. Researchers from many countries have studied the characteristics, the internal structure, and the dynamics of the CBD, and have devised methods for delimiting its boundaries on a

map. The urban geographer has delimited the CBD's of various cities basically for comparative purposes in an attempt to arrive at generalizations, and has studied the CBD to gain an insight into its dynamic internal structure; the traffic engineer has studied traffic data and flow for the purpose of solving the problems of routing through traffic to avoid the congested CBD core and to provide for CBD parking for workers and visitors; the economist has studied the urban land market and the economic forces of the CBD; the sociologist has studied the human activities and social attributes of the CBD; and the urban planner has studied the CBD in order to identify and to solve specific planning problems such as are presented by urban renewal.⁸ All the studies have contributed significantly to our basic understanding of the CBD, but many of the previous studies have their limitations, for they are often conceived within the confines of one professional discipline and hence are often too narrow in viewpoint. Although each discipline has its own bias and the planner will lean towards his own specific training and expertise, urban planning is a heuristic process, which requires a probing, systematic approach that will identify and solve a wide range of problems in a comprehensive manner.

⁸ A review of CBD literature has substantiated this generalized statement and the details may be found in the following works: Larry S. Bourne (ed.), *Internal Structure of the City* (Toronto: Oxford University Press, 1971), *passim*; B. Garner, *Models of Urban Geography and Settlement Location*, cited by Richard J. Chorley and Peter Haggett (eds.), *Socio-Economic Models in Geography* (London: Methuen and Co. Ltd., 1968), pp. 335-355; Harold M. Mayor and Clyde F. Kohn, *Readings in Urban Geography* (Chicago: The University of Chicago Press, 1959), Secs. 4 and 13; and Murphy, *op. cit.*, pp. 10-12, and pp. 63-66.

Further limitations of previous CBD studies have been that nearly all available research and literature is devoted to cities in excess of 100,000 population, and although some of the literature is universally applicable to all urban centres, large and small, it was found difficult, if not impossible, to scale down planning criteria for large cities so that they could apply to small centres. In fact Raymond E. Murphy, in conjunction with his delimitation technique, points out that the CBD can hardly be thought of as existing at all in places with a population of less than 50,000.⁹ Nevertheless, all CBD's have displayed a somewhat regular internal structure from city to city and small urban centres have shown a very definite downtown commercial district similar in some ways to the CBD of a large city. More will be written about this aspect in the next chapter where the internal structure of three small centres will be examined.

In Manitoba's case, there has been little previous study to extract from previous CBD research those characteristics, which could be applicable to small urban centres, to examine the internal structure and dynamics of the CBD, and to establish that the CBD of a small urban centre is a definable district.

Summary and Conclusions

It has been established that the central areas of towns and cities represent a tremendous investment of both public and private funds and a

⁹Murphy, p. 124.

tremendous human resource through employment, shopping, and many other activities. This, together with development pressures, has had a decisive impact upon the CBD. The CBD has not been able to keep pace with this activity, for it is beset with structural and functional obsolescence as well as other related problems, which can be thought of in a cause-effect relationship. Although some effects have been observed, succeeding chapters will be devoted to a search for the causes of this phenomenon.

THEORETICAL FRAMEWORK

- **PERTINENT LAND USE THEORIES**
- **HISTORY OF CBD DELIMITATION**
- **THE MURPHY-VANCE DELIMITATION TECHNIQUE**
- **PLANNING AND LAND USE DATA**
- **SUMMARY AND CONCLUSIONS**

CHAPTER II

CHAPTER II

THEORETICAL FRAMEWORK

Pertinent Land Use Theories

Background. In this phase of the study, a body of theoretical knowledge about the CBD had to be assembled that would lead to and form the basis for a comprehensive conceptual structure or chassis upon which the research could be built. The physical and analytical construct was designed to provide for:

1. An examination of pertinent land use theories.
2. A review of the history of CBD delimitation.
3. An analysis of the Murphy-Vance delimitation technique.
4. A summary of the use of basic planning and land use data.

Melville C. Branch's notion of the comprehensive city planning process was deemed to be applicable to the study for he said:

The process of comprehensive planning involves conceptualizing a city from the broad to the particular. Consequently, the decision maker must see the city in its main physical outlines and elements: configuration, general geography and topography, basic transportation network, centers and subcenters of activity, main types and location of land use--as much as he can retain in one coherent, unified image. To this core picturization is tied as much dynamic economic, social, political, quantitative, abstract information of all sorts, and as much detail as the mind can handle and consciously recall.¹⁰

The CBD has been considered an activity system which can be differentiated into sub-systems or sub-activity areas. Murphy termed

¹⁰ Melville C. Branch, *Planning Aspects and Applications* (New York: John Wiley and Sons, Inc., 1966), p. 151.

this as regionalization of the CBD.¹¹ The core area contains the retail district with its stores clustered around this focal point with financial and office districts including highly specialized insurance, bank, and downtown apartments in or near the core area. Murphy observed that as the city increases in size the tendency for internal regionalization increases.¹² However, small urban centres of Manitoba did not exhibit this phenomenon, for various activities were found to be not so extensive that they could be aggregated in groups.¹³

The core-frame concept. Horwood and Boyce developed an interesting structural abstraction of conceptualizing the CBD in their core-frame concept of the CBD.¹⁴ They observed that the CBD is comprised of two parts: a concentrated commercial inner "core" of intensive commercial and business uses and high value land, surrounded by the outer "frame" of semi-intensive mostly non-retail land uses of relatively lower land value, although still high due to the proximity of the central location. In large cities they found that the frame area contains subregions or nodes

¹¹Murphy, *loc. cit.*

¹²Murphy, p. 124.

¹³Observation in the field and examination of land use and property ownership maps and various planning schemes and development plans prepared by the Municipal Planning Branch, indicated this fact.

¹⁴Garner, *op. cit.*, pp. 349-350, and Murphy, *op. cit.*, pp. 112-116, citing Edgar M. Horwood and Ronald R. Boyce, "The CBD Core-Frame Concept", Chap. 2, in their *Studies of the Central Business District and Urban Freeway Development* (Seattle: University of Washington Press, 1959).

of land utilization including transportation terminals, special services such as medical facilities, multi-family residences, auto sales and service, wholesaling/warehousing, and light manufacturing. This does not preclude the existence of sub-activity areas within the inner core as well. The core-frame concept was not a technique for delimiting the CBD but a conceptual structural construct for understanding the central areas of the city. Its application to this study is the notion of a specific core of commercial and business activity surrounded by an area of less concentrated commercial and business activity, an area of transition and deterioration, and an area of older residences and mixed land uses. Its limitation is that no attempt has been made to delimit its outer boundary nor are the subregions or nodes of land utilization in the frame applicable to small urban centres of Manitoba. Some ungrouped activity areas that have limited linkages to the CBD core, however, have been observed in the outer "frame" of the CBD's of towns, including such uses as wholesaling/warehousing, light manufacturing, and institutional establishments.

Urban land use models. Three land use models of city structure have been formulated that are based upon land values and accessibility. These are the concentric zone model proposed by Burgess, the sector model proposed by Hoyt, and the multiple nuclei model of Harris and Ullman. These three models are illustrated in Figure 2.¹⁵ These

¹⁵F. Stuart Chapin, Jr., *Urban Land Use Planning* (Urbana: University of Illinois Press, 1965), pp. 14-15, citing Chauncy D. Harris and Edward L. Ullman, "The Nature of Cities", *The Annals of the American Academy of Political and Social Science*, November, 1945.

concepts have been illustrated in order that they could be applied to three small centres of Manitoba.

In summary, the concentric model was developed on the assumption that land values and accessibility decline with equal regularity in all directions from the central point in the city: therefore, land use patterns are assumed to be arranged in concentric zones about the city centre. However, this is seldom the case, for distortions are created by differential accessibility. The sector model was developed on the assumption that the internal structure of the city is patterned along established transportation routes radiating from the city centre. Differences in accessibility between routes cause changes in the sectoral variation in the land value surface and the arrangement of land uses in sectors. It was developed primarily for the examination of residential land uses within the city. The multiple nuclei model developed on the assumption that land use patterns in most cities are developed around a series of nuclei rather than the single central core of the other two models.¹⁶

Urban centrifugal and centripetal forces. Many researchers have considered the city as a dynamic organism, accompanying growth of its constituent parts either by extension at the periphery or by internal re-arrangement of existing land uses, buildings and structures. Charles

¹⁶B. Garner, *op. cit.*, pp. 338-343, and Chapin, pp. 14-21.

C. Colby stated that:

The modern city is a dynamic organism constantly in process of evolution. This evolution involves both a modification of long-established functions and the addition of new functions.¹⁷

Geographers have recognized three divisions of an urban area, namely, an inner or nuclear zone, a second or middle zone, and an outer or peripheral zone.¹⁸ Urban functions tend to move from one zone of a city to another, and from one part into another part of the same zone. Colby identified two forces at play in this evolutionary process, which he termed centrifugal forces and centripetal forces.¹⁹ Figure 3 schematically illustrates this phenomenon. Centrifugal forces impel functions to move outward from the central zone to the middle zone, the

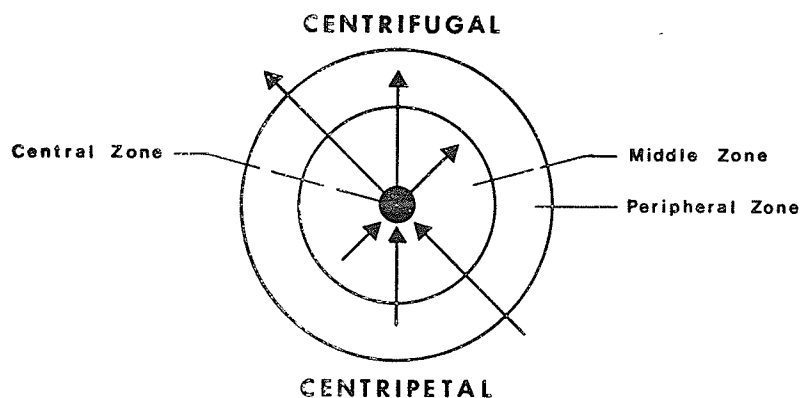


Figure 3

URBAN CENTRIFUGAL AND CENTRIPETAL FORCES

¹⁷ Charles C. Colby, *Centrifugal and Centripetal Forces in Urban Geography*, cited by Harold M. Mayer and Clyde F. Kohn, (eds.), *Readings in Urban Geography* (Chicago: The University of Chicago Press, 1959), p. 287.

¹⁸ Colby, p. 287. ¹⁹ Colby, p. 287.

peripheral zone, or beyond, whereas centripetal forces attract functions to move inward to the periphery, the middle zone, and the central zone, and also hold certain functions in the central zone. Residential and industrial functions tend to be centrifugal in character whereas commercial, retail, and business functions tend to be centripetal in character. Both centrifugal and centripetal forces, therefore, are at work and are coexistent.

James E. Vance observed the seven lives of downtown: the processes of inception, exclusion, segregation, extension, replication, readjustment and redevelopment which he saw occurring through time.²⁰ These processes, particularly those of exclusion, segregation, and extension, manifest these powerful centrifugal and centripetal forces. The process of exclusion operates through the mechanism of rent-paying ability of the function which drives out of the CBD non-central business uses and brings in retail and business uses; the process of segregation, which drives groups of business uses apart; and the process of extension, where business functions grow outwards along arterial routes.²¹

There is evidence that these forces are operational in small urban centres of Manitoba and therefore have to be considered in the study of these communities. Consequently, these forces will be observed in a later section of this chapter.

²⁰James E. Vance, *Focus on Downtown*, cited by Larry S. Bourne, *Internal Structure of the City* (Toronto: University of Toronto, Oxford University Press, 1971), pp. 112-120.

²¹Vance, pp. 114-116.

The peak land value intersection. An understanding of the land value surface of urban centres was necessary in order to understand the internal structure of cities. B. Garner indicated three elements present in the pattern in all cities:

1. land values reach a grand peak in the centre of the city and decrease by varying amounts outward toward the periphery of the urban area;
2. land values are higher along the major traffic arteries than in areas away from them; and
3. local peaks of higher value than the general level at a given distance from the city centre occur at the intersection of major traffic arteries.²²

Murphy stated that the CBD starts at the peak land value intersection referred to in the abbreviated form PLVI.²³ The PLVI has been found to be the point of greatest concentration of retail stores, banks and business offices, where land values per frontage foot average the highest in the urban area. Garner, in his discussion of the urban land market, mentioned that each activity has an ability to derive utility from every site in the urban area, and this utility is measured by the rent that the activity is willing to pay for the use of the site. Competition for use of available sites results in the occupation of each site by the highest and "best" use, which is the use able to derive the greatest utility from the site, and, which is therefore willing to pay most to occupy it.²⁴ This phenomenon is considered a fact in the urban land market. The PLVI

²²Garner, *op. cit.*, p. 336. This is illustrated in Figure 4, and Map 5.

²³Murphy, *op. cit.*, p. 9.

²⁴Garner, *op. cit.*, pp. 335-336.

was therefore determined to be the focal point and heart of the CBD and the most definable portion of the district, for it is located from assessment valuation data, which is available for all urban centres. It is illustrated in Figure 4: the sketch on the left indicates an idealized plan view of the district, and the sketch on the right shows that land values decrease with distance outward from the PLVI except for local peaks at the intersections of major traffic arteries.

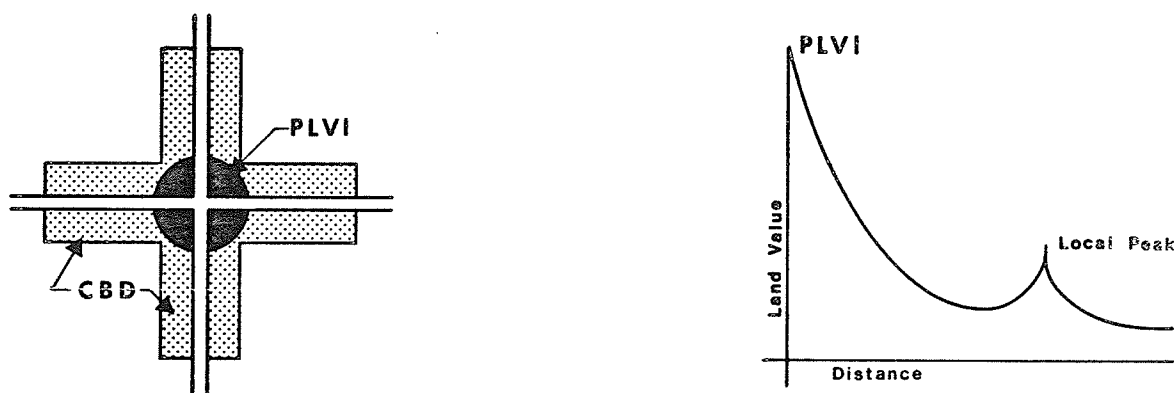


Figure 4.

THE PEAK LAND VALUE INTERSECTION

The internal structure of Manitoba Towns. In order to further understand the internal structure of small urban centres, the previously described theories of urban structure were applied to three Manitoba towns: Roblin with a population of 2000, Swan River with a population of 4000, and Dauphin with a population of 9000.²⁵ Urban land use plans indicating broad patterns of land use were prepared; structural concept

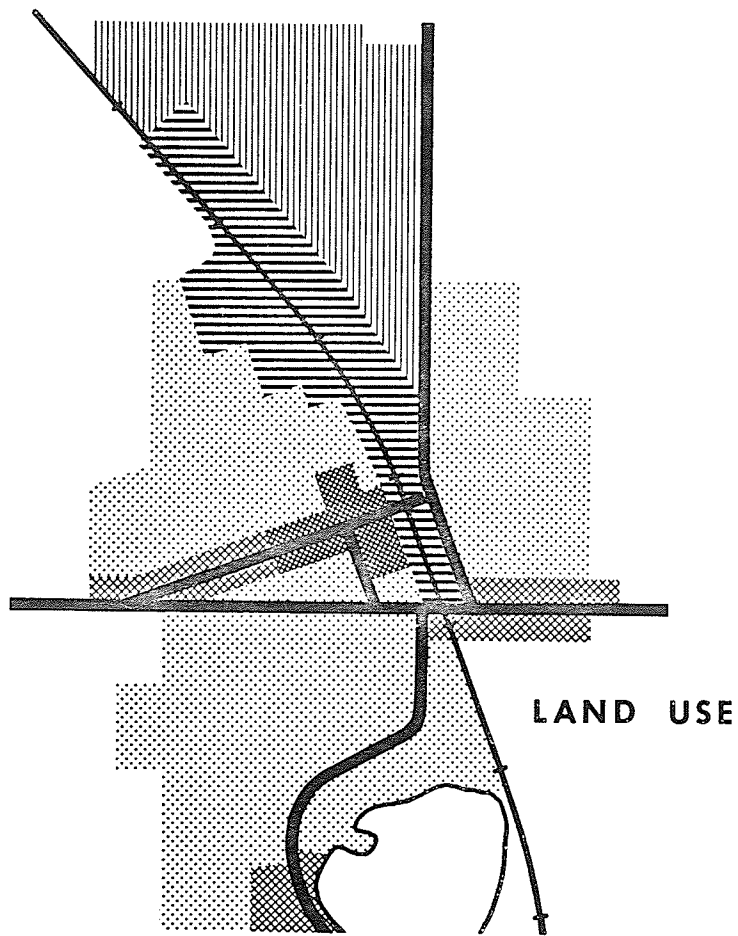
²⁵The population figures are taken from the latest figures of Statistics Canada and are rounded off to the nearest one thousand.

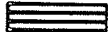
plans based on the urban land use models illustrated in Figure 2, were also prepared; and the PLVI of each centre was located. These constructs are shown in Figures 5, 6, and 7.²⁶

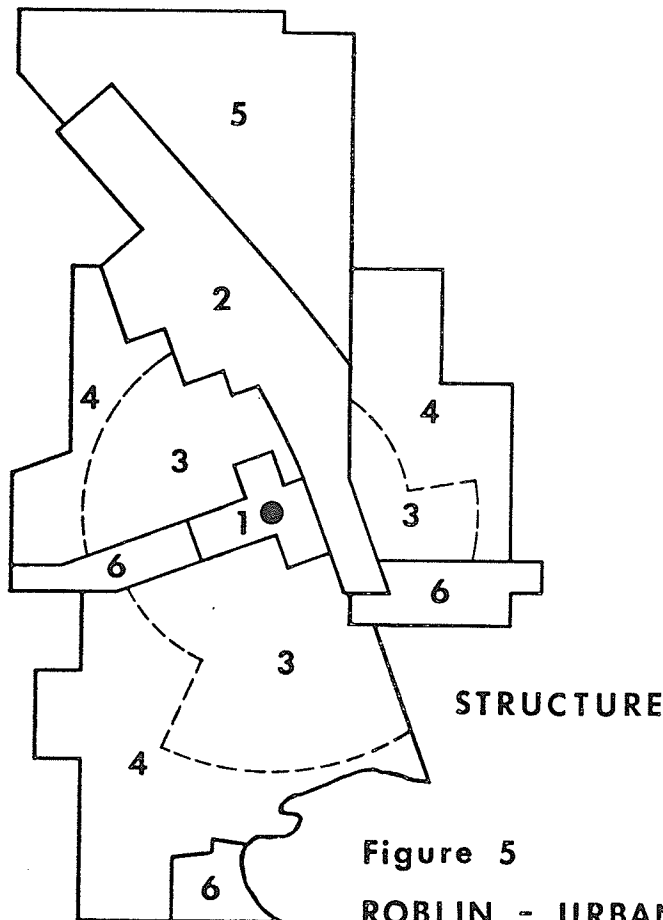
Some idea of the urban land use and structure of Roblin is presented in Figure 5. In applying the urban land use models in Figure 2, six zones were identified in order from the centre outwards: (1) an inner CBD zone surrounding the PLVI and located adjacent to the main railway tracks and away from the inter-town highway routes, (2) a railway industrial zone traversing the town and containing railway tracks, yards, and related industrial activities, (3) an extensive transition zone of mostly old residences and some mixed land uses, (4) an outlying zone of more recent residences, (5) an underdeveloped outlying industrial zone related to rail and highway transportation routes, and (6) an outlying business zone extending in ribbons on routes radiating outwards from the CBD.

Figure 6 illustrates the urban land use and structure of Swan River. In applying the urban land use models of Figure 2, six zones in order from the centre outwards, were identified: (1) an inner CBD zone surrounding the PLVI and located adjacent to the main railway tracks and at the convergence of inter-town radial routes, (2) a railway industrial zone traversing the town and containing railway tracks, yards, and related industrial activities, (3) a transition zone of mostly old residences

²⁶The Figures were compiled from land use information supplied by the Municipal Planning Branch, Department of Municipal Affairs, Province of Manitoba, and by observations in the field.



-  Central Business District
-  Railway Industrial
-  Residential
-  Outlying Industrial
-  Outlying Business



- 1. Central Business District
- 2. Railway Industrial
- 3. Old Residential
- 4. New Residential
- 5. Outlying Industrial
- 6. Outlying Business
-  Peak Land Value Intersection

Figure 5

ROBLIN - URBAN LAND USE AND STRUCTURE

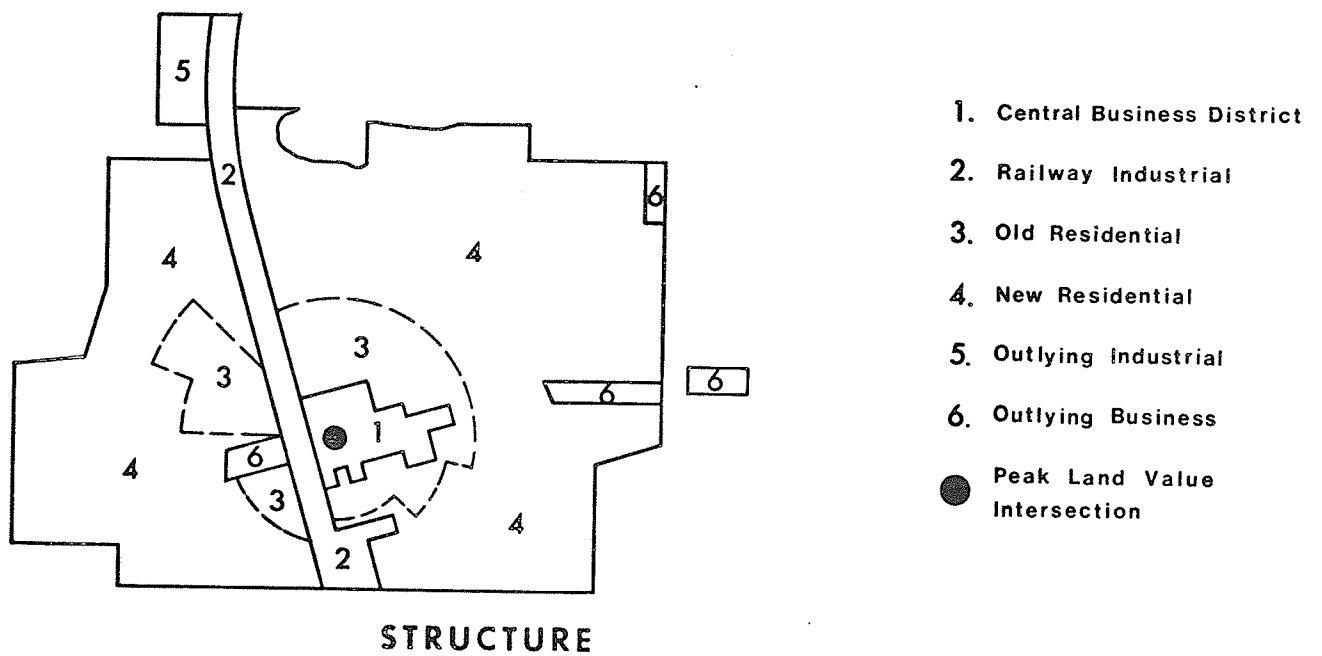
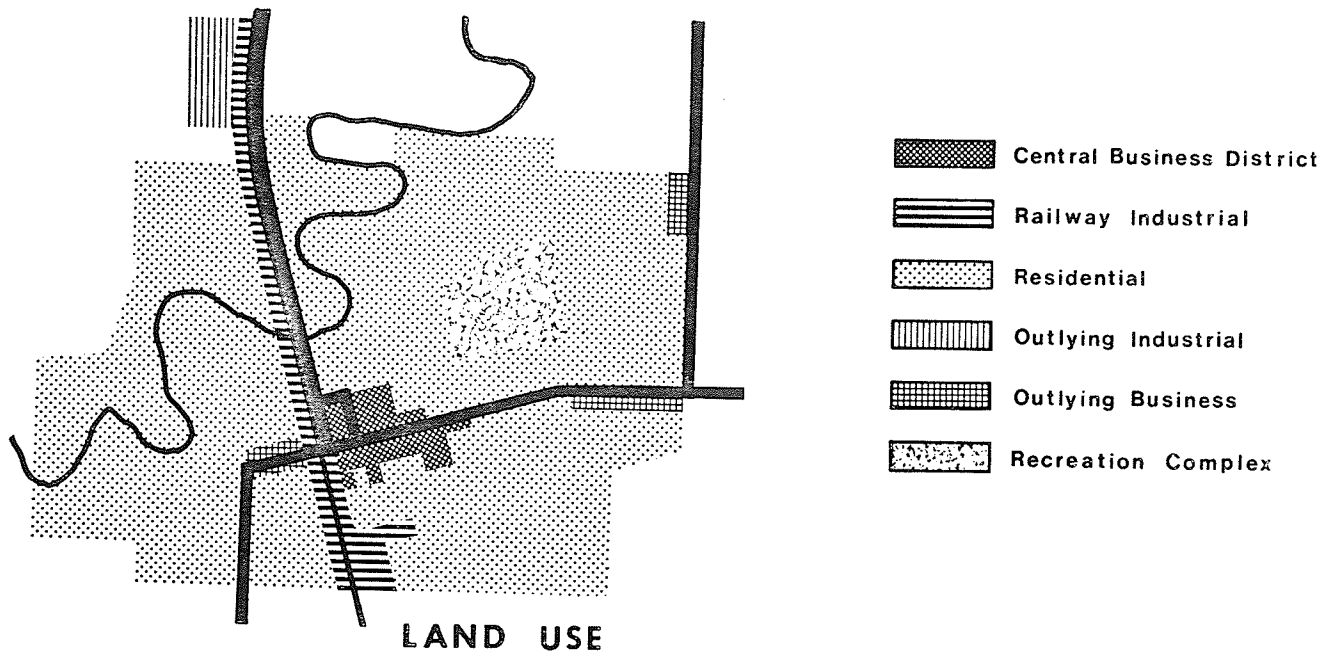


Figure 6

SWAN RIVER - URBAN LAND USE AND STRUCTURE

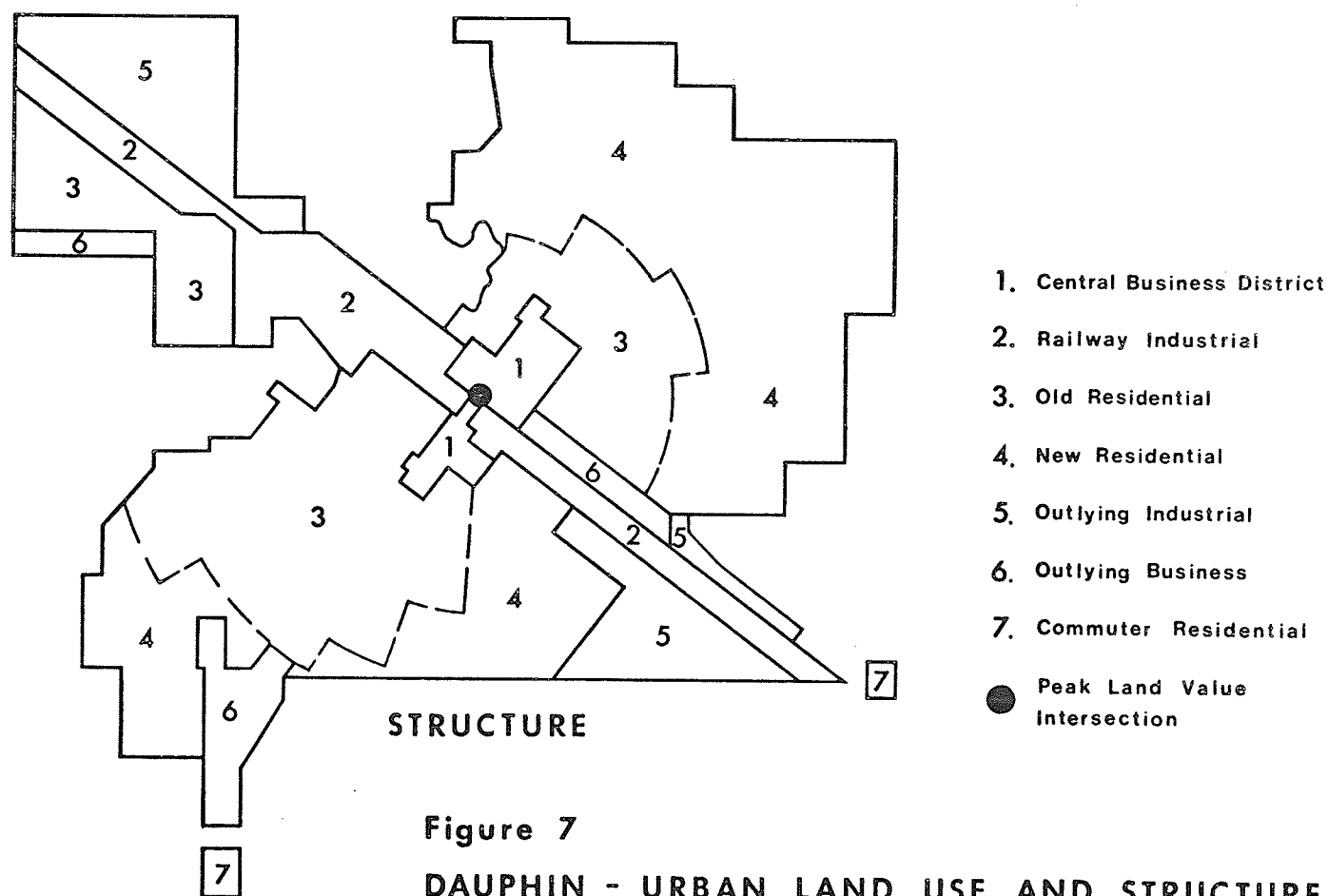
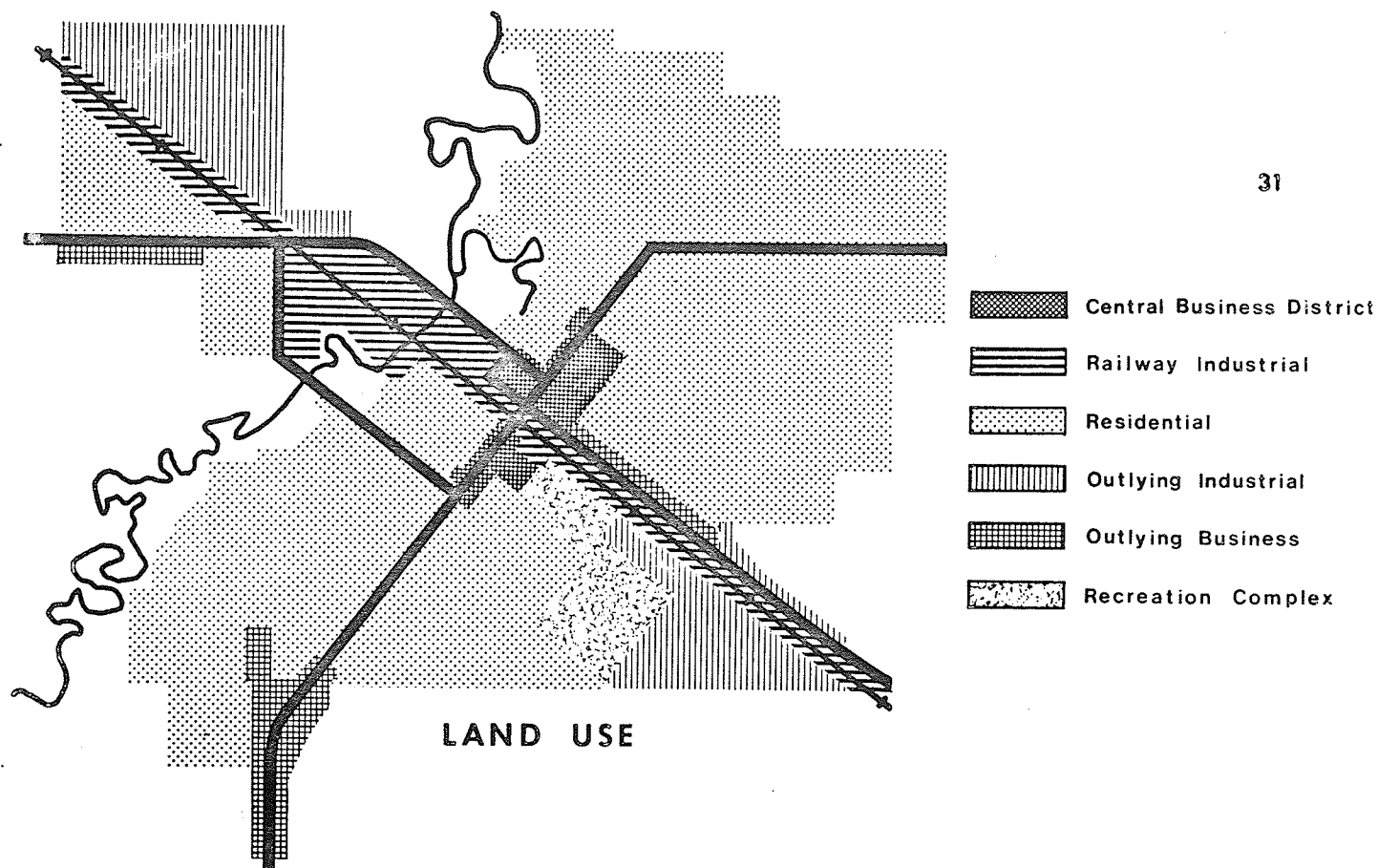


Figure 7

DAUPHIN - URBAN LAND USE AND STRUCTURE

and some mixed land uses, (4) an extensive zone of more recent residences, (5) an outlying heavy industrial zone adjacent to rail and highway transportation routes, and (6) an outlying business zone extending in ribbons on routes radiating outwards from the CBD.

The urban land use and structure of Dauphin is illustrated in Figure 7. An application of the urban land use models of Figure 2 identified seven zones in order from the centre outwards: (1) an inner CBD zone surrounding the PLVI and located on both sides of the railway tracks, (2) a railway industrial zone traversing the town and the CBD and containing railway tracks, yards, and related industrial activities, (3) a transition zone of mostly old residences and some mixed land uses, (4) an outlying zone of more recent residences, (5) an outlying industrial zone in close proximity to rail and highway transportation routes, (6) an outlying business zone extending in ribbons on routes radiating outwards from the CBD, and (7) an embryonic commuter residential zone.

The land use configuration of all three urban centres revealed similar constructs. Commencing at the centre of the town and working outwards, each town had its PLVI surrounded by the CBD zone, an in-town railway industrial zone traversing the town, a surrounding zone of older residences some of which are the original houses of the community, a surrounding zone of newer residences corresponding somewhat to the suburbs of a city, an outlying industrial zone, and an outlying business zone in ribbons of development radiating outwards from the central area.

Furthermore, the largest urban centre has the beginning of an outlying commuter residential zone along two highways.

The ordered land use configuration of these towns outwards from the PLVI has indicated that characteristics of the concentric zone theory are present in town structure. Furthermore, the structural arrangement of industrial and outlying business activities along transportation routes radiating from the centre has revealed that characteristics of the sector theory are also present in town structure. Finally, the emergence of discrete nuclei of residential, industrial, and business activity has revealed that characteristics of the multiple nuclei theory are present in town structure. However, the larger town has a greater number of and more specialized nuclei than the smaller town. There is evidence, therefore, that elements of all three land use patterns are present in small urban centres.

It was postulated that the land use configurations of small urban centres have been caused by centrifugal and centripetal forces. Certainly, this has been inherent in the historical development of towns, for movement has been in two directions: centrifugal forces have impelled residential, industrial, and certain business functions to move outwards from the central area due to need for expansion and need for large tracts of available undeveloped land, whereas centripetal forces have attracted certain commercial, retail, and business functions to move into the central area as well as to retain other functions there.

The internal structure of towns becomes more complex and

diversified with increased size. However, there is a degree of order underlying the land use pattern of small urban centres regardless of size; therefore, it was concluded that the internal structure of small urban centres is sufficiently standard to allow for a planning technique applicable to all small urban centres. Hence, the theories of urban structure will be applied to one town in Chapter IV.

History of CBD Delimitation

A common characteristic of small urban centres has been the fact that nearly all the commercial and business functions of the town and region are concentrated in the CBD. The remainder of commercial and business activity is concentrated along major arterial routes leading from the town, mostly in the form of highway commercial activities catering to the travelling public and needing large tracts of land, or an occasional neighbourhood grocery store. Moreover, the CBD has been considered the heart of the town around which all other activities revolve. It seems reasonable, therefore, to delineate its boundaries on a map. This is deemed essential before an appreciation of its problems could be derived and the dynamic processes identified. In fact, any study involving the CBD cannot be effectively carried out without first-hand knowledge of its location.

In this phase of the study a review of the available literature on CBD delimitation was necessary so that the applicability of previously developed approaches could be assessed. Researchers have developed numerous methods for CBD delimitation and sufficient literature has been

published to permit a candid assessment of the relative advantages and disadvantages of each method.²⁷ Murphy, for example, reviewed eight methods of CBD delimitation: (1) assuming a boundary, (2) volume of trade, (3) building heights, (4) population distribution, (5) pattern of employment, (6) traffic flow and pedestrian counts, (7) valuation data, and (8) land use.²⁸

Assuming a boundary. In this method the CBD is primarily arrived at by intuitive judgement on the part of the local citizenry, elected officials, and planners because of a lack of a method, or because established methods are considered too laborious for calculation purposes. This intuitive process results from the application of local knowledge to urban land use, or the boundaries are defined by zoning by-laws and planning schemes, or by police and fire departments. This method, although useful as a check, was considered too subjective to have real value to this study.

Volume of trade. This refers to the total annual volume of sales for each unit of frontage on a town block with the need for determination

²⁷In tracing the history of CBD delimitation, the work of Raymond E. Murphy and J.E. Vance, Jr., was found invaluable for purposes of this phase of the study. Their contribution is found in the following publications: Raymond E. Murphy and J.E. Vance Jr., *Delimiting the CBD*, reprinted in Harold M. Mayor and Clyde F. Kohn, *Readings in Urban Geography* (Chicago: The University of Chicago Press, 1959), Section 13, and Murphy, *The Central Business District*, Chaps. 2 and 3.

²⁸Murphy, *Delimiting the CBD*, pp. 12-23.

of a lower limit volume of sales value for each block frontage within which the CBD is considered to be located. This method has major shortcomings, for it is difficult and time consuming to obtain trade data from central businesses and it is difficult to quantify volume of trade in dollars and cents for non-retail activities. Also there is a difficulty in attaining candid and reliable information from the merchants who consider such data to be of a personal and confidential nature.

Building heights. The location of the CBD is quickly revealed by observations from the air, or by an examination of aerial photographs because of building heights and concentration of building activity. However, building heights were not deemed a good indicator in small urban centres, as this method yielded very little land use information.

Population distribution. This method relies on the fact that the commercial core area is considered to be devoid of a resident population; therefore, a population dot map of the city would indicate a blank area in that location. This method was quickly abandoned, for a survey of central area residences indicates that a considerable number of persons live there in dwellings above or behind commercial establishments; moreover, a blank area of low population count does not necessarily mean that the area is being used for central business purposes.

Pattern of employment. This technique entails a compilation of information as to the number of persons employed in retail stores, offices and service establishments. This method was considered difficult and

laborious and would require different limiting values for each urban centre because of ethnic, historic, and local differences.

Traffic flow and pedestrian counts. This method requires traffic and pedestrian counts at key intersections within the town, based on the assumption that the highest counts would occur at the PLVI. The CBD would be delimited at a limiting value expressed as a percentage of the highest count. Both traffic flow and pedestrian counts were considered a limited technique for CBD delimitation, for traffic and pedestrian counts are not necessarily related to business activity and again this method lacks land use information.

Valuation data. The idea behind this method is that the CBD is the area of highest land value. Although appraised market value of land is preferred, assessed value will do for it is readily available in all urban centres.²⁹ Furthermore, assessed land value is more useful than assessed building value, for building values can vary substantially in the downtown area, depending on age and condition. A limiting value is usually set for a block by property frontage or average for the block as a percentage of the land value at the PLVI. This method was deemed to have considerable potential worthy of further investigation.³⁰ However, limitations of this

²⁹In Manitoba small urban centres the assessed value of land is about 30 per cent of the market value of land, according to accepted practise of the Municipal Assessment Branch, Department of Municipal Affairs, Province of Manitoba.

³⁰See, for example, Map 5.

technique were considered to be the problem of deciding upon a limiting value of CBD, and the fact that this technique does not reflect building height nor does it reflect land use.

Land use. The lack of pertinent information seemed to be the predominant shortcoming of the previously described methods of CBD delimitation. Yet land use information is readily available in most urban centres.³¹ Therefore, a technique based upon land use was deemed to show much promise for delimitation purposes.³² In the case of Manitoba, observations and experience indicated that the general practise for small urban centres has been to delimit the CBD from the information contained in the land use map and also to base zoning on the land use map. The CBD occurs where the first break in continuity between central business and non-central business uses is observed in streets radiating from the PLVI. A variation of this has been an observation of the establishments at the edge of the district, but this was deemed more applicable to large urban centres, for the edge of the CBD of small urban centres is mainly residential. A further variation of the land use technique which has presented considerable potential is the preparation of street frontage profiles. However, the profiles were deemed difficult to aggregate into an overall plan of the downtown area.

³¹The Municipal Planning Branch, Department of Municipal Affairs, Province of Manitoba, provides a planning service to various Manitoba urban centres. One of the initial services performed for the centre is the preparation of a land use map for the whole urban community.

³²See, for example, Map 4.

The Murphy-Vance Delimitation Technique

The technique. Research into methods of CBD delimitation was not complete without an examination of "The Central Business District Index Technique" of Murphy and Vance, for their method is one of the best techniques developed to date.³³ In summary, the method entails three land use maps of the study area: one for the ground floor, one for the second floor, and one for the upper-floors that represents a generalization of the land use of the third and higher floors. They distinguished between uses that are considered central business and those that are non-central business in character. The final calculations are by block and are based on the amount of space used for central business purposes compared with those used for non-central business purposes. The CBD is defined as consisting of those blocks that meet certain index values and are part of a contiguous group surrounding the PLVI according to set rules. Distinction between central business and non-central business is fundamental to their technique of delimitation. The really essential central business uses were considered to be the retailing of goods and services, financial and office functions and regional offices of utility companies. The non-central uses included wholesaling with stocks, factories, residences, churches, schools, government buildings, parks, organizational establishments, supermarkets, filling stations and

³³ See Murphy, *The Central Business District*, Chap. 3, for a detailed description of the technique.

automobile sales agencies. Some of the non-central business uses were considered either antagonistic to central business uses or neutral.

Murphy and Vance designated on the land use map all central business uses by the letter "C" and all non-central business uses by the letter "X". Actually they prepared a detailed land use plan for their study, which differentiated the central business uses into types of activity, which would be very useful for a spatial or space allocation study for the CBD, but ultimately they integrated land use information into central business and non-central business categories. In any case, the detailed land use map resulted in the same CBD delimitation as if a less detailed land use map had been prepared.³⁴ Profiling was used in the case of buildings containing many stories to make the calculations easier to comprehend. Each building was assumed to occupy its entire lot unless extreme departure from this situation was apparent. Where upper floors occupied much less space than the lot area, an attempt was made to record this. Basement commercial activities were considered negligible.

Murphy and Vance developed two critical ratios:³⁵ (1) the "central business height index" (CBHI) which is the total floor area of central business uses in the block at all levels divided by the total ground floor area; and (2) the "central business intensity index" (CBII) which is the percentage that floor area in central business uses at all levels makes up of the total floor space at all levels. They considered a block as requiring a CBHI of 1 or more and a CBII of 50 percent or

³⁴Murphy, p. 32. ³⁵Murphy, pp. 33-34.

more, and requiring to be part of a contiguous group of blocks around the PLVI to qualify as being CBD. Two indexes were found necessary, for the CBHI alone failed to show the proportion of space in central business uses and the CBII alone failed to take into account the gross amount of central business floor space.

Murphy emphasized that the boundary derived from his technique should be considered a fair approximation of the CBD of a city and that the outer edge of the CBD should be thought of as a zone rather than a line, for the CBD is more a concept than a reality.³⁶ Nevertheless, the technique is realistic and displays opportunity for rapid determination of the CBD, especially by an experienced analyst.

The technique applied. After careful examination of CBD delimitation techniques the Murphy-Vance Central Business District Index Technique was deemed to offer the most objective and realistic method for rapid determination of the CBD of small urban centres. Yet, Murphy doubted whether their method would be applicable to cities in the range to 25,000 population because of severe limitations such as the block unit being too large and the fact that only a few blocks would reach the required index values.³⁷

A study of urban land use maps and preliminary attempts in applying the Murphy-Vance method to small urban centres indicated emphatically

³⁶Murphy, p. 37.

³⁷Murphy, p. 39.

that their technique had severe limitations without modification. Three shortcomings of the method as applied to small centres were observed:³⁸

(1) the town block is too large a unit for its application, (2) certain uses which are non-central business in large cities are central business in small urban centres, and (3) blocks located beyond railway tracks and freeways that meet the index values but are not contiguous with the main CBD blocks are excluded from the CBD.

Planning and Land Use Data

Urban planning has become more quantitative through growing use of numerical data and introduction of large scale information handling procedures and mathematically formulated analytical techniques. Furthermore, the increasing use of models in urban planning has been dominated by two overriding drives: (1) a desire to uncover the dynamics of urban development for its own sake; (2) a desire to explain, anticipate and/or influence the course of urban development for reasons of public or private

³⁸ Preliminary attempts of delimiting the CBD of the Town of Dauphin by the Murphy-Vance method resulted in an error of over fifty per cent in that the blocks within which the sites were located did not meet the required index values; blocks located beyond railway tracks automatically were excluded from the CBD; and uses such as supermarkets, government office buildings and auto sales were considered non-central business. However, observations of small urban centres indicate that railway tracks do not necessarily terminate a CBD, especially if a main street crosses the railway tracks. Furthermore, such uses as supermarkets, government offices and auto sales are considered central business uses, for they serve the whole urban and rural community from a central location.

interest.³⁹

Certainly it is a truism that the urban planner is motivated by one, or the other, or both preceding drives in his planning endeavours. He has also made increasing use of systems analysis with its physical and analytical constructs, data bank and computer services in an attempt to identify and to solve planning problems, for spatial expansion and increased use of land for urban activities requires much information on the use, nonuse and misuse of urban land. A further complication stems from the fact that urban land use planning information represents conditions on a given date, and changes make information progressively less valid unless statistical and graphic information is periodically updated, for a dynamic situation cannot be analysed with static information. More often than not, planning data has become obsolete before a project is completed. As the data base becomes more diverse and complex, the computerized data bank becomes more imperative, if the urban planning process is to be truly comprehensive. A planning and land use data bank at the municipal level that provides for periodic if not continuous data collection, revision, storage and retrieval could make Melvin C. Branch's notion of continuous master city planning a reality.⁴⁰ With the co-operation of the Provincial Municipal Planning and Assessment Branches, Basil Rotoff, in his pilot project for Gimli, Manitoba, recommended a

³⁹ William I. Goodman and Eric C. Freund (eds.), *Principles and Practice of Urban Planning* (Washington, D.C.: International City Managers' Association, 1968), p. 291.

⁴⁰ Melville C. Branch, *City Planning and Aerial Information* (Cambridge, Massachusetts: Harvard University Press, 1971), Chap. 2. In

data bank for computer processing of building and land use data. He stated that much of the tedious work in processing assessment rolls would be eliminated if this data could be retrieved by computer.⁴¹ Although further research is required, this pilot project was deemed to be a significant first step towards a comprehensive total information system made possible by the computer.

Peter Jacobs developed a computer mapping technique known as the grid program,⁴² following many of the procedures developed in the Harvard Graduate School of Design in structuring his data bank for an urban fringe analysis in Halifax, Nova Scotia. He suggested two levels of data bank: the first being a broad and general preliminary survey for activity allocation; the second being more detailed for design development. He also suggested two formats for the processes included in activity allocation: the first being designed to allow a rapid hand-manipulated overview of a study area, especially where a continuously changing data base

this Chapter, Branch introduced the concept of continuous master city planning through extensive use and interpretation of aerial photographs in urban planning. His notion is that the ideal situation would be to have a continuously changing representation of what the city can and intends to carry out with respect to its future. To this end he felt that aerial photographs extensively and systematically used would be the only way of revealing essential physical spatial characteristics through time. The significance of his idea was deemed to be the collection and use of data through time, thus introducing the dynamic element into the planning process.

⁴¹Basil M. Rotoff, *Planning and Land Use Data Bank - A Pilot Project* (Winnipeg: University of Manitoba, 1970), pp. 3 et seqq.

⁴²Peter Jacobs, *Site Planning Process Activity Allocation* (Halifax: Nova Scotia Technical College, 1970), p. 24.

is not expected; the second to involve computer manipulation and print-out of data, based on an analysis model in areas where growth and change is expected to occur with increasing impact.⁴³ He also expressed the opinion that a data bank should be constructed of such units as to allow aggregation to achieve broad pattern analysis and disaggregation to achieve detailed analysis.⁴⁴ He also indicated that the purpose of any data bank is to record only basic units of measurement relevant to the study area, assuming at the same time that secondary measures can be derived from these units.⁴⁵ The data bank therefore has to be structured to be able to receive and process secondary, more detailed information used for detailed design development. The significance of Jacob's contribution was deemed to be the notion that as the urban planning process becomes more complex and dynamic, the computerized data process can be utilized to great advantage.

In conclusion, current land use data is recognized as being the basic source of information and the factual base together with other basic studies and good judgement for sound central area planning. The setting up of a computerized data process for central area planning was considered beyond the scope of this thesis; although perhaps an excellent topic for further research. Hand manipulation of carefully selected data was deemed sufficient for indicating the dynamic structure of the central

⁴³Jacobs, pp. 7-8. ⁴⁴Jacobs, p. 25.

⁴⁵Jacobs, p. 24.

areas of small urban centres, bearing in mind that computerized manipulation of data is essential with the introduction of additional and more complex pieces of information.

Summary and Conclusions

The research of this chapter has presented a relevant body of theoretical information about the internal structure and dynamics of small urban towns and their CBD's. An examination of pertinent land use theories has shown that the internal structure of towns is arranged in an ordered land use configuration outwards from the PLVI of the CBD somewhat similar to the concentric, sector, and multiple nuclei models of internal structure, and that towns have been involved in a process of change and evolution through modification of long-established functions and the establishment of new functions caused by powerful forces that are continuously in a state of conflict--centrifugal forces that impel certain functions to move outwards from the central areas--centripetal forces that attract certain functions into the central areas and hold them there. Moreover, it has been proved that the dynamic internal structure of towns of varying size and location, though differing locally only in detail, is sufficiently standard to attest to the fact that the land use theories are applicable to all small urban centres of Manitoba.

Numerous methods for the delimitation of the CBD have been summarized, one of which is based on land use information which is readily available for all towns. Consequently, the Murphy-Vance

technique, which is based on land use data and two critical central business intensity ratios, was deemed to offer one of the most objective and realistic methods for CBD delimitation, provided that it could be modified to apply to small urban centres.

Land use information obtained through assessment records and observations in the field has been determined as being the basic source of data for urban land use planning. The importance of the computer in handling large amounts of complex data has also been touched upon. This theoretical framework has been constructed to provide the basis for the development of a planning model in the next chapter of this study.

THE PLANNING TECHNIQUE

- PROBLEM DEFINITION
- DATA COLLECTION AND PROCESSING
- ANALYSIS
- SYNTHESIS
- SUMMARY AND CONCLUSIONS

CHAPTER III

CHAPTER III

THE PLANNING TECHNIQUE

The research presented in the preceding chapters has made possible the conceptualization of theoretical knowledge about the internal structure of small urban centres. Moreover, one of the overriding considerations of this investigation has been that a rational empirical method for research and analysis of the CBD and its structure could be formulated which would be of great assistance in overcoming the necessity for complete reliance on subjective deduction, not only by citizens and elected officials, but also by professional planners. Consequently a model, which sets out a planning technique--a step by step procedure in written and graphic form for delimiting the CBD of small urban centres,⁴⁶ and for examining physical deterioration of buildings located in the central areas of small urban centres--has been constructed. A flow chart of the model is presented in Figure 8.

Although there is some overlapping, the model is divided into four distinct phases: (1) problem definition, (2) data collection and processing, (3) analysis, and (4) synthesis. The first application of the model is static, for change through time has not been produced. With provision for periodic updating, however, the model becomes dynamic, for revised

⁴⁶The delimitation of the CBD is the heart of the planning technique, which is an adaptation of the "Central Business Index Technique" of Murphy and Vance.

site and building data are fed back into the data bank that described the initial conditions, and changes may be monitored.

Problem Definition

In towns and small cities of Manitoba, the CBD has been found to be the oldest part of the urban centre and the district most subject to change through a process of redevelopment. Considerable effort by planners and informed civic officials has been devoted to the improvement of the district through total redevelopment, store modernization, store decoration, site and street landscaping and so forth, in an attempt to reverse the trend toward physical deterioration of structures and to cope with centrifugal forces, which have caused a need for expansion of the district. Nevertheless, the CBD has been unable to keep pace with this activity, for it is beset with structural and functional obsolescence, shortage of usable space, inflated land values, central business overzoning, and other related problems. In review, it has been established that zoning by-laws and development projects have been implemented over the central areas of towns without adequate knowledge of the location, size, and extent of the CBD. Therefore, the problem stems from an implied need for a change in central area planning procedures through the development of a planning technique, applicable to small urban centres, for: (1) the delineation of the CBD boundary on a map, and (2) the measurement and evaluation of the physical deterioration of central area buildings.

Data Collection and Processing

Since data collection is a time consuming process, only the most necessary information should be collected. The information has to describe the salient features and facts about the land in the central area, for the study has been conceived in an urban land use planning context. The source of all data is from assessment records and field surveys. Four data categories are required: (1) property ownership data, (2) land use data, (3) land value data, and (4) building data. The data are manually processed, and the mapping of the central area provides the medium for recording and presenting the information.

The mapping procedure is an integral part of the planning technique and is based largely on how the land is used. The area to be mapped must encompass sufficient land around the PLVI to include not only the obvious central business core but also its periphery to its zonal boundary that merges with the adjoining residential district. A scale of 1 inch to 200 feet was selected for mapping purposes because maps of this scale are readily available for Manitoba small urban centres.⁴⁷ A property ownership map was selected as the best map for CBD mapping. This was deemed desirable because property lines encompass each land use unit

⁴⁷ The Municipal Planning Branch, Department of Municipal Affairs, Province of Manitoba, prepares most of their property ownership and land use maps at a scale of 1 inch to 200 feet. Although some maps of 1 inch to 100 feet and 1 inch to 400 feet are available, the larger scale maps are cumbersome to work with and the smaller scale maps lack sufficient detail.

upon which this technique is based. Lot lines, however, could have been used where property lines are more or less coterminous with lot lines. On this property ownership map is recorded all pertinent land use, land value and building data. The basic map, however, is the general land use map, which indicates all the major land use categories, and is used in the preparation of the central business land use map in the next section of this study.

A detailed breakdown of land use which classifies various retail, service, and office functions into functional categories is not required. It must be recognized, however, that an analysis of space needs would require such detail. Furthermore, the land use mapping process must take into account all floor levels with the exception of the basement.⁴⁸ Observations of Manitoba small urban centres revealed that most of the central business uses are located on the ground floor level with some office functions located on the second floor. An exception is the large department store or hotel, which may be three or occasionally four stories in height. Therefore, the ground floor level was selected as the basic plan, requiring, however, notations of upper level activity for those few blocks containing buildings with more than one storey.

⁴⁸Very few central business uses are located at the basement level in towns; although, basements of retail establishments often provide a warehousing function incidental to a retail function. Moreover, retail and business functions generally occur only intermittently in the basement level of CBD's of towns. The basement level, however, of large department stores and the like has to be considered in the calculation of business area. Furthermore, coding of central business uses downwards on the central business land-use map ought to be considered where the basement level is deemed to be equivalent to the second floor.

Analysis

The analysis phase requires: (1) a distinction between central business uses and non-central business uses and the construction of a central business land use map, (2) area and space calculations, (3) central business indexes for block frontage-units for measuring central business space and for measuring central business intensities, and (4) a deterioration matrix to outline physical deterioration of structures.

Central and non-central business uses. Fundamental to the delimitation technique is the distinction between central and non-central business uses, for not all uses represented in the central core are central business in character.⁴⁹ Establishments for the retailing of goods and services, and for various financial and office functions orienting around the PLVI, and serving the entire urban centre and its outlying area, were considered legitimate central business uses. Supermarkets, automobile sales and service establishments, municipal and other government office buildings, including the offices of utility companies, that orient around the PLVI and that serve the entire urban centre, were also included as legitimate central business uses.⁵⁰

⁴⁹Murphy, pp. 24-25.

⁵⁰An examination of land use and property ownership maps and field observations of several Manitoba towns revealed that these uses are located frequently in close proximity to other retail and office functions for convenience of access to banks, hotels, restaurants and professional offices, since most retail and business activity is transacted in the

Non-central business uses do not require a central location and are subject to centrifugal forces which drive such uses to the periphery where large tracts of land are more readily available. These uses are located near railway routes or truck routes rather than in a central location, or contribute little to retail activity, or both. The following uses, therefore, are considered to be non-central business in character: (1) all types of residences, (2) parks, playgrounds, schools, and similar public property, (3) churches and fraternal orders, (4) railway tracks and railway yards, (5) industrial establishments, (6) farm equipment establishments, (7) vacant lots, and (8) vacant buildings.⁵¹

With the assistance of the general land use plan and field observations, the central business land use map is constructed by designating central business uses with the letter "C" and the non-central business uses with the letter "X" for each land use unit of the ground floor plan.⁵² Instead of drawing three land use floor plans such as

central core of small urban centres. These uses can be accommodated in the limited space of the central core. In cities of substantial size, however, these uses are seldom found in the CBD and hence are not central business uses.

⁵¹ See, for example, Murphy, p. 26, for a similar list of non-central business uses. However, farm equipment establishments were added, since in small urban centres of Manitoba such uses are located frequently near the central core, are considered industrial in character, do not require a central location, and serve the rural population more than the urban centre. Wholesaling/warehousing, and commercial storage were considered part of industrial establishments. Newspaper establishments were included with central business uses. The inclusion of all types of residences in this list is not intended to imply that apartment residences ought to be excluded from the CBD.

⁵² Murphy, p. 28.

Murphy and Vance devised for larger cities,⁵³ one land use plan was deemed adequate for small urban centres, provided that a suitable fraction is utilized to represent upper floors. For example, a land use unit with two floors of central business uses is designated "C/C"; two floors of non-central business uses above a central business ground floor is designated "2X/C"; and a ground floor occupied by a central business use, the second floor by a non-central business use, and the third floor by a central business use is designated as a three letter fraction "C/X/C". Every areal land use unit is considered to be one story in height. A commercial parking lot is considered to occupy one story of "C" and a vacant lot as one story of "X".

Area and space calculations. The central business land use map, together with site and building data from assessment records, are the sources of information for the area and space calculations. The ground floor area, the total central business floor area, and the total floor area in all uses are calculated for each land use unit. The floor area of the ground floor is the area of the land use unit and the floor area of upper levels is the total space on those levels. The above areas are aggregated for each block unit, based on street frontage. In small urban centres of Manitoba, town blocks are divided by lanes into two or three frontage-units, although the possibility exists of having as many frontage-units as frontages. Although Murphy and Vance based their

⁵³Murphy, p. 27.

calculations on whole city blocks this was deemed unrealistic, for the town block is too large a unit in small urban centres. For example, many town blocks have extensive business development on only one street frontage, and the remainder of the block is devoted to residential and other non-central business uses. The result is that only a few town blocks would have a sufficient density of business uses to qualify as being CBD.⁵⁴

The central business indexes. The two critical indexes of Murphy and Vance were selected to provide a measurement of the intensity of central business activity. The first ratio is the Central Business Height Index (CBHI), which is obtained by dividing the total floor area of central business uses in the frontage-unit at all levels (the "C" space) by the total ground floor area (CBHI = central business space divided by the total ground floor area). The second ratio is the Central Business Intensity Index (CBII), which is the percentage that floor area in central business uses at all levels (the "C" space) makes up of the total floor area at all levels (CBII = central business space divided by total floor space x 100).⁵⁵

The two ratios were required because the CBHI ratio does not take into account non-central business uses. Thus a frontage-unit could be entirely devoted to central business uses at the ground floor level, yet

⁵⁴ See, for example, footnote 38, of this thesis for further explanation.

⁵⁵ Murphy, pp. 33-34.

it could contain, for example, one or two stories of non-central business residential apartments on the upper level. On the other hand, the CBII ratio takes into account the total floor space of both central business and non-central business uses, yet fails to indicate the gross central business floor space provided by the CBHI.

The rules. The CBD is delimited by the application of the following rules:⁵⁶

1. To be considered part of the CBD, a frontage-unit must have a CBHI of 1 or more and a CBII of 50 per cent or more, and it must be one of a contiguous group of frontage-units surrounding the PLVI that meet the index requirements. Even though frontage-units touch one another only at one corner they are considered to be contiguous.
2. A frontage-unit that does not reach the required index values but is surrounded by frontage-units that do, is considered part of the CBD.
3. Frontage-units located beyond railway tracks and arterial routes that meet index values and are not contiguous with the main CBD frontage-units are included in the CBD provided that a major street from the PLVI provides free access to the main mass of the CBD.

The deterioration matrix. Although physical deterioration is by

⁵⁶Rules 1 and 2 are similar to those established in the Murphy-Vance technique.

no means the only element of the dynamic processes of the central core, it was nevertheless, considered an important factor in the study process. Hence, a deterioration matrix was constructed for measuring the physical deterioration of structures located in the central area. It is illustrated in Figure 9. Deterioration is measured by a windshield survey of building condition,⁵⁷ and is recorded by assigning tone values to five categories ranging from excellent for recent construction with no defects to very poor for buildings beyond repair. The tone values range from light to dark with the worst condition assigned the darkest tone value and the best condition assigned the lightest tone value. When these tone values are applied to a map of the study area the physical deterioration becomes apparent.

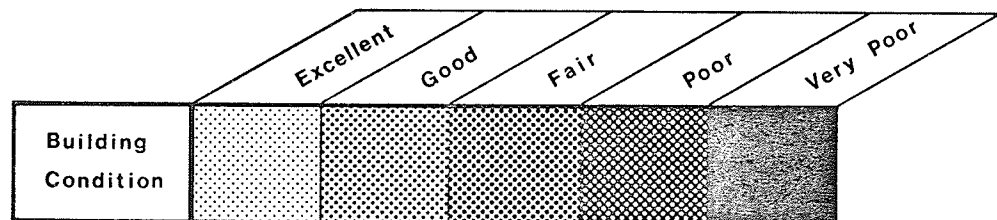


Figure 9

DETERIORATION MATRIX

⁵⁷ A precise survey by a qualified appraiser is not required for purpose of this study.

Synthesis

The first step of the synthesis phase is the delimitation of the CBD. First, the PLVI is determined from land value data and is plotted on a map; second, the CBHI and CBII ratios are calculated for all frontage-units that contain central business uses, and are noted on each frontage-unit of the same map; finally, with the application of the three rules cited on page 58, the district boundaries may be delimited.

The second step of the synthesis phase is the application of the deterioration matrix. With the assistance of building data and field observations, together with the deterioration matrix, each building in the study area is appraised and its condition recorded on a map. This map may be used to assist in determining whether there is a correlation between physical deterioration of buildings and zoning practises. An age-of-building map may also be prepared in order to determine whether there is a correlation between age and condition of buildings. Various building materials have life-expectancies which differ markedly from one another, in many urban contexts; consequently, this fact must be taken into account in the preparation of the condition map.

Summary and Conclusions

A planning model has been described in the preceding pages and has been presented in four stages of development. First, the problem has been defined as an implied need for change in the central area planning process through a planning technique for defining more precisely the

district boundaries of the CBD and for measuring the physical decline of its structures. Second, four categories of data, that is, property ownership, land use, land value, and building data have been established as the basic information for the model and the data are manually processed and recorded through a mapping process. Third, a step by step analysis of data and procedures, preparatory to CBD delimitation and deterioration measurement, has been presented. Finally, synthesis has been an integration step that results in the delimitation of the CBD and the measurement of the deterioration of the district.

It was surmised that an application of the planning technique of the model is a prerequisite to any study involving the commercial core areas of small urban centres. Moreover, a knowledge of the location, size, and extent of the CBD, and a knowledge of the causes of its deterioration would have a marked effect on its future design and redevelopment. However, the next logical step is to test the validity and applicability of the model to a small urban centre. Chapter IV presents this test and its results.

THE CASE STUDY

- THE DELIMITATION OF THE CBD
- TEST OF LIMITING VALUES AND THE FINAL CBD
- THE DETERIORATION OF THE CENTRAL AREA
- SUMMARY AND CONCLUSIONS

CHAPTER IV

CHAPTER IV

THE CASE STUDY

The purpose of the preceding chapters has been the development of a theoretical and practical framework on which a systematic planning technique could be based for the analysis and planning of the central cores of small urban centres of Manitoba. The preceding chapter developed the model for achieving this end. This chapter presents a case study for testing the model and for evaluating the results. The subject of this case study is the Town of Dauphin, Manitoba, which was selected because of its size and importance as a regional service centre.⁵⁸

A flow chart of the case study is presented in Figure 10. It is divided into four phases: (1) the use of the model in the delimitation of the CBD, (2) a test of the limiting values of the CBHI and CBII ratios, and the final delimitation of the CBD, (3) a comparison of the CBD delimited by model with the CBD determined from the land use map, land value map and zoning map, and (4) the use of the model in the preparation of an age-of-building map and condition-of-building map in which the deterioration of the central core is determined and observed. Finally, the more important findings and conclusions have been summarized.

⁵⁸The population of Dauphin is about 9000 and the regional population is about 40,000, according to the latest community data sheets prepared by the Regional Development Branch, Department of Industry and Commerce, Province of Manitoba.

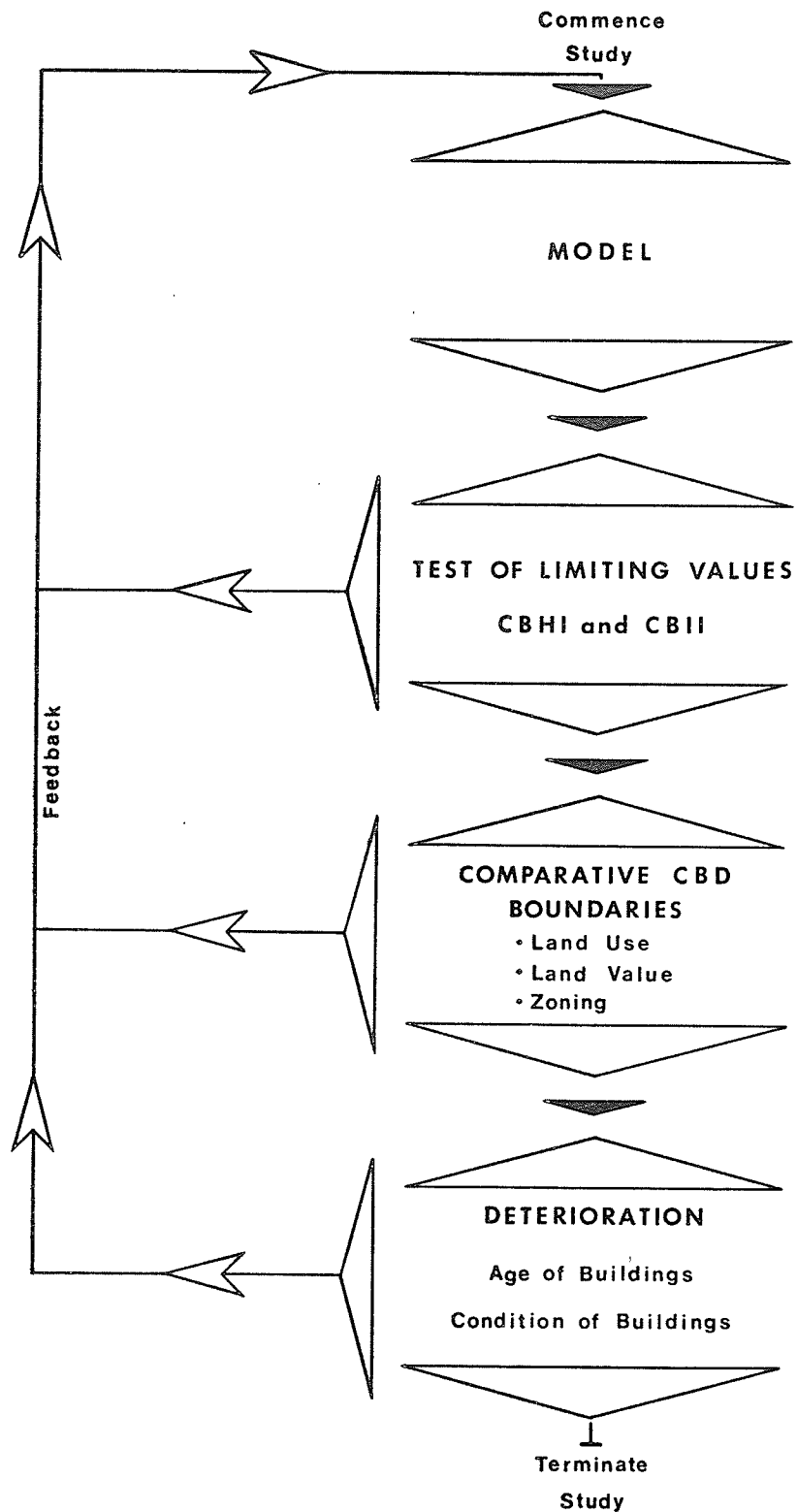


Figure 10
FLOW CHART OF CASE STUDY

The Delimitation of the CBD

Preparation of the base map. A base map modified to show property ownership lines rather than lot lines was drawn at a scale of 1 inch to 200 feet for the study area, that is, the central area of Dauphin.⁵⁹ All of the case study maps are based on this map and in reproduction all maps have been uniformly reduced in scale.

The general land use map. The next step was the drawing of the general land use map which outlines all the major land use categories of the study area.⁶⁰ It was drawn to facilitate the preparation of the next map and is designated Map 1.

The central business land use map. The central business land use map was drawn as an overlay of Map 1, with the application of criteria established in the model concerning central business and non-central business uses.⁶¹ This is illustrated on Map 2.

Area and space calculations. The calculation of area and space involved finding from Map 2, and from assessment records, the ground

⁵⁹ A base map and property ownership map were supplied by the Municipal Planning Branch, Department of Municipal Affairs, Province of Manitoba and were updated from Town assessment records.

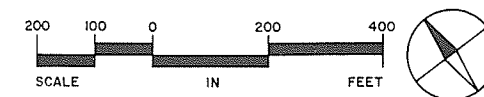
⁶⁰ The Municipal Planning Branch made a land use map available. It was updated by a field check.

⁶¹ See Chap. III, pp. 54-56.

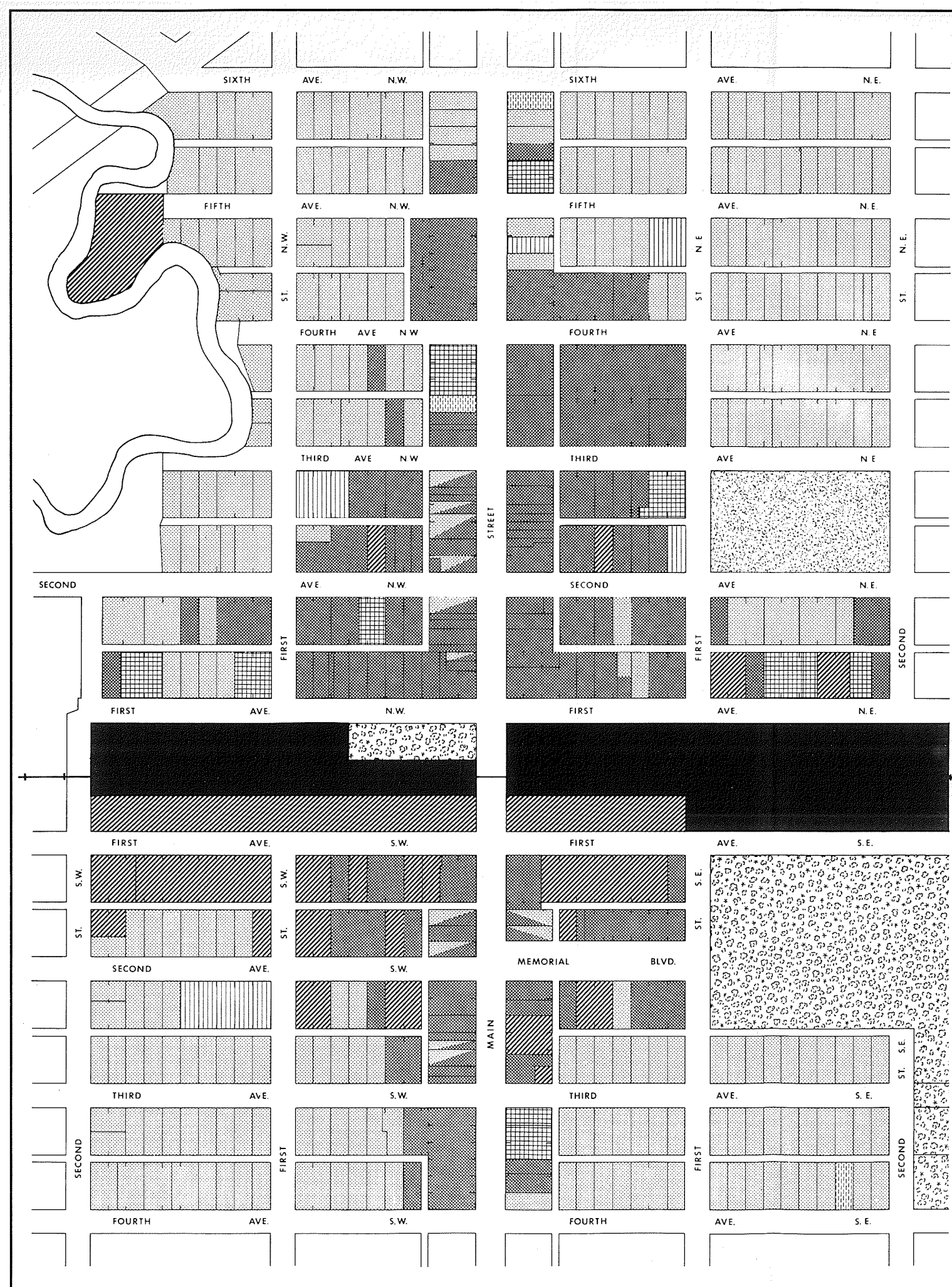
GENERAL
LAND USE

LEGEND:

- Residential
- Commercial
- Industrial
- Parks & Recreation
- Schools
- Public Buildings
- Churches
- Lodges
- Public Utilities



DAUPHIN

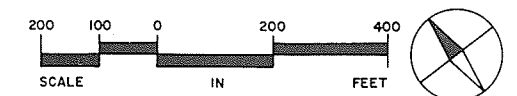


CENTRAL BUSINESS LAND USE

LEGEND:

C..... Central Business

X..... Non Central Business



DAUPHIN

floor area, the total central business floor area, and the total floor area of all uses, for each frontage-unit containing central business land uses. These calculations provided the data for the calculation of the CBHI and CBII ratios for each frontage-unit.⁶²

The delimitation. The delimitation method involved the plotting of the PLVI⁶³; the graphic portrayal of the CBHI and the CBII ratios; and the application of previously established rules.⁶⁴ All this is incorporated into Map 3. The frontage-units that met the required CBHI and the CBII ratios were crosshatched on the map. It was originally intended that the limiting values for the critical ratios would provide the basis for the final delimitation of the CBD. However, some decisions still had to be made before drawing the exact boundary for a number of frontage-units met the required CBII ratio of 50 per cent but failed to meet the required CBHI ratio of 1, and there were irregular cases that had to be considered. Consequently, the fact that some of these frontage-units were close to reaching the limiting values of the indexes, more particularly the CBHI value, led to a test of the validity of these limiting values.

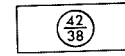
⁶²See Chap. III, pp. 56-58. The areas were calculated from property dimensions and buildings sizes provided by assessment records. Murphy and Vance, however, calculated their indexes from the central business land use maps by scale measurements in square inches. Their method could have been used and is desirable in situations where the calculations become complex, as in large cities.

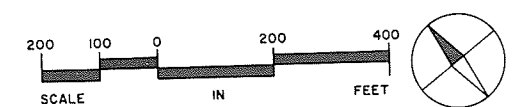
⁶³The PLVI was obtained from assessment valuation data.

⁶⁴These rules are found in Chap. III, p. 58.

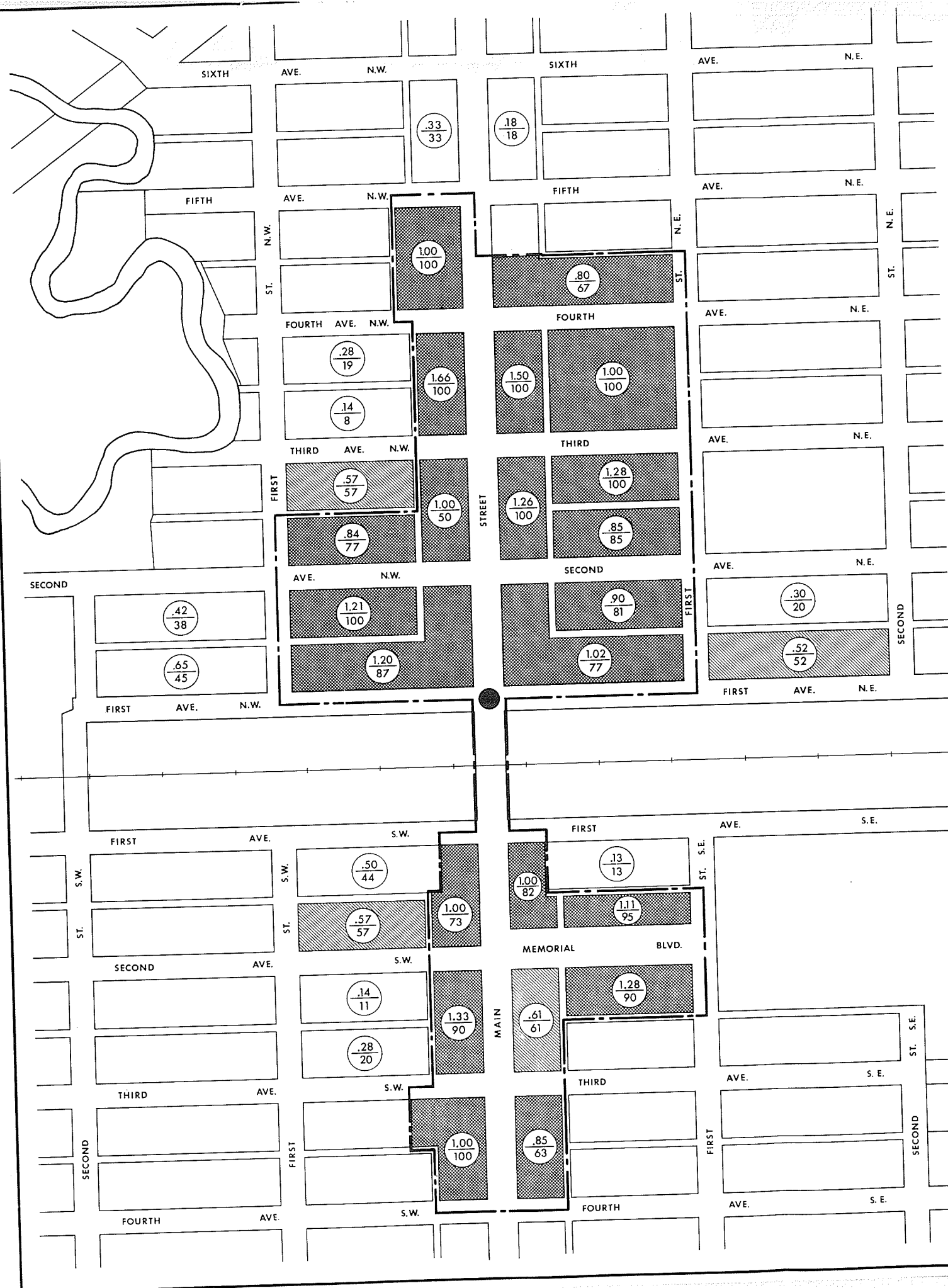
CENTRAL BUSINESS DISTRICT

LEGEND:

- CBHI** Central Business Height Index
- CBII** Central Business Intensity Index
-  CBHI of 0.80 or More
-  CBII of 50 Per Cent or More
-  CBHI of 0.80 or More and CBII of 50 Per Cent or More
-  CBHI of Less than 0.80 and CBII of Less than 50 Per Cent
-  Central Business District Boundary
-  Peak Land Value Intersection



DAUPHIN



Test of Limiting Values and the Final CBD

There are thirty-six frontage-units containing central business uses in the study area. Both the CBHI and the CBII ratios for these frontage-units were ranked and were arranged in separate columns in order of magnitude as presented in Table I. Average values representative of this set of data, which would give a measure of central tendency, were calculated by a statistical approach. Accordingly, the mean and the median values are shown in these results:⁶⁵

	CBHI proportion	CBII percentage
Mean	0.80	64
Median	0.85	70

Based on this measure, the limiting value for the CBHI was reduced from 1.0 to 0.80. This brought five more frontage-units into the CBD. Furthermore, the CBII ratio was left at 50 per cent.⁶⁶

Frontage-units located south of the railway tracks, that is, separated from the main body of the CBD, that met the required index values were included under Rule 3,⁶⁷ because of the major connecting link provided by Main Street. In addition one frontage-unit located in the

⁶⁵The median value is preferred for it is not affected by extreme values. No extreme values, however, were observed in this case study.

⁶⁶All but one of the frontage-units had a CBII index well in excess of 50 per cent; in fact nearly all ratios were greater than the mean and median values. One frontage-unit near the PLVI, however, had a CBII ratio of only 50 per cent and this was attributed to the fact that the ground floor was covered by two floors of central apartment residences.

⁶⁷See, Chap. III, p. 58.

TABLE I
RANK SIZE DATA OF THE CENTRAL BUSINESS INDEXES
FOR DAUPHIN

Rank Number	CBHI Proportion	CBII Percentage
1	0.13	8
2	0.14	11
3	0.14	13
4	0.18	18
5	0.28	19
6	0.28	20
7	0.30	20
8	0.33	33
9	0.42	38
10	0.50	44
11	0.52	45
12	0.57	49
13	0.57	52
14	0.61	57
15	0.65	57
16	0.80	61
17	0.84	63
18	0.85	67
19	0.85	73
20	0.90	77
21	1.00	77
22	1.00	81
23	1.00	82
24	1.00	85
25	1.00	87
26	1.00	90
27	1.02	90
28	1.11	95
29	1.20	100
30	1.21	100
31	1.26	100
32	1.28	100
33	1.28	100
34	1.33	100
35	1.50	100
36	1.66	100

southeast quadrant of the district that did not reach the required index values was included under Rule 2,⁶⁸ because it was surrounded by blocks that did. Finally, the CBD boundary was drawn as presented on Map 3.

The delimited CBD is elongated in the north-south direction because of Main Street, which runs the full length of the district. Main Street is not only central to the district but also the major through route for both in-town and inter-town travel. This strong linear axis links the south side of the railway tracks to the main body of the CBD. This CBD is unique, for most CBD districts in small urban centres in Manitoba are developed on one side of a railway track. The PLVI occurred at the intersection of Main Street and First Avenue (N.E. and N.W.), adjacent to the railway tracks and thus only two street corners contained central business uses. This seemed to substantiate the fact of the central business linkage between the north and the south side of the railway tracks.

Comparative CBD Boundaries

A comparison of the CBD delimited by the model technique with the CBD determined from the land use map, the land value map, and the zoning map was considered essential before conclusions could be drawn about the district. It was hoped that this comparison would reveal further insight into basic knowledge of the district. This has been evaluated and compared in this part of the chapter.

⁶⁸See Chap. III, p. 58.

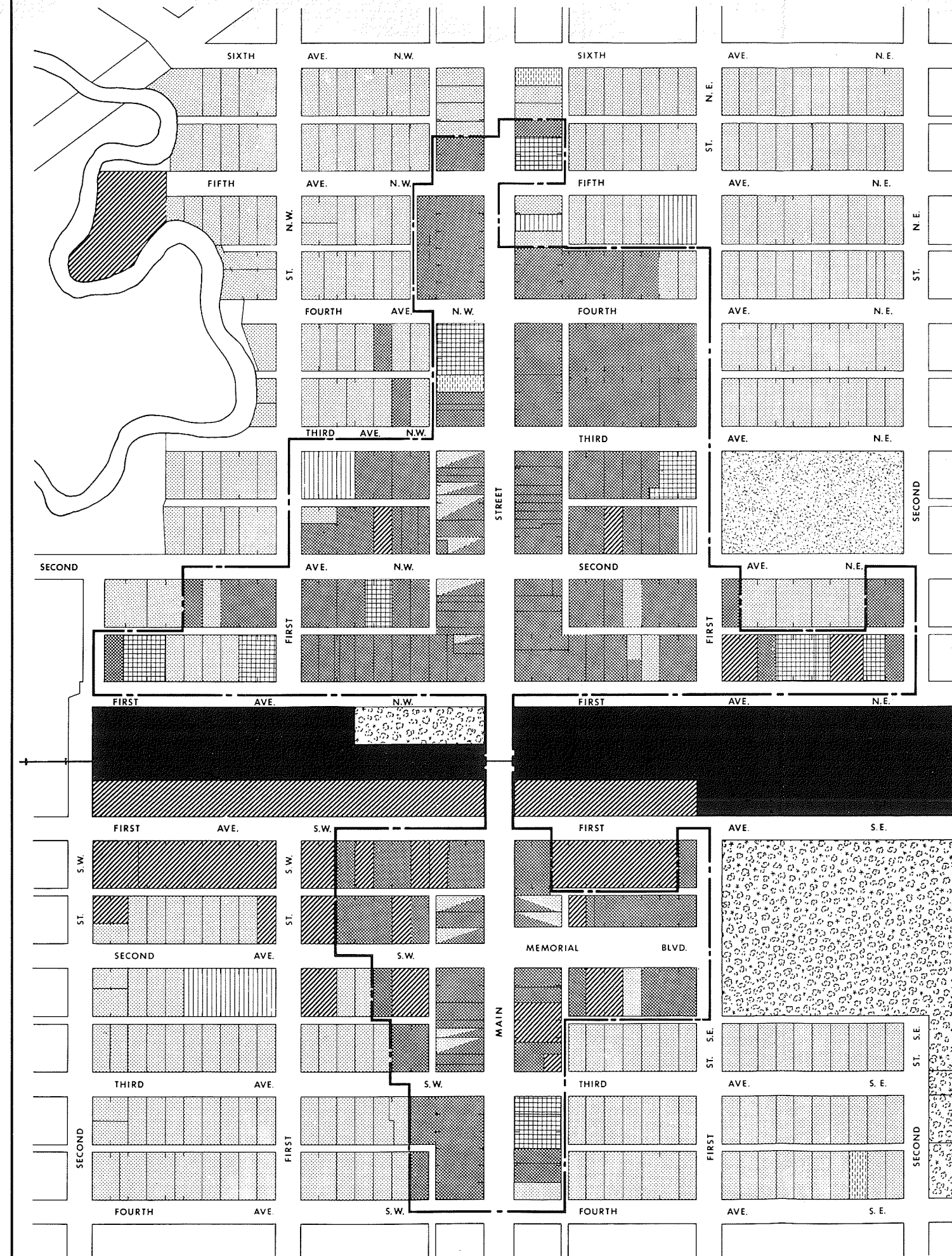
Land use and delimitation. The land use map has been the main source of information, together with informed local opinion, for delimiting the CBD of small urban centres in Manitoba.⁶⁹ The boundaries have been drawn, more for purposes of locating the limits of the central business zoning district, rather than as a conscious effort at delimiting the district. The essence of this method is the delineation, on a map, of the first significant break in continuity of business uses for frontage-units on streets radiating from the PLVI. The key advantage is that the boundaries may be drawn reasonably quickly. The district is drawn on Map 4.

A comparison of Map 4, the CBD delimited by land use, with Map 3, the CBD delimited by the model, revealed a somewhat similar CBD except that the district established by land use criteria extended over a larger area. Entire frontage-units and portions of other frontage-units are included in the district even when few central business uses are located in the block. With their inclusion, however, the district becomes much larger and contains more non-central business uses. There is no measure of central business intensity or density in this method. Yet, this technique is a valid and acceptable method to apply, together with sound judgement, to the delineation of the district.

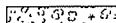
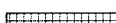
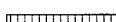
Land value and delimitation. It was mentioned in a preceding chapter that the CBD is the area of highest land value and that this

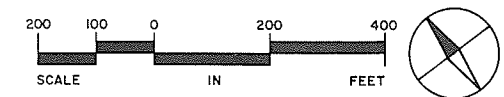
⁶⁹See Chap. II, p. 38.

CBD DELIMITED BY LAND USE



LEGEND:

-  Residential
-  Commercial
-  Industrial
-  Parks & Recreation
-  Schools
-  Public Buildings
-  Churches
-  Lodges
-  Public Utilities
-  CBD Limits



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was worthy of further investigation.⁷⁰ Consequently, a land value map based on assessment valuation data was drawn showing the assessed value in dollars per front foot for the study area, the PLVI, and the CBD based on a break in continuity of land value.⁷¹ This is presented on Map 5.

A comparison of Map 5, the CBD delimited by land value, with Map 3, the CBD delimited by the model, indicated that the CBD established by land value coincides in most aspects with the delimited district of the model, but that the former is larger. For example, frontage-units within the north and west end of the district are high in land value even though they contain a majority of residences. This was conjectured to be caused by inflated land value based upon anticipated business development. On the other hand, industrial uses in a frontage-unit in the southwest part of the district increased its land value. Finally, a frontage-unit located south-east of the district on Memorial Boulevard failed to qualify,⁷² yet it qualified with ease in the model technique. A shortcoming of the method is that it does not discriminate among land uses, it does not reflect building heights, nor does it give any indication of central business intensity or density. Nevertheless, this comparison provides further

⁷⁰See Chap. II, p. 37.

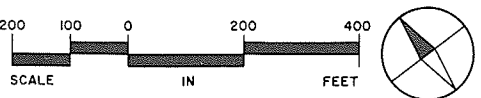
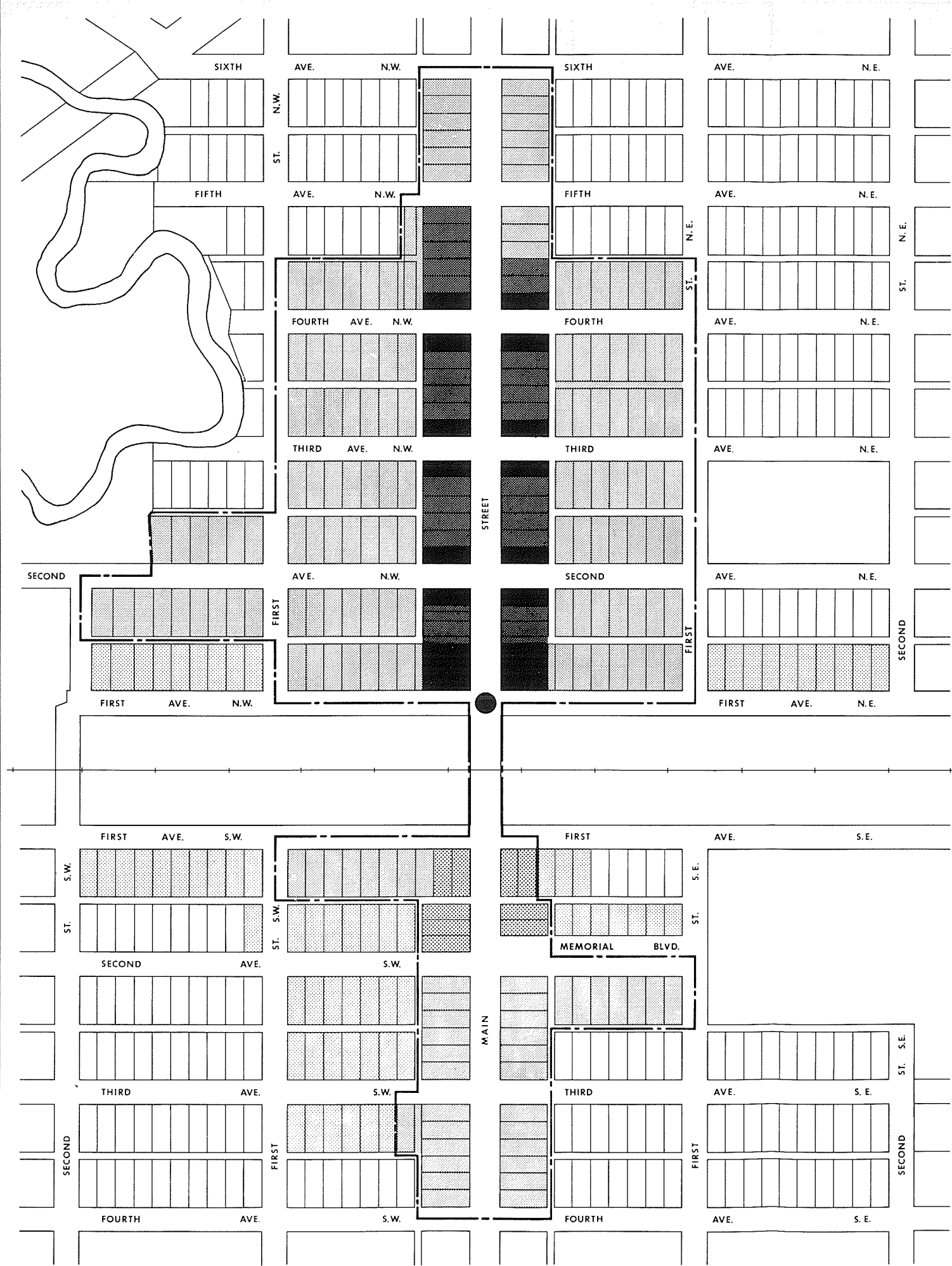
⁷¹This break occurs where there is a sharp reduction in land value from a previous frontage-unit of higher land value. An example of this break occurs where the residential district commences. An assessed land value of forty dollars per front foot was selected as the limiting value.

⁷²This frontage-unit was of lower land value because of lack of site depth.

ASSESSED
LAND VALUE

LEGEND:

- ASSESSED VALUE IN DOLLARS
PER FRONT FOOT
- LESS than 20
 - 20 to 40
 - 40 to 80
 - 80 to 120
 - 120 to 160
 - 160 and MORE
 - Peak Land Value Intersection
 - Central Business District Boundary



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substantiation of the validity of the model technique.

Zoning and delimitation. One of the early assumptions of this thesis was the notion that the CBD's of many towns in Manitoba are overzoned.⁷³ Therefore, a comparison was considered imperative to see if there was any foundation to this assumption. Consequently, a zoning map was prepared for the study area.⁷⁴ It is presented on Map 6. The central commercial district is designated "C2" on the map and is classed as a general commercial district, which is basically derived from the land use map and from the judgement of the local officials. It covers a larger area than that yielded by any of the other methods. This was deemed to be caused by an attempt to zone complete frontage-units to avoid spot zoning of individual business property in those blocks where scattered business activity occurs; an attempt to utilize the zoning tool for long-range development planning;⁷⁵ and a lack of complete knowledge of the location and size of the CBD. Dauphin, in addition to having a large commercial zone, also has a substantial light-industrial district designated "M1" on the map, and containing some business and semi-

⁷³See Introduction, pp. 4-5.

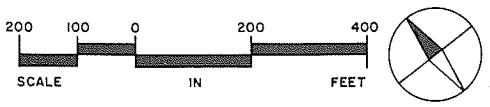
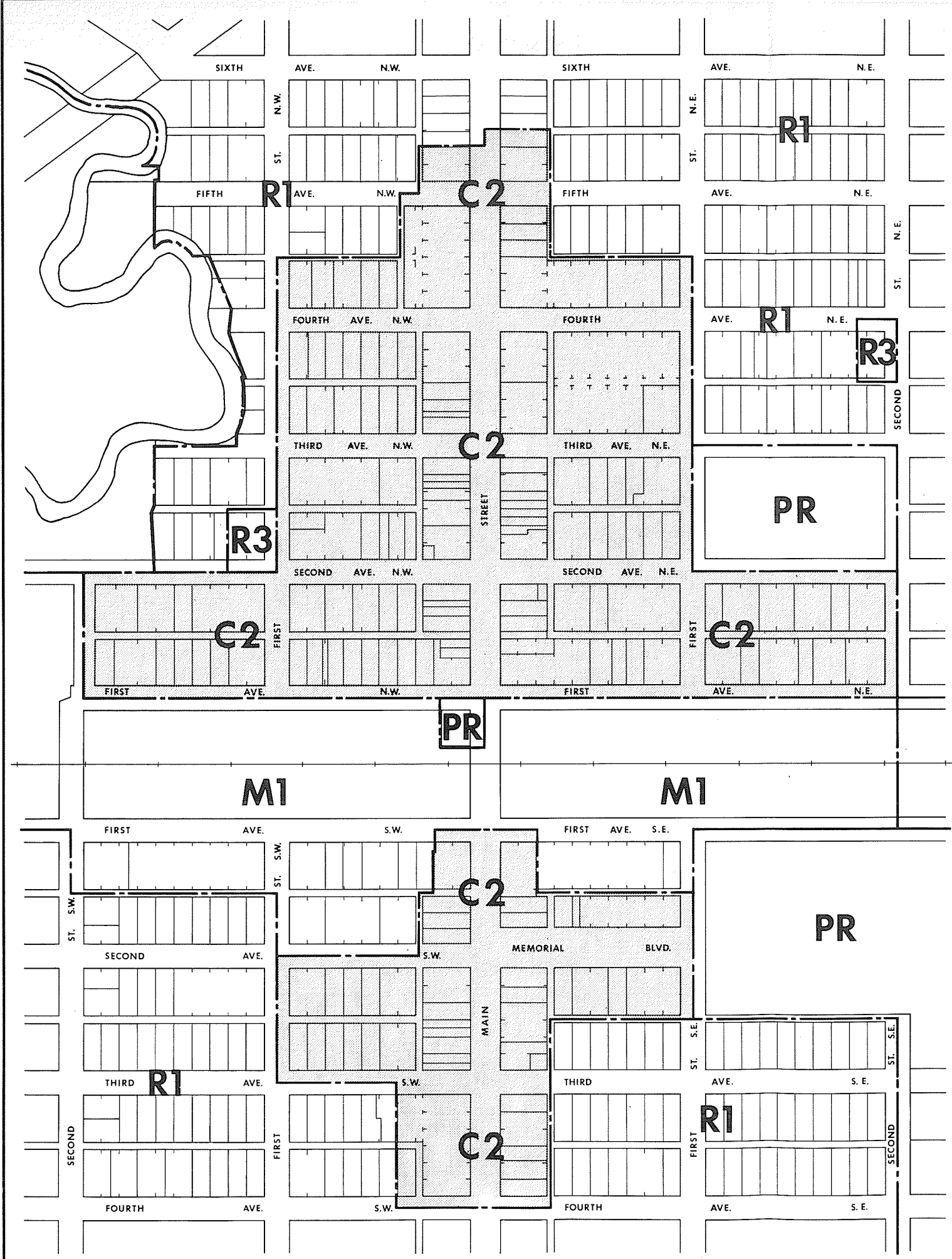
⁷⁴The Town of Dauphin has recently adopted The Dauphin Planning Scheme 1973, one part of which updates the zoning of the central commercial district. The zoning districts are taken from this Scheme.

⁷⁵Whereas zoning is a tool for reflecting what is today and for implementing plans, a development plan is a statement of policies and objectives to guide and to promote orderly development and to establish long-range policies. Towns have used the zoning by-law for long-range planning because of the absence of a long-range development plan.

ZONING

LEGEND:

- R1 Single Family
- R3 Multiple Family
- PR Park and Recreational
- M1 Light Industrial
- C2 General Commercial
- Zoning District Boundary



industrial uses located on railway property and located southwest of the CBD. The extent of the commercial and industrial zoning has had a diluting influence on the effectiveness of the CBD.

The Deterioration of the Central Area

Deterioration of property in the central areas of small urban centres was considered a major problem related to CBD delimitation and extension of the CBD. Consequently, recording and evaluation of its presence were undertaken. Thus, two maps resulted: the first outlines the age-of-buildings and is designated Map 7, and the second outlines building condition by application of the deterioration matrix of the model technique,⁷⁶ and is designated Map 8. An observation of these maps indicates that there appears to be a correlation between age and condition, since old buildings are generally in poor or very poor condition. An exception is the Main Street frontage just north of the PLVI, which was constructed before 1920, yet has been periodically renovated and reconstructed so that these buildings are in fair condition, with more recent construction being in good-to-excellent condition. The buildings of the Main Street frontage south of the tracks, however, have received little attention over the years; thus, they manifest a high degree of physical deterioration.

During the last decade, redevelopment of the CBD has taken place

⁷⁶See Figure 9.

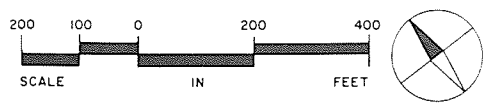
AGE OF BUILDINGS



LEGEND:

CONSTRUCTION DATES:

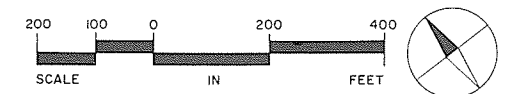
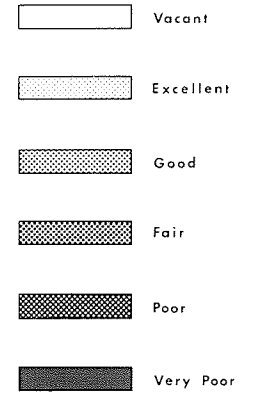
- Before 1920
- 1921 - 1945
- 1946 - 1973
- Vacant Property



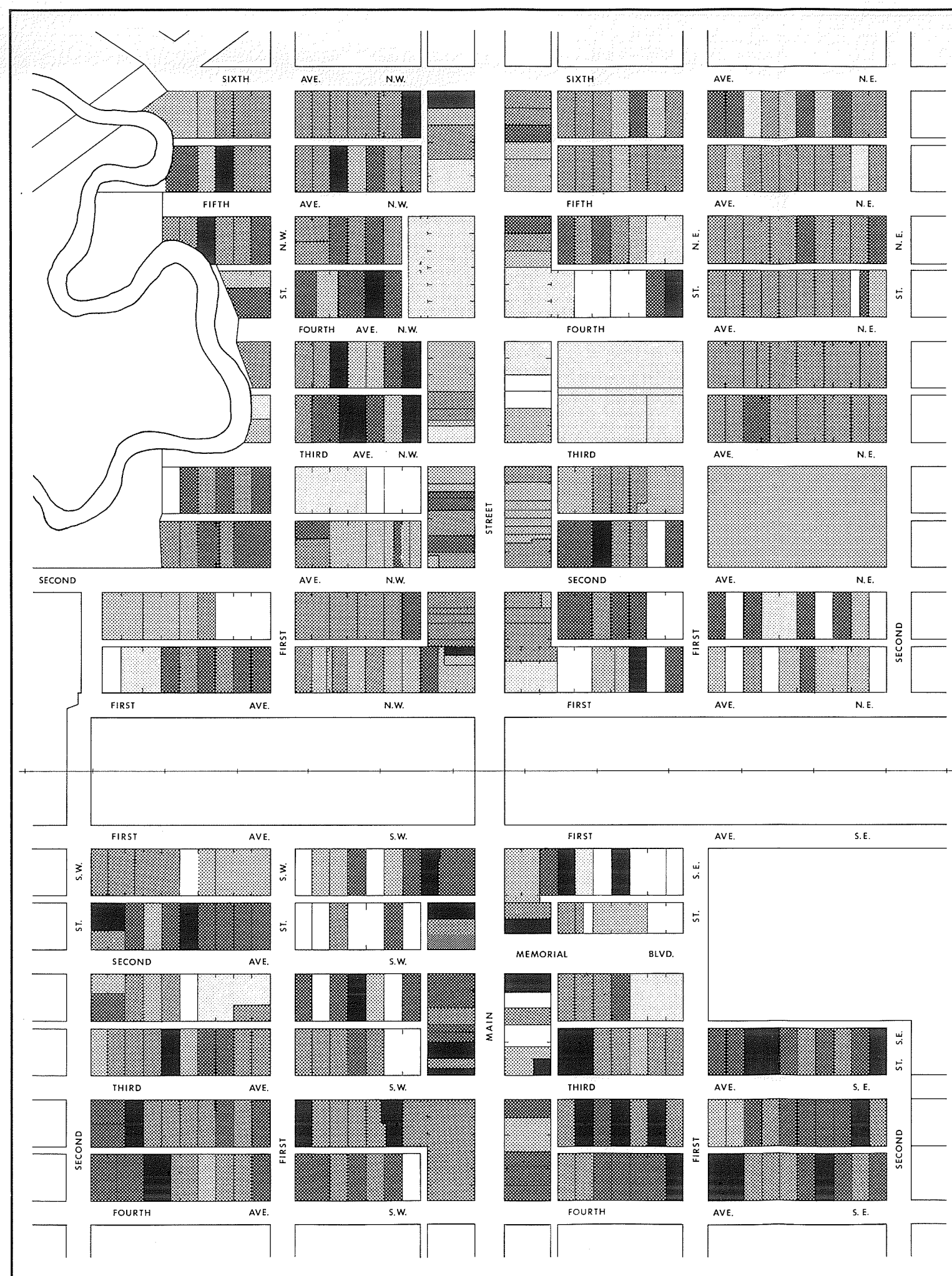
DAUPHIN

BUILDING
CONDITION

LEGEND:



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north of the PLVI, particularly north of Third Avenue, N.W., and Third Avenue N.E.. This was suspected to be the beginning of a shift of the PLVI northward along Main Street and a root cause of physical decline south of the railway tracks. The shift is slow but could accelerate with an increased rate of town expansion.⁷⁷ This movement has also affected the peripheral zone of older residences, certainly those located west of the northwest quadrant of the district. A number of these residences have deteriorated beyond repair. The proximity of this area to the re-developing portion of the district has inflated land value, which has been based upon unrealized expectations. Nor was there any evidence here to indicate any central business potential in the near future. Moreover, the deterioration is further aggravated by overzoning of commercial properties--a practice that does not permit rebuilding of residences other than multiple-family dwellings, the demand for which is limited. Similarly, the structures on the periphery of the south part of the district have deteriorated. This is not surprising, for the overall district is in a state of physical decline. This portion of the district and its periphery contains service-oriented business uses, semi-industrial uses, and industrial uses scattered throughout the area, together with old residences which continue to deteriorate because of zoning practices and unrealized potential.

⁷⁷The "stay option" policy of the Provincial Government places importance on the prevention of people being coerced into moving to large cities for greater social and economic opportunities. Accordingly, together with this policy and a trend to decentralization, the result could be a rapid growth of regional service centres.

Summary and Conclusions

The central theme of this Chapter has been to test and evaluate the applicability of the planning technique developed in the preceding chapter. This was accomplished by its application to a large town, namely, Dauphin, Manitoba. A summary of the more important findings are presented in this section.

The limiting values of the two critical central business district indexes, more particularly the CBHI ratio, were found to be too high when they were applied in the model technique. Their selection was rather subjective, in the first place, for they were used by Murphy and Vance for cities well in excess of 100,000 population. Moreover, there were frontage-units that failed to meet the CBHI ratio that, to an experienced observer, ought to have been included within the CBD boundary for they are central business in character. A statistical approach, however, provided a centrality tendency measurement through the arithmetic mean and median values, which resulted in a lowering of the limiting values for the CBHI ratio resulting in the inclusion of more frontage-units within the CBD boundary. On the other hand, the higher CBII ratio confirmed that a central business intensity of 50 per cent or more was a minimum requirement, since a lower index value would have indicated a predominance of non-central business uses in the frontage-unit.

The division of each town block into smaller units based on street frontages proved effective for overcoming error; otherwise, only Main Street blocks near the PLVI would have qualified as CBD.

A comparative check of the CBD's delimited by land use, land value, and zoning, against the CBD delimited by the model technique, identified what was suspected: the commercial core area is overzoned, thus diluting its effectiveness as a compact and efficient unit. This has created serious problems in adjoining areas where potential central business activity, that may never be realized, has inflated land prices and encouraged obsolescence and degeneration of existing buildings.

A correlation between age-of-building and building condition was observed, as old buildings were as a rule badly deteriorated. An exception was found near the PLVI, where a conscious effort has been made to renew and redevelop property. A relationship between physical decline and zoning practices and development practices was identified: large areas of residential property were zoned for commercial use, thus forbidding the restoration of residences in this zone. Still, the problem has been that it is difficult at the local level to determine the demarcation between central business uses, industrial uses, and residential uses. In fact, there has been a lack of knowledge of the size, the location and the dynamic internal structure of the CBD.

Finally, the division of the CBD into two inter-connected parts separated by the railway tracks and linked by a major arterial street with the PLVI located near the geographic centre of the CBD, was deemed to be a unique situation, since few, if any, other CBD's are divided in this way.

CONCLUSIONS

CONCLUSIONS

The central hypothesis of this thesis has been the belief that a systematic planning technique could be formulated for the development of a more comprehensive approach, for identifying planning problems and solving those problems in the central cores of small urban centres of Manitoba in the population range between 1,500 and 10,000. It has been based on the premise that a new understanding of the CBD is required, in respect to its size, location, density, dynamics and internal structure. The fact is that nearly all available research and literature about the CBD has been devoted to cities in excess of 100,000 population; therefore, this study has extracted from this literature concepts and characteristics that are applicable to small urban towns.

The CBD has been examined in its historical aspects in order to establish the present status of the problem. A body of theoretical knowledge of pertinent land use theories has formed a conceptual framework upon which the research is built. It has been proved that urban centres throughout Manitoba, are dynamic organisms and their internal structures sufficiently standard to allow for a model, which sets out a planning technique, to be constructed.

The planning technique has been divided into two parts: the primary function of the technique is the application of the method for delimiting the CBD. The secondary function of the technique is to apply the deterioration matrix for the measurement of physical deterioration of buildings within the district. A step by step procedure is written and

graphic form has been constructed. The process has been conceived in an urban land use planning context using land use information readily available and obtainable. There has been a deliberate focus of attention on the physical environment of the CBD.

Dauphin was selected as the subject of the case study for the test of the model. The test revealed that the limiting values of the central business indexes used in the delimitation technique had to be adjusted. This was accomplished by a statistical approach for determining a centrality measure of index data. These adjustments had to be tempered with experience, sound judgement and field observations: likewise, adjustments needed to be responsive to local circumstances and to urban centres of varying size. The test also has identified that zoning and development practices are contributing to the deterioration of the CBD and the scattering of business activities, thus resulting in dilution of the district. There is a definite need to reverse this trend by coming to grips with the cause. Future expansion of the district should be in the form of greater utilization of land within its present boundaries and a conscious committed effort towards its consolidation, its conservation, and its renewal.

It has been proved that an empirical method for research and analysis of the CBD can be formulated and that the CBD is a definable district. Furthermore, the CBD boundary should be considered as a fair approximation of its limits and the outer edge as a zone rather than a rigid line. The planning model is not static, for it may be applied

periodically using revised and updated data, thus introducing a dynamic aspect into the process.⁷⁸ Furthermore, a new understanding of the internal structure and dynamics of towns has been achieved.

The technique permits independent researchers, or analysts, to arrive at comparable results in a reasonably objective manner which is of great advantage in situations where there is frequent change in research personnel. Finally, the task can be carried out quickly, especially by an experienced person who needs only to examine doubtful blocks at the periphery of the obvious district. The result is a map showing the delimited CBD with two major central business intensity indicators marked on each frontage-unit.⁷⁹

Further CBD studies are needed. For example, the technique should be applied to a number of towns of varying size in order to determine if these observations are valid; there is also need for comparison studies of CBD's of various small urban centres; and there is a need to examine an urban centre without a railway track crossing the CBD. A further look into physical deterioration is needed, broadening it to include streets, lanes, sidewalks, underground services, and so forth. There is a place for multiple-family dwellings in the central areas of towns, particularly at the edge of the CBD; therefore, further research is needed into this aspect.

⁷⁸ See, for example, Figure 8.

⁷⁹ See, for example, Map 3.

Certainly, detailed land use studies for land use and spatial allocation could logically evolve from this study. There is need to look into the use of the computer technique for CBD analyses--particularly for handling of site and land use data--as larger amounts of and more complex data are obtained. An investigation would be in order to examine the possibilities of computer mapping and the use of aerial photographs in CBD work.

There is also a need to study the quality aspects, for no attention was given to this aspect although tremendous contrasts in quality were observed throughout Dauphin's CBD. The aesthetic aspect needs research as well, for much can be done towards the improvement of the CBD. Architectural-style deterioration may be as important as any other factor, and face-lifting potential needs to be assessed. This can be accomplished through renewal projects and self-improvement projects.

Indeed, all of the above studies could not be effectively accomplished without a knowledge of the size, location, and dynamics of the CBD acquired through this technique for planning central areas. Moreover, its validity and applicability to small urban centres has been established. It is hoped that the subject matter of this thesis will provide useful assistance in the planning process and that it may be utilized beyond the boundaries of Manitoba as well.

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