Planning for Winter Livability in the Resource Sector

Winter Communities No. 2

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by Robert Robson

1987

The Institute of Urban Studies

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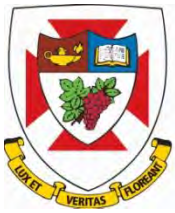

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PLANNING FOR WINTER LIVABILITY IN THE RESOURCE SECTOR

Winter Communities Series No. 2

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Robert Robson

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1.0 INTRODUCTION

This paper, which might be more appropriately entitled "Suburbs Without a Metropolis" or "Wilderness Suburbs," is a critical appraisal of the resource community phenomenon.[1] It does not, in its conclusions, recommend the creation of domed cities, compact land use planning, wind-screen building principles, climate controlled pedestrian walkways, high-density housing or solar access neighbourhood planning, as the optimum winter design solution in the resource sector. Instead, it proposes as a more practical response to the issues of winter livability in the resource sector, the non-permanent community. As argued by J.D. Porteous,

> ...a non-permanent settlement is well adapted for the exploitation of resources with a short working life. It is composed of mobile homes, demountable houses, or specially designed structures which may each be plugged into a central utilities core....[2]

The non-permanent community, the fly-in camp or the short-term residency style townsite, are all not only valid expressions of winter livability but are also the most feasible methods of providing for workers engaged in the exploitation of a non-renewable resource. Although this form of community has been cited elsewhere as a "step backwards" or more pointedly as "an environmental cop-out,"[3] it is, as has been maintained by V.J. Parker, Ira Robinson, Anne Kloppenborg and Colin Bent, a viable approach to community development in the resource sector.[4]

While the non-permanent community is a partial solution to the problems of winter livability in the resource sector, it is not the only solution. In relative terms, the resource town has responded well to the issues of environmental management. This is primarily due to the instant town flavour of the resource community which has allowed planners the opportunity to "plan from the ground up."[5] Whether in the Garden City tradition or through Radburn planning concepts or even the more recent comprehensive planning schedules, resource town planning has incorporated a variety of winter livability programs. In this sense, the greenbelt areas encouraged by the Garden City phenomenon, the neighbourhood units of the Radburn era or the city centre concepts of the comprehensive planning period, are all in part a response to the issues of winter livability. So too is the regional centre approach to community development or the more obvious model winter city designs of

Fermont, Leaf Rapids and Tumbler Ridge. In any event, the evolution of winter city planning in the resource sector follows a long line of planning theory that stretches from the Commission of Conservation in 1909 through to the Polaris Mine project on Little Cornwalis Island in the mid-1980s.

2.0 GARDEN CITY INFLUENCE

Spearheaded by the Commission of Conservation, the garden city movement had a major impact on the evolution of Canadian town planning theory. As articulated by the likes of Thomas Adams, Frank Beer and H.B. Dunnington-Grubb, the garden city approach to community design emphasized the social and environmental issues of urban-rural planning. Defined by Ebenezer Howard as

> ...a town designed for healthy living and industry; of a size that makes possible a full measure of social life, but not larger; surrounded by a rural belt; the whole of the land being in public ownership or held in trust for the community.[6]

The garden city brought to the Canadian planning scene a genuine concern for a healthy living environment. This was echoed in the resource field. Thomas Adams, for example, detailed the pressing need for the resource industries to provide a reasonable "standard of comfort" for their employees.[7] In the extractive industries, Adams noted, that "some mining corporations have recognized the need for improved housing conditions and have laid out and built model villages around their mines."[8] In similar fashion he also suggested that some pulp manufacturers had shown "an enlightened self-interest in planning and developing the towns around their mills so that healthy and attractive housing conditions will be provided."[9] In designing these so-called healthy and attractive atmospheres, consideration was given to environmental planning. In Iroquois Falls, for example, the "Garden of Eden" planning initiative undertaken by the Abitibi Pulp and Paper Company, attempted to provide a degree of protection against the harsh northern Ontario winter for its employees.[10] In this manner, the garden courts, the winding streets and the tree-lined boulevards all indirectly enhanced the winter appeal of the community. Similarly, at Kapuskasing the model town design applied by the provincial government in cooperation with Spruce Falls Pulp and Paper Company and the Kimberly-Clark Corporation, also recognized the significance of environmental planning.[11] The most telling example of the

garden city's environmental thrust, however, occurred at Temiskaming, Quebec. Designed by Adams for the Riordon Pulp and Paper Company, Kipawa-Temiskaming represents the culmination of the garden city initiative in the resource field. In this regard, the townsite plan which was based on several "controlling considerations," measured both the topographical conformation of the site as well as the locations "exposure to sun and prevailing wind."[12] While offering some protection from what Pressman and Xepic call the "hostile climate," the town plan was not so much concerned with climate as with the provision of a healthy living environment.[13]

3.0 **RADBURN INFLUENCE**

Emanating from the United States and articulated most clearly by a combined force of Clarence Stein and Clarence Perry, radburn planning principles eventually came to displace garden city planning theory. This new town philosophy, however, was very much a continuation of the garden city tradition. This was particularly true of the social welfare influence that was seemingly built into both schools of planning thought. The new philosophy centred on three basic pre-conceptions:

1. the Garden City, the main feature of which is a greenbelt around the town

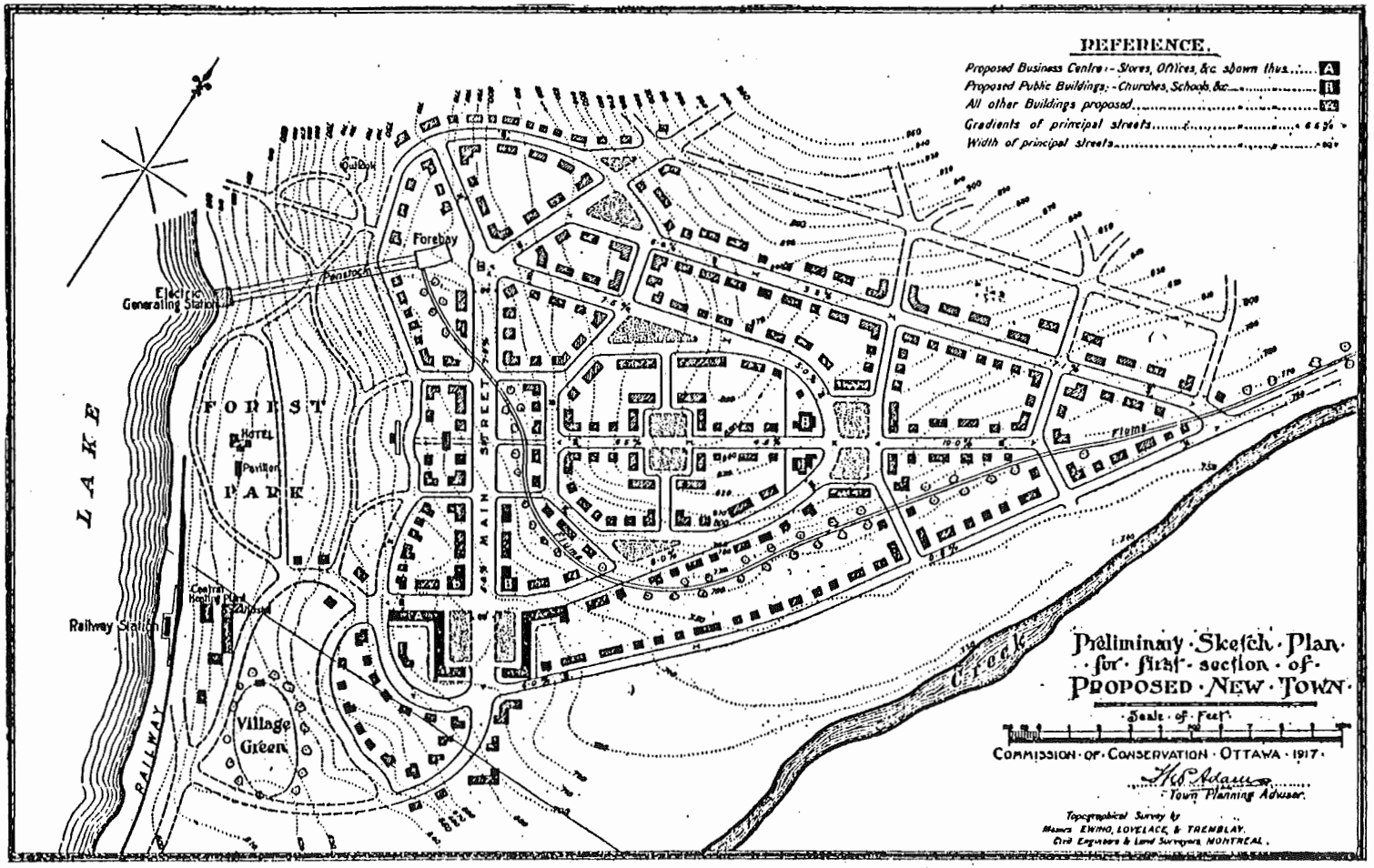
2. the Radburn Idea, which is high-density residences grouped around and facing on to a central, private park, plus segregation of vehicles and pedestrians

3. the Neighbourhood Unit, in which the town would comprise several neighbourhoods each centring on elementary schools and playgrounds, and all would be grouped around a town centre.[14]

Stein, in quoting from Geddes Smith, suggested that the new town of the radburn era was a community "built to live in-today and tomorrow."[15] In this sense the planning philosophy was very much attuned to the needs of modern society. Indeed, in further maintaining that the new town was designed to allow people to "live peacefully with the automobile - or rather in spite of it," Stein vividly captured the central place of the automobile in town planning.[16]

Figure 1

Temiskaming Townsite Map



Source: T. Adams, Rural Planning and Development, Ottawa: Commission of Conservation, 1971.

The essential ingredient of the radburn plan as applied in the resource sector was the neighbourhood unit concept. As argued by S.D. Lash, "most new towns reflect[ed] some attempt at neighbourhood planning."[17] This was particularly true in the resource field, where neighbourhood planning allowed for the staged growth of the community. Whether at Kitimat where the community was intended to consist of twelve neighbourhoods or at Elliot Lake where the initial plan called for the creation of seven neighbourhood units, the concept of neighbourhood planning has readily been applied in the resource community. While this approach to community development has received criticism from a variety of sources, it nonetheless foreshadowed many of the winter city themes now prevalent at the planning level.[18] The clustering of housing, the centrally located park area, the downtown core and the tri-level streetscapes are all in part responses to the problems of climate. At the same time, however, it must be recognized that: the use of cul-de-sacs or loops in residential areas have created problems of snow removal; the neighbourhood park is often a winter-waste land that encourages the drifting of snow and increases wind velocities; even with the clustered housing, single-family dwellings on large lots provide little protection from harsh winter weather; and, finally that the dominate place of the automobile creates problems of parking, snow removal, storage and generally increases the number of open spaces within the townsite. While the neighbourhood unit concept may indeed be the forerunner of the compact land-use scheme, it tended to exacerbate many of the problems associated with the harsh winter climate.

4.0 COMPREHENSIVE PLANNING

The comprehensive planning period has been defined in terms of a growing appreciation "of the value of incorporating comprehensive social and economic principles into the fabric of physical planning."[19] Recognized primarily as a post-World War II phenomenon, the comprehensively planned resource community featured land use segregation, the incorporation of greenbelt areas, the separation of vehicular and pedestrian traffic, an emphasis on environmental management and the implementation of the neighbourhood unit concept. Comprehensive planning, like radburn planning, had its roots in the garden city philosophy of an earlier era and in similar fashion, gives evidence of

the increasing importance of social design in community development. With the passage of time, this slowly came to include features of winter city planning.

Dating from approximately 1945, the comprehensive planning schemes as incorporated in towns like Terrace Bay, Thompson, Deep River, Pinawa or Manitouwadge, provided an elementary level of environmental planning. At Terrace Bay, the Third Interim Report as prepared by E.G. Faludi, gave special consideration to the region's "heavy snow fall and low winter temperatures" as well as to the persistence of "fog on the southern slopes leading down to Lake Superior."[20] At Thompson, while the townsite location left much to be desired, its placement in a slow meander of the Burntwood River afforded some shelter to the community.[21] At Deep River the "village common" or community centre, was located in the shadow of a bowl shaped depression in an effort to provide not only a focal point but also to offer some protection from wind and drifting snow.[22] At Pinawa, the Atomic Energy Commission erected an 18,000 square foot shopping complex to give focus to the community's retail function.[23] At Manitouwadge, the town centre concept was also applied in an attempt to encourage one-stop shopping expeditions.[24] The list of innovative planning goes on and on and ranges in scope from the clustering of trees to the building of massive recreational centres. While the comprehensive planning initiative eventually came to recognize the importance of planning for winter livability it did so almost reluctantly. More and more, however, as the competition for workers intensified, the resource companies adopted a more paternalistic approach to the provision of services. With turnover rates in some cases hovering around three hundred per cent, it became increasingly important for the various resource companies to provide for a minimum standard of comfort. This new initiative often included measures designed to make winter more tolerable.

5.0 REGIONAL CENTRES

By the mid-1960s, a significant shift in policy occurred concerning the creation of resource towns. Visible at both the provincial and federal levels, this changing attitude emphasized a growing appreciation of regional planning objectives. In part a response to the problems of regional

disparity, government policy encouraged the concentration of settlements in large urban centres at the expense of smaller, more specialized, communities. While mostly an economic measure, the "growth-centre approach" could also be viewed as a response to the environmental problems of creating isolated towns in an unfriendly climate.[25] By concentrating facilities in the one regional centre, planners designed community services with not only a view to greater permanence but also in conjunction with an already established urban framework. As argued by A.E. Moss in a paper appropriately titled "Design of Integrated Northern Communities," the many advantages of the regional town concept included:

a) medical, educational, recreational, shopping and other service facilities are greatly improved

b) the presence of a more diversified population makes the town a more interesting and rewarding place in which to live

c) the community is not completely dominated by one company and results in better employer-employee relations.

d) capital costs of townsite construction are shared among several resource companies

e) politically, it is much easier for governments to contribute substantially to providing services for a regional townsite

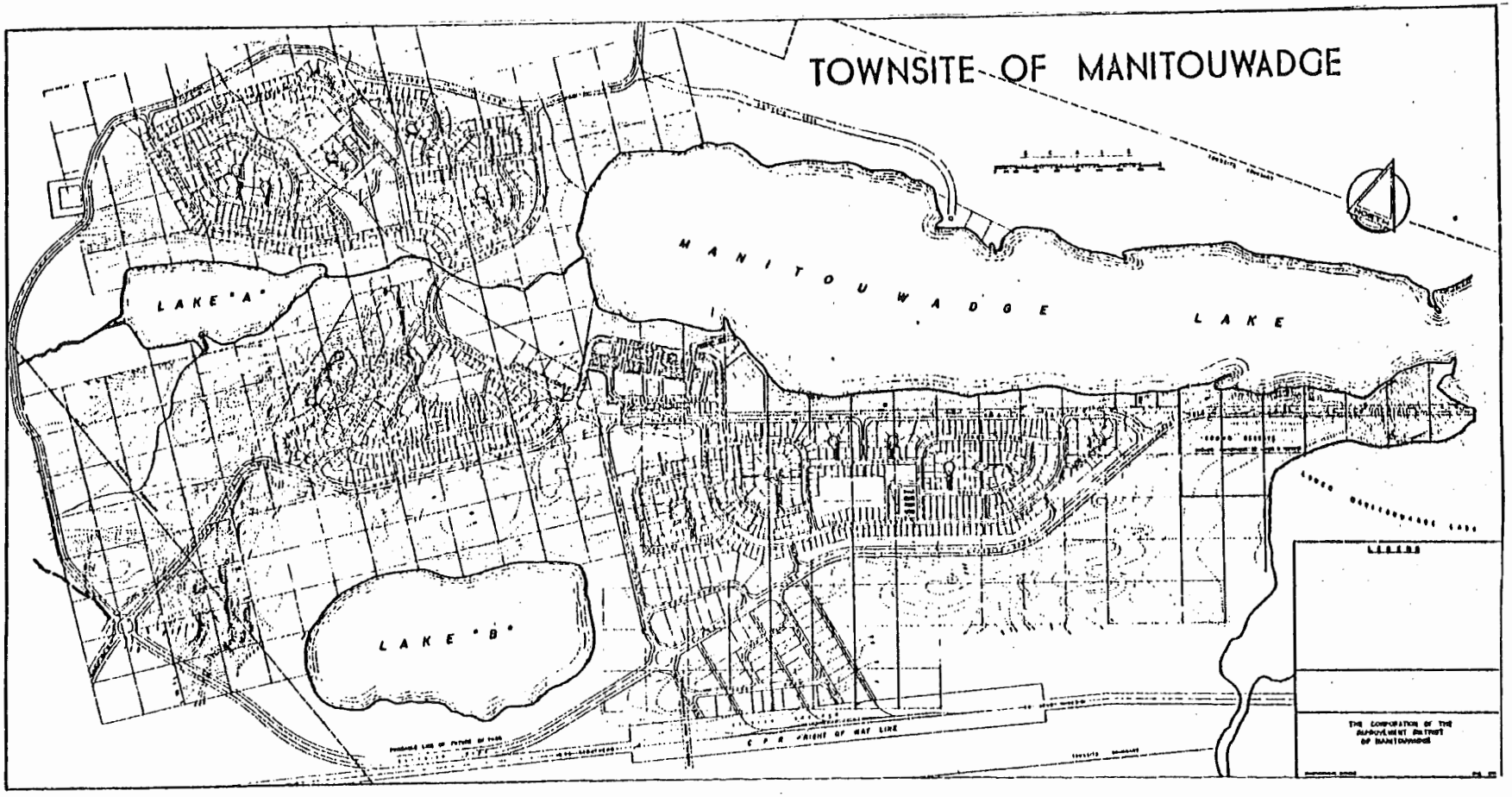
f) the termination of one resource operation, although affecting the town, will not be a disaster.[26]

The zonal complexion of the regional centre concept provides a practical framework for the winter city. Not only does it facilitate quality planning but it also encourages the incorporation of many of the more relevant winter city themes.

When, for example, the community of Elkford became the target area of the Fording Coal Mine project, the Crows Nest Resources' mine at Line Creek and the B.C. Coal Greenhills mine, it was afforded the opportunity to redesign its town centre in keeping with the concept of the town centre complex.[27] Similarly at Manitouwadge, when with the major Hemlo discoveries, the community became the main reception area for the Noranda, Lac Minerals and Teck-Corona mineral operations, the town planned for the development of a town centre complex.[28] Very much in keeping with the traditional multi-function

Figure 4

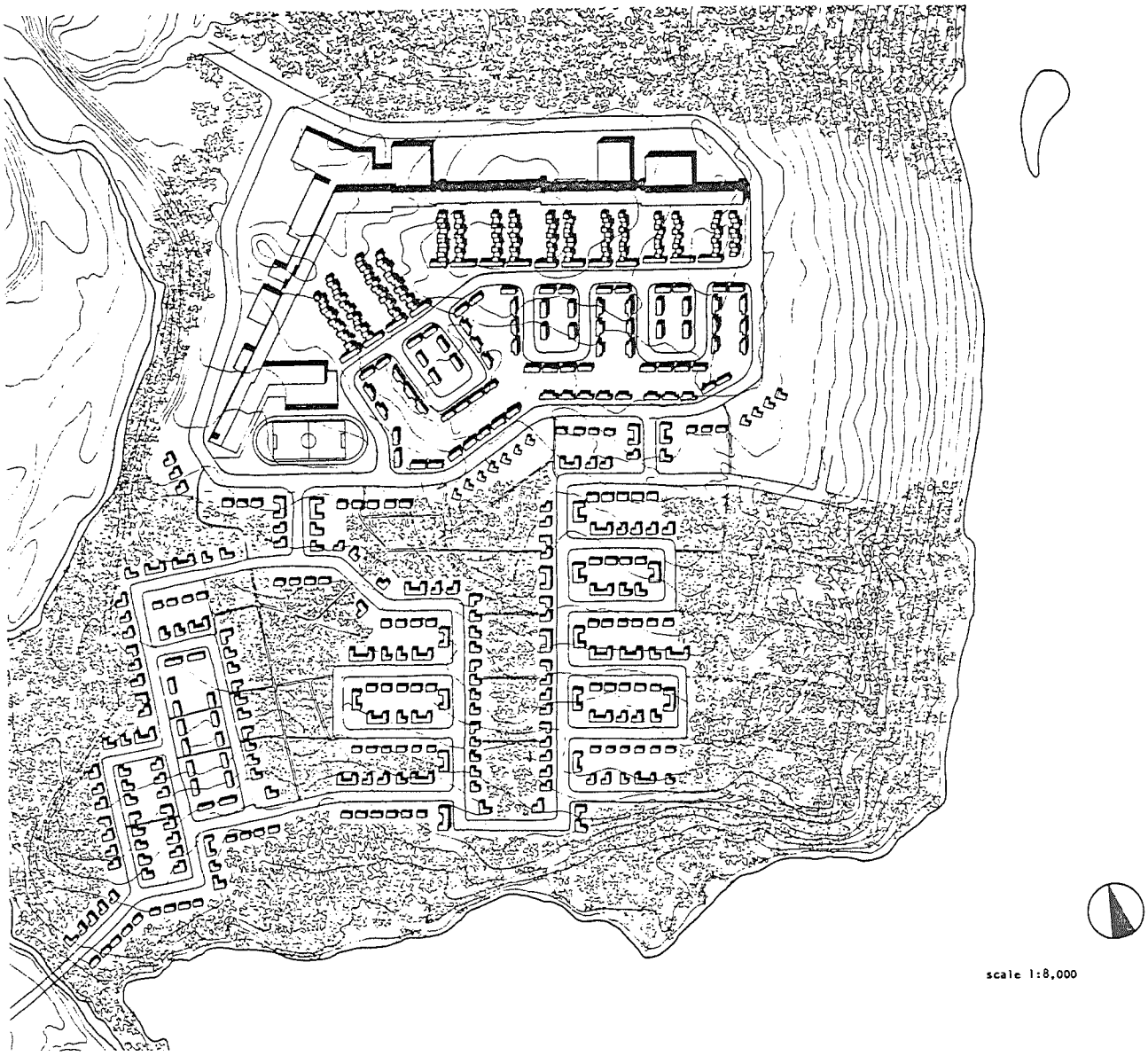
Manitouwadge Townsite Map



Source: O. Saarinen, "Single Sector Communities," in Power and Place, ed. G.A. Stelter and A.F.J. Artibise (Vancouver: University of British Columbia, 1986).

Figure 5

Fermont Townsite Map



Source: B. van Ginkel Associates Ltd., Building in the North: Experiences and Projects, II (March 1976).

town centre, the Hallmarket Square was a modified version of the Hallmark-Hornepayne centre located at Hornepayne, Ontario.[29] Designed by E.L. Balmer of Hallmark Hotels Ltd., the Hallmarket Square will eventually feature 50,000 square feet of retail space and will form the hub of an enclosed, inter-connected downtown centre.[30] According to the long-range plan, climate-controlled walkways will connect the square with low-rise apartment buildings, the Hudson's Bay Company store and a new civic centre consisting of a library, a swimming pool and a hotel. Proposed in an effort to contend with the climate of the north as well as to revitalize the retail function of Manitouwadge, the Hallmarket Square has been described in such glowing terms that some have predicted that it will carry "still further the northern design concepts of the Hallmark-Hornepayne Town Centre and Fermont in Quebec."[31] Indeed, Reeve Sylvio Cortolezzis is quoted as suggesting that the Hallmarket Square is an "important first step towards a more comfortable convenient and attractive town, a livable winter town."[32]

6.0 WINTER CITY PLANNING: FERMONT, LEAF RAPIDS AND TUMBLER RIDGE

Fermont, Quebec is perhaps the most noted resource town planned in the winter city mode. Pressman and Zepic, for example, maintain that of "all new resource communities Fermont is the only one which embodies the design principles for building in the north."[33] It has in many respects become the prototype of the modern resource town. Indeed, one source maintains that Fermont is "the most advanced cold-climate urban design existing anywhere in the world."[34] Featuring compact urban land use, windscreen building principles, climate-controlled pedestrian access ways, the mix of housing types and densities and the solar orientation of building, Fermont appears to be at the forefront of the winter city movement. Best described by design architect Norbert Schoenauer, Fermont offers "a mileau for voluntary social interaction...in harmony with the realities of a sub-Arctic region."[35]

The community of Fermont was designed and constructed in conjunction with the iron-ore operation of the Quebec Cartier Mining Company. Initiated in 1969 when the ore value of the Mount Wright iron mine was determined to be of such a value as to warrant community development, Fermont from the outset was

designed in harmony with the northern environment. The winter city design concept which was prepared by the architectural firm of Desnoyers and Schoenauer, was approved by the mining firm in April of 1970.[36] Construction of the project commenced in the summer of 1971, with some residents taking up occupancy as early as the fall of 1972. Built for approximately 6,000 inhabitants, the construction stage was completed in 1976 and Fermont quickly took on an air of permanence.[37]

The compact land-use pattern as applied in Fermont called for a density of 26.3 persons per area.[38] The so-called "immense natural landscape" precluded the development of a low density townsite. The advantages of the compact design were defined by Schoenauer in a paper entitled "New Town and Climatic Factors" as threefold:

(i) shorter walking distance between the built-up areas and the surrounding landscape and within the build-up areas

(ii) reduced capital costs resulting from short access routes. Capital costs include such items as paved roadways, curbs, sidewalks, sewers, storm sewers, water mains, street lighting, hydrants and power distribution.

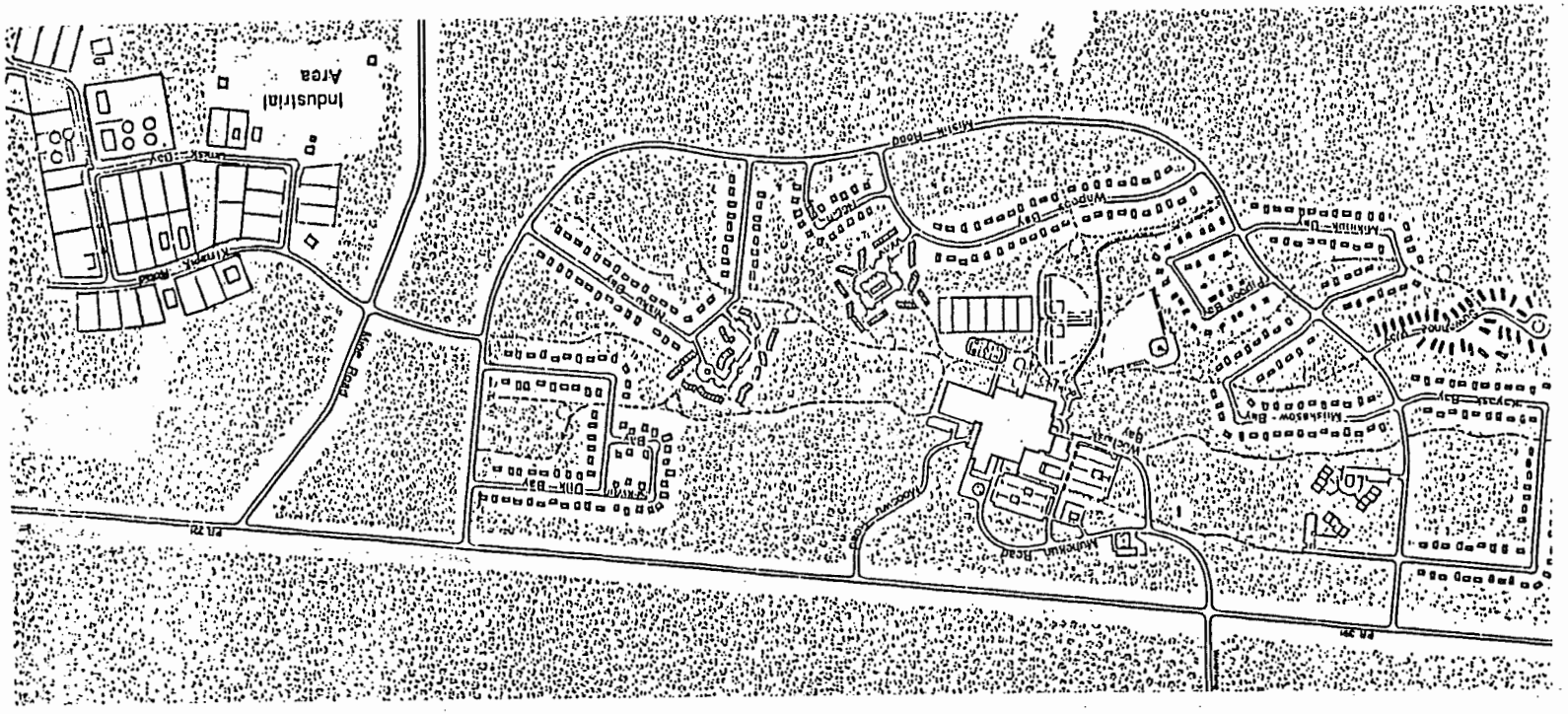
(iii) reduced maintenance costs resulting from servicing a shorter linear footage of access routes. Maintenance costs include such items as road maintenance, snow clearance and plowing.[39]

The compact nature of the design is echoed in both street layout and building locations. The street hierarchy provided for four types of vehicular traffic circulation. Ranging from access roads to local streets, most thoroughfares were purposely designed as short, curving roadways.[40] Intended to discourage high speed traffic movement as well as to impede the development of snow funnel paths, the streetscape reinforced the original design concept. In terms of building location, the single-roof town centre provided the focal point of the community. In this sense the wind-screen structure was a natural attraction for the clustering of facilities. Located in its leeward side much of the community fell within the shadow of the town-centre.[41]

Fermont's wind-screen building is the most visible aspect of the winter-city planning initiative. It is a 55-foot-high, multi-purpose structure that

Figure 6

Leaf Rapids Townsite Map



Source: H.D. Linn and J.C. Stabler, Economic, Social and Planning Requirements for Northern Communities (Regina: Department of Mineral Resources, 1978).

was designed to give the community "protection from the predominant north-western and northern winds."[42] In the tradition of Erskine's wind-screen building at Svappavaara, Fermont's edifice was determined to provide a shadowing effect to approximately two-thirds of the townsite.[43] Its practical application in Fermont was confirmed in a battery of tests conducted on scale models by Professor Theakston at the University of Guelph. Theakston's summary report concluded that:

1) ...the location of the windscreen building provides considerable protection for the Townsite of Fermont with wind from the north-west, north north-west....

2) The location of the streets in the Townsite of Fermont are oriented correctly for maximum dissemination of snow....

3) The roof conformation...is optimum for minimizing snow load....
4) The area to the leeside of the windscreen building accumulates considerable snow but wind effects are decreased by the protective measure....[44]

Locally known as "le mur," the windscreen building also performs an important town centre function.[45] Described by B. van Ginkel as "two rectilinear wings," the wall consists of dwelling units, a pedestrian walkway and three distinct centres of activity in the way of educational, shopping and recreational centres.[46] The apartments are all designed to maximize solar access. Day-time use rooms for example have a southern exposure while bedrooms face the north. As well, every unit with two or more bedrooms, is provided with a balcony facing the townsite proper. The climate controlled walkway winds along the ground floor of the building and provides comfortable access to all community facilities. The educational centre is located in the southern segment of the wall and includes both elementary and secondary facilities. The shopping component of the centre is found on the northern side of the building and is provided with reasonable vehicular access. Finally, the recreational area which includes an arena, curling facilities, bowling alleys and an indoor swimming pool is located on the windward side of the building.[47]

Housing type and mix, was given a great deal of attention in the preliminary planning stage. In detailing a variety of social, physical and

environmental factors, seven essential design considerations dictated housing policy. Giving rise to a housing ratio of one-third apartment, one-third townhouse or semi-detached and one-third single family dwelling, these features included:

1) to provide a large variety of dwelling units...

2) to define interior and exterior spaces according to the hierarchy of private, semi-private, semi-public and public domains.

3) to provide commercial service and recreational facilities to satisfy personal, family and social needs.

4) to enable the maximum number of residents to enjoy the prospects offered by the development site, namely the lake front view.

5) to mitigate the adverse climate forces by orienting most dwelling units south, south-east and south-west and by creating sheltered outdoor spaces.

6) to ensure the possibility of cross ventilation - when so desired - for all dwelling units.

7) to provide each home with outdoor extensions in the form of gardens, patios, terraces or balconies suitable for outdoor living.[48]

Of particular note in the discussion of housing and housing density, was the concerted effort made to provide compatible outdoor space. The sheltered patios or balconies combined with features such as mud-room facilities to offer a complimentary indoor-outdoor environment.

Although as argued by Schoenauer, Fermont may indeed represent "the fifth generation of sub-Arctic settlements," it is by no means problem free.[49] Criticism has been levelled at the lack of tree cover, the poor sound insulation of the wind-screen building, the partially empty shopping area and the seemingly endless issue of loitering and the problems inherent therein. Nonetheless, when and if a future resource development project warrants the creation of community facilities, Fermont has provided a model to follow.

The community of Leaf Rapids, Manitoba, like Fermont, offers something of a model in the application of winter city design techniques for the resource sector. The community is located approximately 950 kilometers northwest of Winnipeg. It was developed in conjunction with the Sherritt Gordon mining

operation at the Ruttan mine. Although Sherritt Gordon participated in the town planning process, most of the planning initiative was exercised by the provincial government. Through the Leaf Rapids Development Corporation which was created in 1971 "for the purpose of planning and developing the townsite," the province undertook the creation of the new town.[50] On the recommendation of the Planning and Priorities Committee of Cabinet, the provincial government rejected the original town plan as proposed by the mining company in favour of one that took into consideration the "delicate northern environment."[51] Cited by David Clunie for its "imaginative" approach to community development,[52] the Leaf Rapids townsite plan as designed by the provincial government called for:

1) Retention of large tracts of trees and vegetation.

2) Pedestrian pathway systems linking all residential units to the town centre.

3) Multi-use town centre under a climate-controlled roof.

4) Innovative approach in developing the town.[53]

In an effort to facilitate the development of a "national park-like environment," the plan provided for the preservation of the townsite's natural vegetation.[54] Both within the individual neighbourhoods and as a buffer between zones, tree cover was considered an integral part of the overall design of the community. It would appear however that this was incorporated more for aesthetic purposes than climate control. Nonetheless and particularly in terms of the "fifty-foot buffer strips of trees," shelter was provided to the community through environmental management.[55]

Directly associated with the maintenance of the three parkland area, was the provision of sheltered pedestrian pathways.[56] Adding to the appearance of the townsite as well as in a more practical manner, facilitating pedestrian access to the core area, the network of walkways enhanced the rural appeal of the community. In a small way, too, the pathways provided for a number of leisure time activities, from bicycling in the summer to skiing in the winter.

The most telling evidence of the winter city initiative at Lead Rapids is

the town centre complex. Designed by Leslie Stecheson and Associates, the $8.5 million structure was intended to

> ...provide facilities under one roof, for virtually all the public services required in the town, and in doing so, to create a "heart" for the community.[57]

The "integrated" town centre was viewed as not only a functionally efficient unit for the northern environment but it was also seen as an economically sound investment.[58] Included in the complex is a school designed for 625 students, a community health and social development centre, a 40 room hotel, a recreational facility complete with an indoor arena, a curling rink and a variety of other facilities. The 220,000 square foot building was planned in four quadrants and centred on what was described by Stecheson as a "town square."[59] Appropriately cited as Lead Rapids' "main street," the mall fills both a retail and a social function in the community.[60]

The actual physical design of the complex, like the concept itself, is in keeping with the themes of the winter city. The structure was built to fit snugly into a sloping hillside. Using "clerestories" at the appropriate angle, direct sunlight penetrated into the town-square area.[61] This when combined with the "rich and warm" colour tones, the natural wood finish and the liberal distribution of potted plants, offered a pleasant if not soothing internal environment.[62]

While both Leaf Rapids and Fermont display some of the more positive aspects of the winter city planning theme, the best application of the winter city initiative has occurred at Tumbler Ridge, British Columbia. Located in the coalfields of B.C., approximately 660 kilometers northeast of Vancouver, Tumbler Ridge has been cited as "one of the few Canadian `mega-projects' of the 80s."[63] Intended to house the workers of British Petroleum's Sunkunka Bullmoose property and those employed by Denison Mines at both the Wolverine and Babcock developments, the community was planned to accommodate an eventual population of 10,000 inhabitants.[64]

From its inception in 1977, the community plan appeared to reflect a genuine concern for the social needs of the future inhabitants. Richard Rabnett, who assumed most of the responsibility for the design of the

townsite, underscored this predisposition when he suggested that the community was

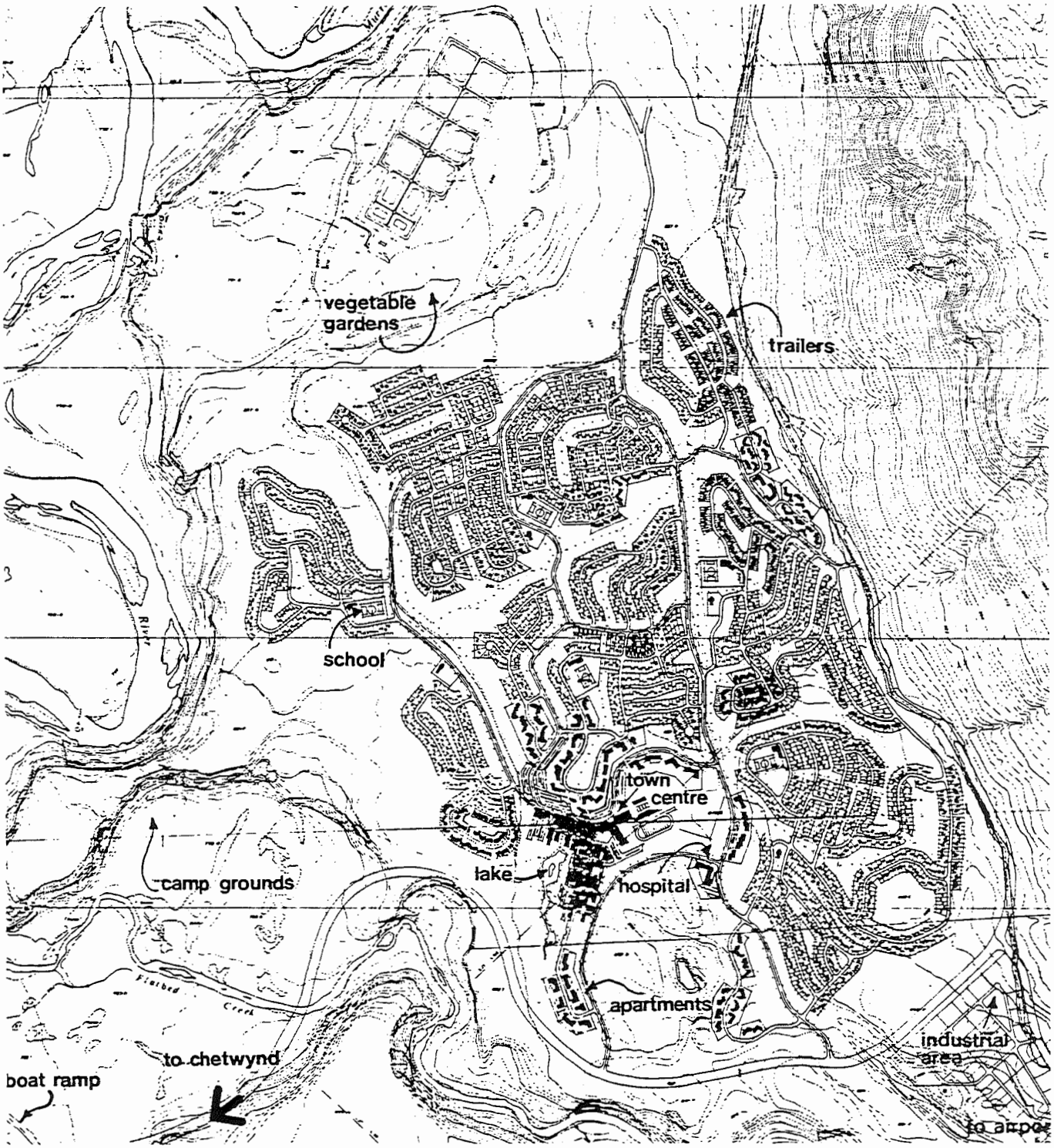
> ...designed from the inside out. We started by thinking of the individual then proceeded to the family, to the home, to clusters of homes, to neighbourhoods, to the town itself.[65]

The design process codified the livable town perspective of the planning initiative. Described by the consulting firm of Thompson, Berwick, Pratt and Parker as a "linear sequence," townsite design was a four phased program which included: preliminary site testing through air photo interpretation, contour mapping and the compilation of climatic data; the review of development constraints - i.e., water sources or potential gravel extraction site; the locational suitability of townsite components, in consideration of shelter types and densities, town centre concepts, etc.; and, locational sensitivity in terms of socio-spatial guidelines.[66] This linear sequence of events eventually gave rise to a two pronged planning program. In the first case, a low density townsite was designed, "sensitive to the natural environment," while in the second a high density plan was formalized to "cope with natural constraints."[67] In both cases, climate and planning for a comfortable living environment, assumed a central place in the design initiative.

The dominant position of climatic considerations is well underscored by the planning report submitted to the Ministry of Municipal Affairs and Housing in 1978. Detailing regional patterns at both the macro and micro scale, site specific data and a comparative appraisal of Tumbler Ridge with other similarly positioned communities, the planning report clearly focussed on climatic variables.[68] In this fashion, for example, the effect of wind, sun, rain and snow on the proposed townsite was measured in minute detail. Sun shadow maps were computer prepared, potential frost pockets were identified and wind direction and velocity studied. Through all of this, wind and wind protection was recognized as the major problem confronting designers. Noting that "walls and buildings are [were] not adequate windbreaks as they divert the wind, often causing higher velocity conditions elsewhere and eddies stirring up dust," the plan called for the "saving of trees."[69] Further recommending "recurring windbreak," a series of major and minor treebelts were developed with some planting between buildings in an effort to reduce turbulence.

Figure 7

Tumbler Ridge Townsite Map - Plan A



Source: Thompson, Berwick, Pratt and Partners, Conceptual Plan, Tumbler Ridge (Victoria: Ministry of Municipal Affairs and Housing, 1978).

Figure 8

Tumbler Ridge Townsite Map - Plan B

Source: Thompson, Berwick, Pratt and Partners, Conceptual Plan, Tumbler Ridge (Victoria: Ministry of Municipal Affairs and Housing, 1978).

The specifics of the winter city theme as applied in Tumbler Ridge are discussed by Ted Martin in a paper entitled "Community Energy Conservation." Described as the "basic principles" of community design, the winter city initiative included:

1) land efficiency: compact lets and housing clusters

2) network efficiency: reducing the lengths of roads and services

3) solar design: orienting and spacing houses to receive passive solar gain

4) wind protection: reducing wind velocities around the housing unit in order to cut infiltration - related heat losses.[70]

These principles, when actually incorporated in the design process, gave rise to:

> ...compact lots oriented north-south along east-west and north-south streets, housing clusters primarily in the form of a cul-de-sac of 20 to 30 lots, retention of major tree shelter belts throughout the community, compact overall community form, radial collection roads from the Town Centre to neighbourhoods, and location of the higher density development [apartments] within walking distance of the Town Centre.[71]

The town centre complex has been described as the "most important component" of the planning process.[72] This is particularly true in terms of the recreational facilities found therein. It was recognized at an early point that the stability of the community was dependent upon a contented workforce which in turn was ensured by high quality facilities including: the secondary school; retail services; a hotel and motel; the municipal hall; and the community centre. The complex was fully intended to function as the "downtown."[73] It was, however, more than simply a town centre complex as the planners opted for an "old fashioned" type of town centre.[74] Protected outdoor walkways, landscaped park areas and centrally located meeting places all enhanced the outdoor appeal of the core area.

While the Tumbler Ridge case study has helped to establish a certain precedent of winter city design, it has also identified a number of redundant planning procedures.[75] As, for example, structures become more energy-efficient, factors such as wind or sun orientation become less and less important. Although much can be said for the so-called "new era of resource

community design," much can also be said for the way it has helped to refine the community initiative.[76] Perhaps in the end, it is the concept of community that requires reworking rather than the infrastructure of community.

7.0 THE NON-PERMANENT COMMUNITY

The non-permanent resource community, like Tumbler Ridge or Manitouwadge, is in part a response to the climatic or environmental conditions of the north. While Tumbler Ridge embraces the variation in climate and Manitouwadge simply attempts to cope with the same, the non-permanent community, in the style of Frederick Gutheim's "nuclear submarine," "stays submerged for months at a time."[77] This too, however, is an attempt to live with the harsh winter climate and in many respects, is a more realistic appraisal of northern constraints. Where community developers have traditionally attempted to "meet and defeat" the climatic conditions of the north, the non-permanent community displays no such confrontation.[78] Rather, it recognizes the limitations of community and establishes the parameters of settlement accordingly. Whether this takes the form of demountable housing, trailer-styled bunkhouses or sectional dwelling units, the non-permanent community is the most flexible and perhaps the most suitable response to the resource sectors housing needs.

The non-permanent community has met with varying degrees of success across the north. The Granduc Mines project north of Stewart, British Columbia, the Rabbit Lake development in Northern Saskatchewan or the Petro Canada "Arctic Pilot Design Study" on Melville Island in the Northwest Territories, all lend credence to the concept of the temporary community.[79] With facilities ranging from "hostel" units to "motel-type accommodation," these sleep camps provide for the immediate needs of the workers with a minimum of overhead costs. Like the facilities themselves, the design effort is of a limited nature with perhaps the biggest obstacle to development being the transportation of materials to and from the site.

One of the best contemporary examples of the non-permanent community is the Cominco project on Little Cornwalis Island in the Northwest Territories. Located approximately ninety miles south of the magnetic north pole, the

minesite is not only pioneering industrial expansion in the far north but also community development. The project which was started in the summer of 1980, was intended to accommodate approximately 240 inhabitants on a fly-in/fly-out, two month occupancy basis.[80]

The design of the site has been described as a "linear configuration."[81] As one of the most novel responses to building in the north, the development program called for the utilization of a "construction hangar."[82] A large gymnasium, which was erected on railway tracks, provided a protective shell within which the community evolved. As each stage was completed, the hangar was shifted along the line, offering shelter for the various phases of development. A series of pre-engineered modules were fitted together in this manner, forming the basis of the community. Included in the structure were 120 single and 120 double occupancy rooms; a kitchen; dining facilities; administrative offices; an infirmary; recreational facilities such as a swimming pool, exercise area, lounges, library and a games area; and a variety of other community oriented features.[83] Encompassing an area of approximately 110,000 square feet, the buildings main asset was flexibility, as interior space could be regularly remodelled as the need arose. This did indeed occur shortly after completion as the demand for married couple accommodation far exceeded initial expectations. As a result, two floors of an unfinished module were converted to suite-styled apartment units.

The Polaris Project is a good example of the responsive style of settlement now possible in the resource sector. While on the one hand it acknowledged what Colin Bent has cited as "the constraints of the north," on the other it provided a built in flexibility that is so crucial to northern survival.[84] It also reinforced the regional quality of settlement and in part provided for a more stable economy.

8.0 CONCLUSION

In general, the resource community has traditionally been receptive to the themes of planning for winter livability. Certainly there have been a number of exceptions to this rule - most notably some of the early extractive

communities such as Cobalt or Kirkland Lake - but the instant town complexion of the resource community phenomenon has offered to inhabitants a fairly hospitable living environment. Through garden city planning, the incorporation of radburn principles, comprehensive design techniques and the actual implementation of winter city planning, the resource town has fared relatively well. Contemporary thinking, however, suggests that the community orientation of the resource town is perhaps not the optimum response to the resource projects accommodation needs. In this vein, the non-permanent community may indeed be a better solution to both the problems of the resource development scheme and the issues of winter livability.

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