OPEN SPACES: QUANTITY OR QUALITY[1]

by Eric Rey-Lescure

Abstract. Urban and regional open spaces play many roles, where outdoor recreation has a much wider context than that of existing parks. North American park standards are inadequate and unrealistic when applied to the Montreal Urban Community. The regional open space index (ROSI) is suggested as a means of evaluating and analyzing open spaces that offer recreational activities while adding to regional, natural and cultural diversity. This index, based on a number of spacial and social qualitative characteristics, evaluates the proportion of spaces developed in view of outdoor recreational activities according to an acceptable minimum with regard to all available spaces. It enables judicious sectorial interventions and generally proposes an integrated framework for an outdoor space development policy. In the long run, it will serve to evaluate the evolution of urban open space development.

Open spaces are much more numerous and varied than green spaces or the variety of parks with which we are familiar. They play impressive roles that are not limited to outdoor leisure and recreational activities. However, in municipal planning, standards governing this sector are largely inadequate. Urban and regional open space concepts should be reorganized, placing emphasis on representative elements of the regional open landscape, which might be evaluated by an index designed for this purpose.

Open spaces literally mean soil and water open to the sky. However, a functional approach distinguishing production, public protection and recreatonal areas may be used. Tankel (1963) or Parlour et al. (1972) prefer to adopt a social or behavioristic approach and separate the open spaces perceived by the public from those that are not. They classify those spaces according to their degree of suitability to various social needs.

A synthesis of the above is proposed: open spaces include all non-built-up areas within the natural or man-made landscape in which each component, divided into parcels or regions, publicly or privately owned, plays one or several roles simultaneously. These roles include free public recreational or leisure activities, as well as ensuring important operational stability for urban communities, on ecological and economic or social levels.

What do open spaces mean in an urban context?

Many people will be surprised to learn that 80% of the urban territory generally consists of open spaces (Burton et al. 1977) with extremes like 94% for Halifax and 56% for the most densely populated part of Montreal (Jacobs 1973). In Halifax, 43% of the open spaces are occupied by public communication corridors (roads, railroads, wharves). Roads for motor vehicles take up one third of this total. In a regional context, other spaces are used for public utility purposes: dumps, power transmission line corridors; public safety functions: airport protection zones, flood plains; or production functions: vegetable farming, tree nurseries. A number of these spaces are ecological or wildlife preservation areas dedicated to biological conservation. Finally, the open spaces most familiar to the general public are recreational areas: neighborhood parks, city parks, or generally speaking, green spaces. Let us examine this last category.

Standards

Park planners in the United States and Canada have put forward similar standards to determine the average requirements in acres per 1,000 inhabitants:

	acres/1,000 inhabitants
Neighborhood and district parks	2 to 5
City parks	5
Regional parks	10 to 20
TOTAL	17 to 30

Those standards being arbitrary, rigid and subjec-

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tive were widely criticized. They are presented as a minimum requirement but used as a maximum. They ensure homogenity between cities, but annihilate creativity and innovation (Burton 1976). Furthermore, they take no account of the needs of the population and its preferences (Rogers 1974).

According to available data, no North American city entirely meets these standards. A study was made of the situation in Montreal, more specifically the Island of Montreal which includes 29 municipalities of the Montreal Urban Community (MUC), although it does not include the entire Montreal metropolitan area. The park standard applied to this territory would establish a ratio of 15 acres per 1,000 inhabitants. The 1976 count of 4,556 acres of park for 2,225,000 people resulted in a meager 2.04 acres per 1,000 inhabitants. To reach the proposed ratio of 15 acres per 1,000 inhabitants all the island's non-urbanized land (31,500 acres) would have to be bought and transformed into parks. Even if the 4,500 acres of unprotected urban forest (outside existing parks) were bought, the resulting park area would only be doubled to 4.07 acres/1,000 inhabitants. Furthermore, the population and its recreational needs will increase in the future and this expansion will be detrimental to spaces presently available for parks.

Faced with this failure of the standards to correspond even remotely to reality, the whole context of outdoor recreational activities must be reconsidered.

The open landscape of regional significance

The various types of urban and regional open spaces, streets, parks, river banks and power line corridors, represent a spatial framework that includes all the characteristics of a system described by Zisman and Ward (1968). This system has edges, linkages, penetrants and also visual components. The characteristics of this system are not only visual: each of its elements has several common points due to their general functions. Common to the river banks, the tranquility of a cemetery (Figure 1), or the forest of a large regional park, is the possibility of using them for activities such as walking, bird watching or meditation. In addition to transportation, streets may be used for walking and sport activities. Power transmission line corridors are used more and more for the development of bicycle trails or community gardens. Similar examples are numerous and, consequently, surface of land devoted exclusively to parks can become stabilized, although supporters of the present norms seem hesitant to accept this. Games, and some kind of sport or intellectual activities will continue in all appropriate open spaces where legal and secure access is provided and where the natural qualities of the space are favorable.

No way of evaluating this open space system exists, consequently, development objectives cannot be determined and the performance of urban development cannot be evaluated. Open space elements, whose main or secondary functions include all forms of outdoor recreational possibilities, must be evaluated together with natural environmental conservation functions as well as urban design functions. Together they form an entity which we call the *Regional Open Landscape.* This landscape is an important description of the urban region, analogous to the image of the city as defined by Lynch (1960) with the exception that the Regional Open Landscape is essentially devoid of buildings. These components must represent the diversity of the biophysical, visual and/or cultural heritage and finally, they must be able to be analyzed using simple objective data, estimates or projections.

The following are felt to be the most representative components of open landscape for the Island of Montreal:

- —Metropolitan parks
- —Urban parks
- —Golf courses
- —General use areas operated by institutions (i.e. nature centres)
- —Regional open lands (i.e. non-urbanized lands other than forests)
- —Unprotected forests (i.e. other than parks)
- —The shore line (i.e. river bank)
- —Functional corridors (i.e. canals, major corridors)

For example, many factors warrant the choice of river banks. They play a natural role in the protec-

tion of flood plains and the prevention of erosion. Their recreational potential is important for walking or as a riverside park. Finally, they afford a view of the St. Lawrence River, thus encouraging a closer relationship between the population and the river.

Equivalent surface

The *equivalent surface* is the major concept underlying the proposed indexes. It can be agreed that a park without trees has no great social or recreative value and the deprivation of the river banks annihilates its recreational use and visual enjoyment. The equivalent surface is a theoretical surface representing the portion of the total surface of the component which has been developed in order to meet a mnimum social use. It is obtained by multiplying the existing surface by a development factor and an accessibility factor. Each of these factors consists of one or more key elements depending on the components of the regional open landscape (Table 1). Each key element is related to a minimum requirement. For example, a metropolitan park (Figure 2) must have equipment and human resources, a minimum of good natural characteristics and good visual and physical accessibility which will afford a minimum range of public activities, no matter how exceptional the equipment that may be available (i.e. summer theatre, zoo, museum . . .). Another example is a golf course, where the availability for cross-country skiing in winter must be considered. If a city has a 300 acre golf course with a maximum winter utilization of 6 months, the golf component of the regional open landscape of this city will be considered 150 acres. If winter access is public and free, the *equivalent* surface will be 150 acres (accessibility factor equal to 1). If the population has to pay a fee, the *equivalent* surface is reduced to 90 acres (accessibility factor equal to 0.6) and if the population has no access

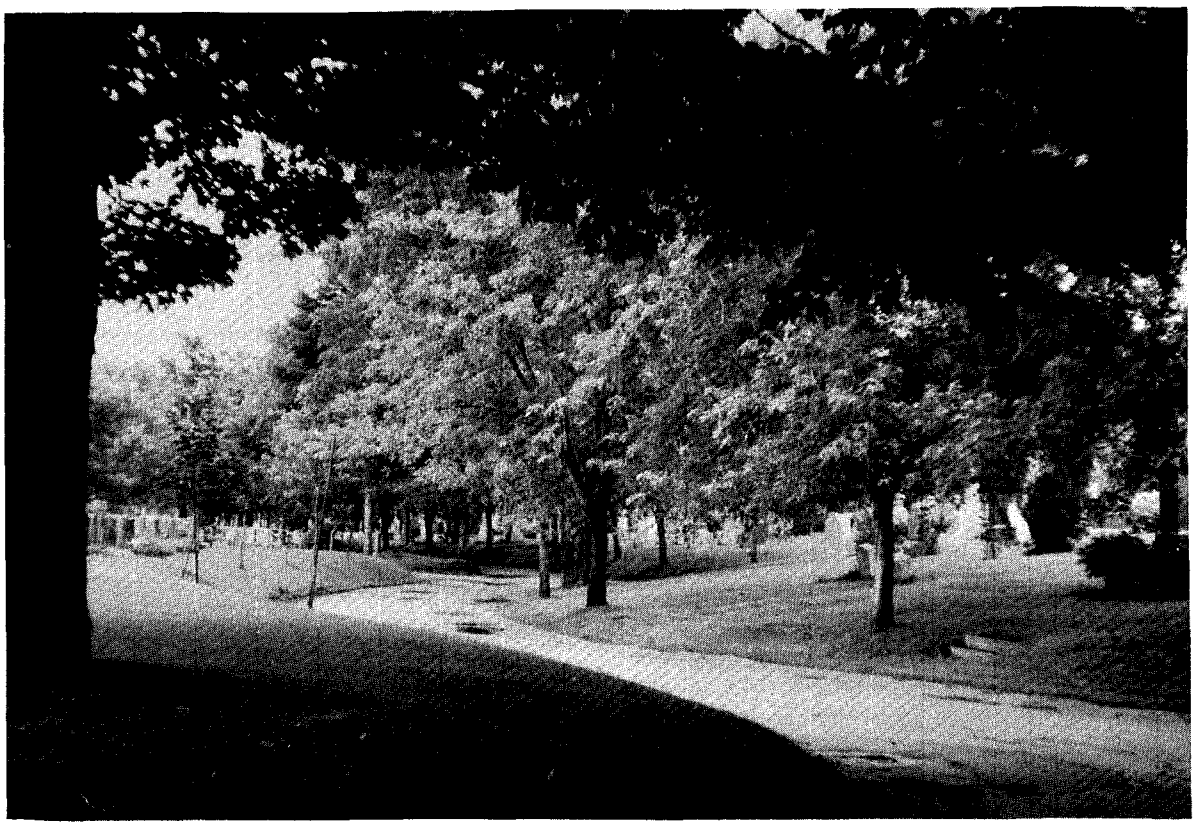

Figure 1. Cote-des-Neiges cemetery located in the heart of Montreal is a good example of a place to meditate or bird watch.

to it, the equivalent surface is 30 (factor equal to 0.2).

To make the evaluation more objective each of the key element characteristics are rated on a nominal scale:

(+): Minimum availability = acceptable.
(0): Limited use of the area does not permit minimum availability = poor.
(−): Limitations are too numerous, no availability = bad.

For example, in the key element (natural condition) the characteristic represented by a well-tended lawn and decorative trees rates a (+), a well-tended lawn without trees rates (0), untended lawn rates a (−). The nominal values are then converted into numerical values (between 0.20 and 1.00) according to a table which is based on the number of characteristics of the key element. An average of these numerical values (lower or equal to 1.00) is multiplied by the present total surface of the component to find the equivalent surface.

Regional open space index

Finally, the regional open space index (ROSI) is defined as the sum of equivalent surfaces over the sum of existing total surfaces representing the regional open landscape.

$$\text{ROSI} = \frac{\text{Equivalent surfaces}}{\text{Existing surfaces}}$$

In time (ti) it will be possible to establish the ROS — Cross Sectional Index:

$$\text{ROS—Cross Sectional Index to ti} = \frac{\text{Equivalent surfaces to ti}}{\text{Existing surfaces to ti}}$$

This index may be interpreted as being the proportion of financial and human efforts made by municipal or governmental authorities to develop each regional open landscape component to its minimum potential. It is also possible to obtain the

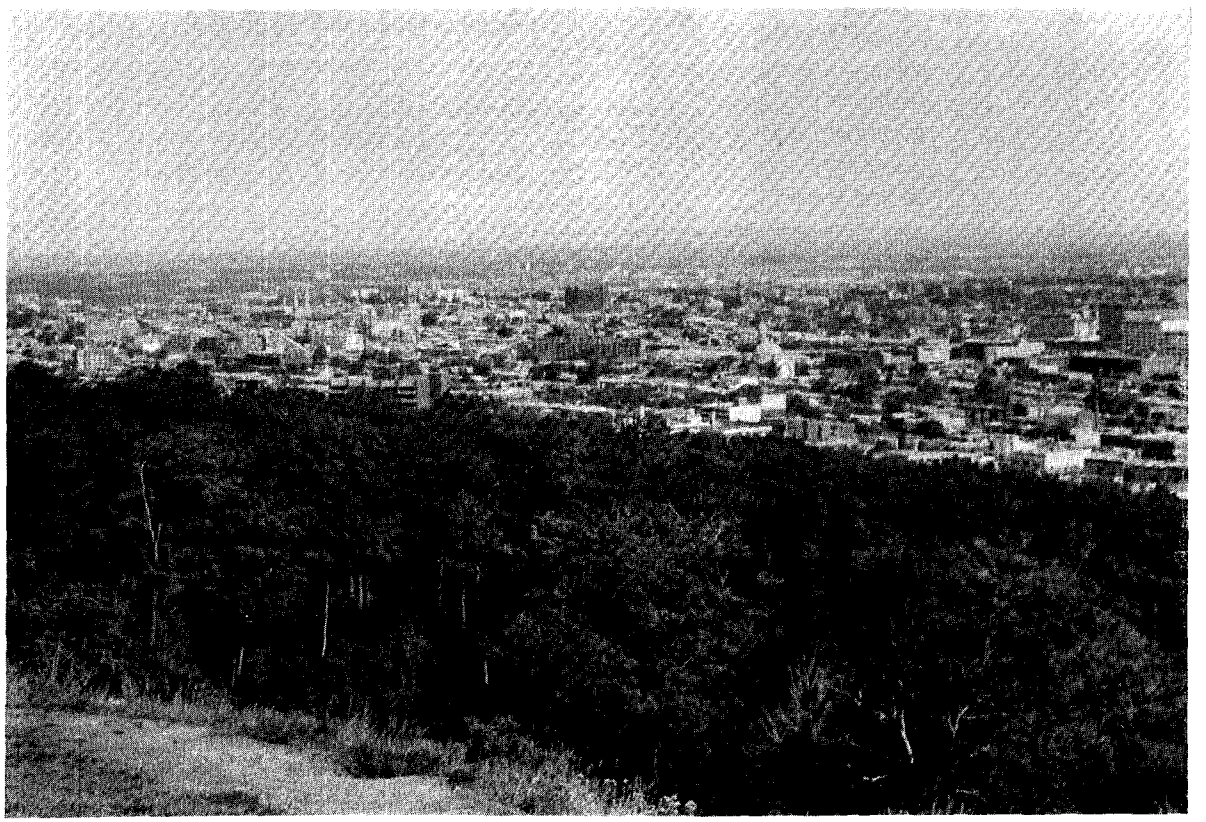

Figure 2. A view of Montreal from the top of Mont Royal Park showing one of the last natural forests of Montreal Island.

ROS — Time Series Index to ti taking for a base time (tO).

$$\text{ROS-Time Series Index} = \frac{\text{Equivalent surfaces to ti present totO}}{\text{Existing surfaces to tO}}$$

The time series index enables periodical comparison of efforts made since tO. It provides the possibility of evaluating the city's performance, the urban or regional community in the development of available open spaces for the benefit of the population.

Without emphasizing the importance of the index in the planning of a development policy for outdoor areas within the MUC, let us examine the

TABLE I — Characteristics of key elements compared to open regional landscape components.

	DEVELOPMENT FACTOR			ACCESSIBILITY		FACTOR
	EQUIPMENT	*HUMAN RESOURCES*	*NATURAL CONDITION*	*PHYSICAL*	*VISUAL*	*SOCIAL*
METROPOLITAN PARKS	Belt trail. Cleared area. Flat, well-drained ground. One stretch of water. Possibly suitable for sliding or skiing depending on topography. Central kiosk.	Supervision or police control.	Natural woodland with natural undergrowth.	A 5 mile radius reaches a a maximum of population.	Surface proportion with visual accessibility towards the exterior.	
URBAN PARKS	Belt trail. Flat, well-drained ground. One stretch of water. Seats. Accessories. Children's games. Track and field. Signs and Posting.	Supervision or police. Instructors. Summer play grounds. Trainers and referees.	Well-tended lawn and decorative trees.	To reach a maximum of population within a radius proportional to the size of the park.	IDEM	
GOLF						Free and public access during winter (cross-country skiing).

results. In 1975, the average ROSI was 0.78 with significant variations. Thus, with a 0.98 index, the metropolitan parks of that region were very satisfactorily developed considering the minimum required characteristics. On the other hand, the situation of the river banks was less interesting with a 0.70 index.

A close analysis of the results indicates a good natural condition (0.83), excellent physical accessibility (0.96), satisfactory visual accessibility (0.74), but very poor social accessibility (0.29) (Figure 3). A program of progressive acquisition of the banks by the municipalities should be strongly recommended to improve the regional open land-

GENERAL USE SPACES	Belt trail. Cleared areas. Central kiosk. Signs.	Guides naturalists.	2 climatic forest ecosystems diversified (inventoried) ornithologic fauna.	A 5 mile radius reaches a maximum of population. High (traffic) road and public transportation.	IDEM	Free and public access all year-round.
REGIONAL OPEN SPACES			Possibilities for recreational and sport installations.	High (traffic) road		
URBAN FORESTS			Recreational potential. forest activities.	High (traffic) road		
RIVER BANKS			Well-tended lawn. Decorative trees.	Belt road nearby (proportion).	IDEM	Proportion of public property banks
FUNCTIONAL CORRIDORS	Belt trail. Flat, well-drained ground. Stretch of Water. Seats.		Well-tended lawn. Decorative trees.	Public road nearby (proportion).		

scape representative of Montrealers' natural and cultural heritage.

Conclusion

Since the phenomenon of outdoor recreation extends far beyond existing parks to include vast open spaces which encompass related fields such as public safety, ecological balance and visual diversity, we hope we have developed a tool for the evaluation, analysis and projection of a given regional situation; its focus on qualitative aspects of space centers more on human needs than on theoretical objectives too often put forward by politicians or planners.

This study is merely a reference framework, as the potential of open spaces is not the same in Montreal, Toronto or Houston. However, because of its flexibility, it can be adapted in time to any situation. For example, unused railroads in an urban environment may be added to the present surface of corridors. The index has been developed at the regional level, but it could easily be refined and modified at the municipal or local levels.

Finally, the index attempts to re-evaluate from the perspective of an urban forester the development philosophy of our outdoor environment.

Literature Cited

Burton, T.L. 1976. *Urban open space planning—Standards uniformity.* Recreation Canada 34(3): 29-32.

Burton, T.L., J.B. Ellis and H.P.M. Homenuck. 1977. *Guidelines for urban open space planning,* Canadian Parks Recreation Association, Vanier City, Ont.

Jacobs, P. 1973. *Urban Space.* Minist. State Urban Affairs, Ottawa.

Lynch, K. 1960. *The Image of the City.* M.I.T. Press, Cambridge, Mass.

Parlour, J.W., E.N.R. Roberts and K. Balmer. 1972. *Open Space and the Canadian urban environment,* Minist. State Urban Affairs, Ottawa.

Rogers, M.P. 1974. *Assessing public recreation needs.* Discussion Paper, Tech. Assistance Bull. No. 1. Bur. of Outdoor Rec., U.S. Dept. Inter., Lake Central Reg. Michigan.

Tankel, S.B. 1963. *The importance of open space in the urban pattern.* In: Cities and Space, Johns Hopkins Press, Baltimore, Md.

Zisman, S.B. and D.B. Ward. 1968. *Where not to build—A guide for open space planning.* M.U.S. Dept. Inter., Washington.

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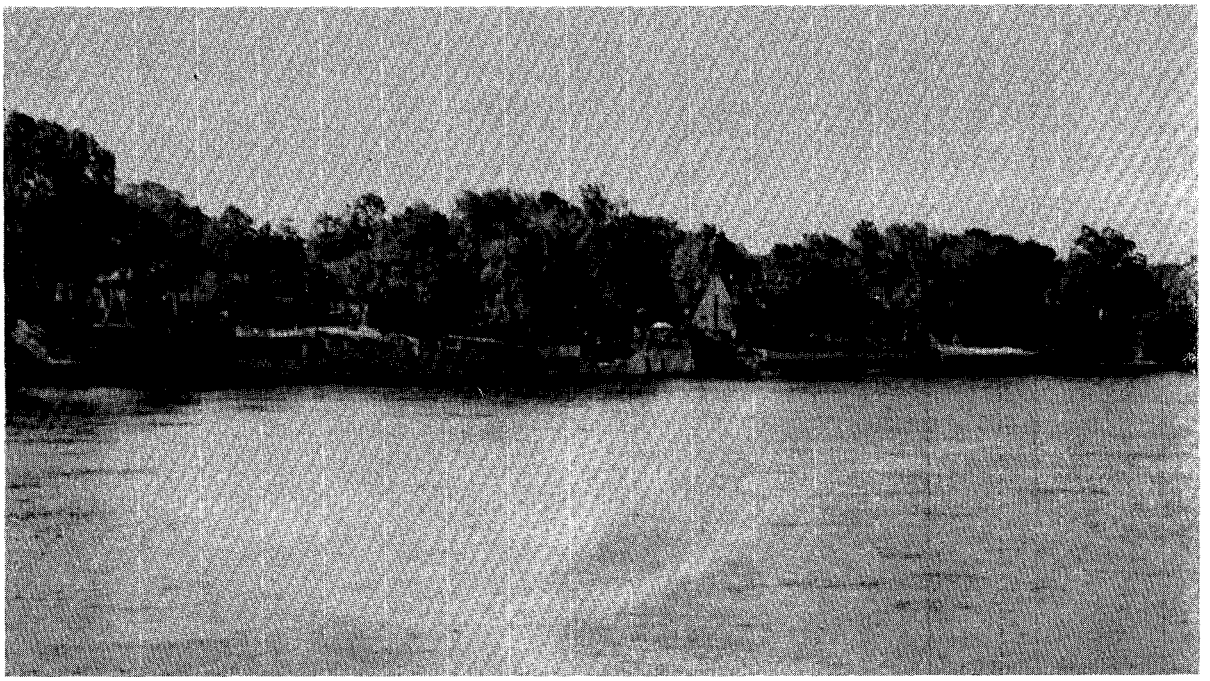

Figure 3. Private homes or cottages occupy most of the river banks on Montreal Island.