



Go for Green
The Active Living & Environment Program

A Discussion Paper

FITTING PLACES:

How the Built Environment Affects Active Living and Active Transportation



Submitted by:
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Consultants

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How the Built Environment Affects Active Living: A Discussion Paper

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Table of Contents

EXECUTIVE SUMMARY	i
1.0 INTRODUCTION AND DEFINITIONS	1
2.0 HOW THE BUILT ENVIRONMENT INFLUENCES ACTIVE LIVING ...	2
2.1 Transportation	2
2.2 Access to Open Spaces and Recreation Facilities	6
2.3 Barrier-free Access to Buildings	8
2.4 Pollution and Accidents	9
2.5 Security from Crime	10
2.6 Social Networks	12
2.7 Winter Conditions	14
3.0 OPPORTUNITIES TO INCREASE ACTIVE LIVING THROUGH CHANGES TO THE BUILT ENVIRONMENT	16
3.1 New Urbanism, also known as Neotraditional Design	17
3.2 Alternative Transportation Oriented Development	17
3.3 Infill, Retrofit and Reurbanisation	19
3.4 Traffic Calming	19
3.5 New Retail Patterns	20
3.6 New Work Patterns based on New Technologies	21
3.7 The Planning and Development Process	21
4.0 SOCIETAL AND POLITICAL TRENDS WHICH ARE OPPORTUNITIES FOR A BUILT ENVIRONMENT CONDUCTIVE TO ACTIVE LIVING	23
4.1 Evolving Public Opinion	23
4.2 Sustainable Development	24
4.3 Infrastructure Affordability	25
4.4 Kyoto Agreement on Reducing Greenhouse Gas Emissions	26
5.0 KEY DETERMINANTS: TOWARDS A CONCEPTUAL FRAMEWORK OF THE BUILT ENVIRONMENT AND ACTIVE LIVING	28
5.1 Proximity	28
5.2 Scale, or Intensity	29
5.3 Complementarity	29
5.4 Safety and Attractiveness	29
5.5 Convenience	29

6.0	RECOMMENDATIONS FOR ACTION	30
6.1	Strategic Leadership and Policy Development	30
6.2	Partnerships and Alliances	31
6.3	Community Mobilization	32
6.4	Promotion and Encouragement	33
6.5	Knowledge Development and Dissemination	33
7.0	SUMMARY AND CONCLUSION	35
8.0	REFERENCES	37
APPENDIX 1		
	Historical Overview of Urban Development and Health	43
APPENDIX 2		
	Details on the System for Planning the Built Environment	45
APPENDIX 3		
	Reflection on the Dominant Built Form	47
APPENDIX 4		
	Evolution of the Conceptual Framework of Health to Include the Built Environment	50

Executive Summary



The way cities and towns are built influences the behaviour of the people who live in them. That includes our propensity to integrate physical activity into our daily or weekly routine, thus improving our health.

This discussion paper is intended to provide an introduction to the subject. It may act as a bridge between persons with an interest or expertise in health and those with an interest or expertise in urban development. Generally speaking, the former are aware of the health benefits of integrated physical activity, but have not considered the way the built environment can contribute to that. The latter group will be aware that the built environment affects behaviour, but generally do not realize the health benefits that would result from design modifications to support active living.

A number of examples of how the built environment affects active living positively or negatively are presented, based on a literature review by the authors. Canadian cities have a number of favourable features that encourage active living: for example, they tend to be relatively attractive, safe, clean and barrier-free. Private yards and public parks encourage outdoor recreation.

However, the greater part of most urban centres is arranged in a way that discourages people from travelling on foot or by bicycle, which is very unfortunate since those are the two most popular forms of physical activity and they provide excellent health benefits. This paper discusses the historical and systemic reasons for this.

Given the link between the layout of urban centres and their impact on active living, it is desirable to make changes that would improve health outcomes. This paper reviews a number of recent trends that provide some encouragement in that regard.

Canadian cities are planned in a public policy forum. The paper outlines how the planning and real estate systems work and shows how it is possible to intervene in them to improve active living outcomes.

Finally, the paper recommends actions to improve the health of Canadians by making the built environment more supportive of active living.

1.0

Introduction and Definitions



The purpose of this discussion paper is to show how the built environment influences our ability to integrate physical activity into our lives. It discusses some of the ways in which this happens, and how the health of Canadians can be improved through changes to the built environment. It makes recommendations for action.

In this paper *active living is defined as a way of life in which physical activity is valued and integrated into daily life.* Physical activity should be encouraged for its many benefits: health, social, cultural and environmental. The integration of physical activity into daily life makes it more accessible for the ordinary person, and experience shows that people are more likely to sustain integrated activity over a long period of time. Therefore the authors focus primarily on those physical activities that are more easily integrated into daily life, with a special emphasis on walking and cycling as modes of transportation, rather than on sports or fitness activities that take place in special facilities.

Integration also implies that the environment is not treated as something that is “out there”, a place where people go to be active. Rather, the environment is the space in which we live. The daily reality for the vast majority of Canadians is life in a city or a town, a human landscape that has been created by individual and collective decisions. In this paper, *the built environment refers to environments created by people.* This means buildings, streets, open spaces, transportation systems and the relationship of these elements to each other. The discussion applies mainly to cities and towns, with less relevance for rural areas and villages.

[Appendix 4 contains background information on these definitions, and their evolution.]

2.0

How the Built Environment Influences Active Living



Most people going about their daily business take the built environment for granted, not realizing how it affects their behaviour in a thousand and one small ways. This section presents a sufficient number of specific influences to demonstrate that there is a linkage between the built environment and active living.

People who are not familiar with the workings of the land use planning system and the commercial real estate market do not realize to what extent the built form is a socio-economic construct. It is the result of private enterprise and public policy, influenced by cultural values and personal choices. This section provides a description of some of the “systemic” considerations underlying the built form.

■ 2.1 Transportation

Walking and Cycling

The most popular forms of physical activity are walking and riding a bicycle. (Craig; GTCC; Wankel & Hills) Although they can be forms of recreation, walking and cycling can also be means of transportation. As such, they have a lower environmental impact than cars or public transit, they provide door to door service, they don't require expensive infrastructure, and obviously they provide significant health benefits from the exercise. (Grafftey) A recent poll indicated that 82% of Canadians would *like* to walk more and that 66% would like to bike more. (Go for Green) So why don't they?

Since the goal of active living is to *integrate* physical activity into the daily routine, it is unfortunate that the greater part of most cities and towns are built in a way that discourages people from travelling on foot or by bicycle.

For most people it is too much of a challenge to walk or to ride their bicycle from their home to their job, or to do their errands and shopping on foot or by bicycle. The distances involved are simply too great. (Cragg et al; Vuori et al; Go for Green)

Why are towns and cities arranged in this fashion? The answers to that question are complex and inter-related. The factors discussed below are the land use planning system, the influence of the automobile and the road system, and the effect of social values as reflected in the real estate market and the institutions supporting it.

Land Use Planning

One of the basic principles of urban planning is to separate land uses into homogeneous zones containing only residential, or only commercial, or only industrial activity. (Hodge; Leung 1989; Pilette) A significant by-product of this planning approach is that the zones of land use activity are separated by long distances, which discourages walking and bicycling as modes of transportation.

Historically, there were very good reasons for separating the dirty industrial areas and the noisy commercial areas from clean and quiet residential areas. Some of the reasons still apply, for example wanting to keep truck traffic out of residential areas. But many of the reasons no longer apply because much more of the modern economy takes place in clean or controlled environments. In spite of this, separating land uses continues to be the norm. (Jamieson) [Appendix 1 explains this in more detail.]

Travelling on foot or by bicycle are also discouraged when the development within any one land use zone is of the low density

variety. “Low density” generally means buildings that are not tall enough to require elevators and/or where there is a generous space between buildings and between buildings and the street. These are conditions typical of suburban areas. Medium densities with smaller yards and buildings closer to the street may usually be found in the older and more central areas of cities, or for example in newer rowhouse developments. By contrast, central office and shopping areas that have tall buildings bordering on the sidewalk are considered high density, as are apartment tower complexes.

Low density means that the buildings are spread out over a large area, creating a need for mechanized transportation. For example, in business parks the restaurants are usually not within walking distance of the workplaces. Low density residential areas, with large building lots and few housing units per hectare, spread the number of consumers over a large area, which decreases the relative availability of local stores and services that provide walkable destinations. For example, in subdivisions of large single family homes, the nearest convenience store is often more than a practical walking distance.

One solution to this situation would be to mix land uses (and hence destinations such as work) within the same district. Another would be to build at medium density. For example, in neighbourhoods where the number of customers per hectare or kilometre is greater the convenience stores are usually are not as far apart and thus are more walkable.

Public Transportation

The solution to the large distances between land uses which has the next best encouragement of walking and cycling is public transportation, because passengers usually walk to and from the route stop at either end of their journey. Some people ride a bike from home to the route stop, some transit services allow people to take their bike on the train, and some provide bicycle parking at major transit stations.

However, low densities make this option less feasible by reducing the critical mass of transit riders necessary to support a schedule with frequent service and/or a service with geographic proximity assured by a closely knit web of routes. Long distances between destinations increase the costs of the service.

With medium density there tends to be better public transit, because there are more potential riders, which makes the service more economically efficient. Higher density housing districts are often planned at transit stations, which facilitates a lifestyle that is less reliant on the automobile and encourages more walking.

The Automobile and its Road System

The most common response to the predominant land use layout is to travel by automobile, which has led to a kind of vicious circle. Because parking areas and roads make up about 20-30% of the land area in cities, the space allocated to automobiles increases the distance that has to be travelled. (Environment Canada 1993) Use of vehicles adds to air pollution, which at critical levels can discourage people from being physically active out of doors. (Health Canada 1996)



The solution to the large distances between land uses which has the next best encouragement of walking and cycling is public transportation

When towns and cities are designed for cars, transportation plans tend to treat the pedestrian and cyclist as a lower priority, even as an impediment. Examples of this are streets that have been widened by making sidewalks narrower, traffic signals that don't allow enough time for slower pedestrians to cross the street, and streets that are too narrow for a bicycle lane.

New streets are often laid out in long, curving loops to discourage through traffic by automobiles, but that also makes it more awkward for pedestrians. When stores and shopping centres are set back from the street

with parking in front, they force pedestrians to walk further and to walk through uncomfortable and potentially dangerous auto-oriented environments.

The cumulative impact of the various zoning, traffic planning and design features of many urban areas is to discourage the integration of walking and bicycling into daily life, thus missing the opportunity to increase active living.

Public Finance and Legislation

One of the factors favouring the automobile oriented, low density suburban built form is that it has been the dominant form of development for a long enough period to become the framework for the legislative, financial, marketing and other mechanisms influencing planning and development. This results in a systemic tendency to perpetuate it. (Gertler) Tax revenues in the very prolonged period of economic growth that followed the Second World War allowed governments to supply the roads that make mass automobile commuting possible, and to extend water, sewer and other infrastructure over long distances. The housing industry is a major sector of economic activity, as measured by both employment and gross national product. Governments have intervened to stimulate new construction from time to time, to promote economic growth.

The Real Estate and Land Development Industry

Since the resale market of older homes is not an organized business force to the same degree, the new home sales industry is the major marketing influence. It has to some extent perpetuated a model which has

performed well in the past to avoid the risk associated with experimentation. It is the natural market advantage of each new home builder to promote the most profitable situation for the company, rather than considering the broader costs and benefits to the society. (Langdon 1994) That means home builders will build what home buyers will buy.

The Influence of Geographic, Socio-Economic and Cultural Values

People like suburban living, it is the lifestyle preferred by a majority of Canadians. (Chamberland) The stereotype of a “dream home” is a house with a (two car) garage and a swimming pool in the back yard. Perhaps this vision comes from the sheer size of our country that allows us the luxury of space, or a collective memory of our history when more people lived on the land. Even the urban planning profession has, as one of its enduring archetypes, the “garden city” concept, developed in the last century when cities were overcrowded and polluted. (Hodge)

The internationally famous Canadian author Hans Selye in his studies on stress noted that a certain level of stress is positive, but beyond that point it becomes distress. (Selye) Perhaps while people are drawn to cities and towns for employment and cultural activities, they tend to see quieter, greener, more controlled environments as a way to achieve balance.

Most Canadian cities are not hemmed in by natural geographic barriers, so there is little natural incentive to conserve land by building at medium densities. For the last fifty years, the cost of purchasing and operating an automobile has been financially

attainable by a majority of the new home purchasers who exert the strongest influence on the market. In our culture, the car is not only a pragmatic means of transportation, it is a symbol of many values including personal freedom and financial success. (Active Living Go for Green)

Conclusions

- 1) The urban planning system separates land uses into homogeneous single use zones, for historically valid reasons, some of which still apply. However, one result is that the distances between home, work, and shopping discourage people from walking or using bicycles as a means of transportation. This is very unfortunate for active living since these are the most popular and inexpensive forms of physical activity, with excellent health benefits.
- 2) In low density areas, travel distances even within the same zone discourage walking and cycling as reasonable modes of transportation.
- 3) Public transportation is the motorized transport most likely to encourage walking and cycling, as an adjunct to the bus or subway trip. However, long distances and low densities also affect this transportation choice, making it less competitive than it otherwise would be.
- 4) The result is a heavy reliance on the automobile, which consumes a lot of land in the form of roads and parking lots, which spreads the city out over even greater distances, and which provides the least inducement to incorporate walking and cycling into the daily routine.

- 5) There are socio-cultural, systemic and economic reasons why this form of built environment continues to dominate new development. As discussed in a later section some of these will likely be more openly challenged in the future, but it is a powerful fact of life at this time and a negative influence on the more “active” modes of transportation.

2.2 Access to Open Spaces and Recreation Facilities

Convenience of access to physical activity opportunities increases participation rates. In studies and surveys, people indicate that the availability of exercise facilities, parks and playgrounds is an important factor in their tendency to use them, especially when they are located near their residence or workplace. This is even more true for people with mobility restrictions such as youth and the elderly. (Wankel & Hills; Cragg et al; Harris et al; Godbey et al)

The importance of backyards and informal open spaces should not be underestimated. In surveys of the most popular forms of physical activity, gardening is usually ranked in the top six. (Craig; GTCC; Wankel & Hills) Backyards are favourite play spaces of children. (Mason; Garreau)

The term “ground-oriented housing” generally means that each home has direct access to an outdoor recreation space at ground level. The back yard of the single family home is the classic example. The small private area adjacent to a row housing unit also qualifies. The term ground oriented



The most important recreational facilities to people's personal quality of life were natural areas, parks and outdoor recreation facilities. The study found that the suburban and outlying areas had more of this type of space, including bike paths and walking trails

is sometimes stretched to include arrangements such as the upper unit in a duplex having shared use of the back yard with the lower unit, or an apartment unit with direct access to a large deck with planters built over a garage. Ground-oriented housing is clearly preferable in terms of encouraging gardening and playing.

In forms of housing where no individual back yard is possible, the next best solution is to provide nearby common space. Common open spaces provide the additional potential to expand social networks. Some developments have community gardens.

Most zoning by-laws require open spaces adjacent to residential buildings, and this is an aspect of the built environment which planning systems tend to manage rather well on the whole.

A study done in the greater Toronto area in 1995 reviewed the relative availability of community and recreation facilities. (GTCC) That study revealed that the most important recreational facilities to people's personal quality of life were natural areas, parks and outdoor recreation facilities. The study found that the suburban and outlying areas had more of this type of space, including bike paths and walking trails, than the inner areas of Toronto.

Two caveats should be expressed, however. Since this study was about recreation, the people were not necessarily using the bike trails and walking paths for transportation, and if bike lanes on streets had been included the inner areas of Toronto would probably have scored relatively better. Also, there is a nuance between being physically active and having an integrated active living lifestyle.

New family-oriented housing areas are typically very active places, with young adults and children taking advantage of the recreation opportunities that are normally in ample supply. However, it is usually necessary to drive to a special facility to exercise and as noted in the low density built form tends toward an auto dependent lifestyle.

In spite of the foregoing caveats, *the usual low density suburban built form has some definite advantages in regards to encouraging physical activity.* Although it tends not to support “active” modes of transportation, it does encourage outdoor recreational activity to be integrated into the lifestyle. Parks, open spaces and often bike trails are planned at convenient distances, large back yards promote gardening and playing, low traffic volumes make the street safe and quiet, and so on. This is certainly one of the reasons that this built form is very popular.

It can be argued that many of these benefits are also achievable in well designed, ground-oriented, medium density housing, but it must be recognized that in terms of built form densities there is some trade-off between encouraging active transportation and active outdoor recreation.

The positive correlation between access to, and use of, natural areas, parks and facilities for physical activity has been widely recognized for some time. It is important to continue to organize the built environment so that a sufficient quantity and variety are provided.

The existence of private yards or common spaces in residential developments are a key influence on active living.

2.3 Barrier-free Access to Buildings

When they climb the steps and open the door to a public building, people in good physical condition don't have to even think about how difficult that simple act can be for the many people who aren't. Twenty years ago the Canadian built environment presented serious physical barriers to people with lesser bodily mobility. That was recognized as a limitation to active living, and was corrected to the point that it is largely taken for granted now.

The International Year of Disabled Persons in 1981 focused attention on the physical access barriers to public buildings which were experienced by people with a disability. It was common at that time for the building entrance to be a set of stairs, for the door to be too narrow for a wheelchair, for the elevator commands to be beyond the reach of a person in a wheelchair, and for washrooms, meeting rooms, and public transportation to be similarly unadapted to physical disabilities. (Government of Canada)

Since then, most public buildings have been modified with ramps, automatic doors, accessible elevator buttons, wheelchair access to washrooms, and so on. Transit stations are equipped with elevators, and some buses even have steps that lower to the sidewalk. In many localities sidewalks are sloped to meet the road surface at intersections. Building codes have been revised to require these measures in new buildings, and a number of books and guidelines have made the technical information widely available. (CMHC 1992)

These improvements benefit people of all ages, for example parents with baby strollers, people recovering from injuries to their legs, older people with mobility limitations, delivery services with hand-carts, and so on. They allow everyone the dignity of equal access and inclusion.

Finally, when elevators provide “vertical transportation”, it is common for the architectural design to discourage the option of taking the stairs. Stairways are too often treated as an emergency feature, placed in a less convenient location on the floor plan and given a lower quality decor.

It is essential to ensure that buildings, sidewalks and public transportation provide barrier-free access.

It is important to encourage the use of stairways as a legitimate and attractive alternative to elevators.

This is a good case study of how it is possible to change the built environment to encourage active living through small, incremental, affordable modifications.

■ 2.4 Pollution and Accidents

If the environment is not safe, then outdoor physical activity will have negative consequences. Exposure to environmental risks from the built environment must be minimized if active living is to be encouraged. By extension, if people fear for their health or safety, they may refrain from outdoor physical activity. The following are the most common factors and the means by which they can be controlled.

Air Quality

This is a potentially very serious issue, because whenever air quality is below standard Health Canada advises people (especially people with respiratory problems) to avoid physical exertion. (Health Canada 1997) With rising concerns among the public about air pollution, people may be less inclined to exercise outdoors, or to integrate walking and cycling into their lives.

On the day of the air quality alert, no short term built environment response is possible. Rather, long-term prevention is required. Engine exhaust is the largest single source of outdoor air pollution. Engines operating in stop-and-go traffic, or over short distances, tend to consume more fuel and release more emissions per kilometre. (Environment Canada 1993) This can be controlled at source through emission controls, and/or by modifying the built environment to foster greater use of public transit, walking and cycling. The heat, hot water and air conditioning for buildings make a smaller but significant contribution to emissions. (Natural Resources Canada) Again, the long term response is through the building code, which regulates insulation standards, which lower the amount of energy consumed, and hence the emissions.

Exposure to localized air quality problems that would affect physical activity in the built environment can be avoided by locating residential areas, parks and recreation fields away from point sources such as major highways or heavy industries.

Water Quality

Municipal and private sewage treatment facilities maintain water quality, which is important because when the quality falls below safety levels, beaches are closed, depriving people of the opportunity to swim. (Environment Canada 1996)

Noise

Excessive outdoor noise discourages outdoor activity. The primary built environment noise sources are road and air traffic. (OECD) The federal government regulates aircraft noise and publishes guidelines on soundproofing housing in the vicinity of airports, railways and roads. Some municipalities establish noise by-laws. Exposure to localized noise problems that would affect physical activity can be avoided by locating residential areas, parks and recreation fields away from point sources such as major highways or airports.

Road Accidents

This is a special concern for those who walk and ride bicycles. In a recent survey, 53% of Canadians indicated that they believe cycling is dangerous because of vehicle traffic, and traffic safety was cited as a major barrier to people who consider cycling. (Go for Green) Motor vehicle collisions with vulnerable road users tend to be one-sided affairs, in which the vehicle and its driver are seldom at risk. Therefore transportation designs which increase the safety of cyclists and pedestrians will encourage active living. Examples are wider sidewalks, climate protection, bicycle lanes on roadways and separate trails. In the same survey noted above, dedicated bike lanes were a significant factor in encouraging people to take a bicycle to work. (Go for Green)

Pollution and the fear of accidents inhibit outdoor physical activity. The built environment is a source of these factors, but a planned environment can keep the problem within acceptable limits.

2.5 Security from Crime

Crime, or the fear of crime, is an inhibitor of active living. (Cragg et al; Craig & Russell) 25% of Canadians felt unsafe walking home at night in their neighbourhood according to the 1990 *General Social Survey*. (Statistics Canada) In a 1995 survey in the Greater Toronto area the most important factor in personal quality of life was security from crime. (GTCC) *When security considerations persuade people not to venture out at night, or to keep their children away from public parks, that reduces active living.*

The perception of crime is as important as the actual risk in inducing or inhibiting activity. The rising *fear* of crime and violence in society and the *perception* that it is becoming more common exceed statistical increases in the actual crime rate. Indeed, according to several statistical indicators crime rates are decreasing for Canada as a whole, and Canada is a relatively safe country. (Embleton; CMHC 1995a)

This is an issue with a very significant gender difference. Most crimes are committed by men and most assaults are by men on other men. But more women are assaulted by men than vice versa and women express significantly greater fear of crime than men. (CPVAW; GTCC)

There is a well developed literature on how to modify the built environment to discourage crime. This is called Crime Prevention Through Environmental Design (CPTED).

The presence of people on the street or circulating in a given area is a major inhibitor of crime because the potential perpetrator realizes that their chances of being caught are higher. For the same reasons, an active people presence is also a contributor to the *feeling* of security, an indication that an area is safe. (McIlroy & Bryan; Nelson & Faulkner; Wekerle & Whitzman)

It is possible to modify the built environment to reduce crime by improving visibility and encouraging casual surveillance by the general public, so-called “eyes on the street”. The placement of doors, windows and landscaping to allow clear view lines to a

building from the street has a dissuasive effect. Lighting maintains the effectiveness at night. In turn, the neighbours have to be able to see out of their buildings onto the street, which means that windows facing the street are desirable and garages in front of houses are undesirable from a safety standpoint. (Hunter; McIlroy & Bryan)

In enclosed, automobile-oriented environments like parking garages and transit stations, cameras can substitute for the casual surveillance described above, and emergency telephones increase peoples’ comfort level. (Wekerle & Whitzman) In uninhabited areas like parks, parking lots and business zones, the monitoring function can be done by passing pedestrian and vehicular traffic. (McIlroy & Bryan; Nelson & Faulkner)

A street or building complex where there is a feeling that the buildings relate to the street



When security considerations persuade people not to venture out at night, or to keep their children away from public parks, that reduces active living.

and parking areas creates a sense of local control or “territory” on the part of the residents or users that will discourage the criminal element. Conversely, large, anonymous, featureless and especially windowless spaces signal an area that is uncontrolled, which tends to attract more crime. (McKay) One study found a correlation between juvenile delinquency and the size of the building and its city block, with larger sizes having more juvenile crime. (Fowler)

Neighbourhood layouts which encourage pedestrians discourage crime, for example having local destinations like corner stores and recreation facilities in residential areas. Design features such as benches, flower beds, and good lighting are also positive features. (McIlroy & Bryan; Nelson & Faulkner)

Having a variety of housing types to attract a variety of lifestyles and age groups is an advantage. For example, senior citizens are more apt to be at home and on the street during the working day, and young adults add evening street life. Neighbourhoods which have sufficient population to encourage public transit benefit from an informal security patrol by the bus drivers. Having housing in the downtown area makes that part of the community safer. (McIlroy & Bryan; Nelson & Faulkner; Wekerle & Whitzman)

The link between the detailed features of the built environment and security from crime are of interest to this discussion paper for two reasons.

The specific one is that improving security will improve people’s tendency to engage in outdoor active living.

The general one is that, in the literature survey that led to this paper, this was the best documented example that the detailed architectural design of buildings as well as the general planning layout of a town or city have a direct effect on human behaviour.

■ 2.6 Social Networks

The socio-cultural environment is a determinant of health and physical activity. (Health Canada 1998) **The built environment has an influence on the formation of social networks.**

As noted in the previous section on safety and security, the design and layout of streets and buildings, the homogeneity or mix of land uses, the architectural detail of doors and windows and landscaping all influence people’s tendency to be on the street, to congregate, and therefore to possibly interact with each other.

Donald Appleyard, in a frequently referenced study on the influence of street and housing design on the interaction among neighbours, showed that the number of visits between neighbours was inversely proportional to the volume of motor vehicle traffic on the street. (Appleyard et al)

Variations in the physical contexts of communities have been shown to influence the leisure behaviour of adolescents (McMecking & Purkayastha) and adults (Oldenburg) The larger the number of attractive potential contact points the greater the socialization (for example, more people living in an area, the presence of shopping malls, cafés or community centres



A community that benefits from volunteer organizations and groups is more likely to support lifestyles supportive of fitness.

as contact points) In one study, physical fitness and sports facilities and outdoor trails facilitated the creation of social contacts. (Gottlieb) In another study, children in small, walkable towns enjoyed more personal mobility and watched less television than children in a suburban area. (Kay)

Labonté (1994) showed that a community that benefits from volunteer organizations and groups is more likely to support lifestyles supportive of fitness. Alexander (1977) noted that reliance on the automobile and tract style housing negatively affects per capita participation in voluntary organizations and civic affairs. Fowler (1992), in a study on Toronto, concluded that the classic suburban built form produces less social interaction than a mix of land uses

and densities. Day (1990) found that social networks and the sense of community are improved when there is a variety of housing types in the same neighbourhood, so that people can move to accommodate lifestyle changes without leaving the area. Large single land use zones, by definition, do not allow for a complete community.

High density areas (especially high rise buildings) result in reduced social interaction and less active living. Although one building or a complex of buildings may house as many people as a village or a neighbourhood, the vertical form is not as conducive to social relationships [as anyone who travels in an elevator will realize]. In high-density living, the availability of communal or public spaces and parks is

crucial to encourage recreation and social activities. (Oldenburg; Day; Fowler) And it is also important that there be a sense of ownership of these spaces by local residents, as revealed in studies on crime and safety in the preceding section of this paper. If the spaces are anonymous or felt to belong to the wider city, they do not achieve the same success. This requires spaces with carefully defined private and semi-public zones. (Langdon)

Vehicle-assisted mobility permits a person to spread his or her activity patterns, work locations, and consumer choices over a large geographic area. This personal form of freedom was unknown in previous times and is one of the wonders of the modern era. Electronic and telecommunications devices from the telephone to the internet allow people to spread their “virtual” activity patterns over an even broader geographic area. However, this way of life may decrease opportunities to develop a localized sense of geographic community. The impacts of this on active living have not been evaluated.

Paradoxically, because most cities are organized for automobile transport, those persons without a car who live in areas with poor transit service become socially isolated. This especially applies to seniors, youth and the disabled as well as homemakers. (Active Living Go for Green; Hayden; Environment Canada 1993).

In summary, a supportive built environment for social networks would include:

- a mix of land uses;
- opportunities to socialize and congregate, both outdoors and indoors, including physical activity places;

- encouragement of walking, cycling and public transit (refer to sub-section 2.1);
- “eyes on the street” and other safety measures (refer to 2.5).

In addition to the foregoing, to reinforce the “geographic community” of local neighbourhoods:

- a mix of residential types in any one neighbourhood; and
- low traffic volumes on residential streets.

■ 2.7 Winter Conditions

Snow and extreme cold inhibit all forms of mobility, both “people power” and vehicular travel. In a recent survey, “weather” in general (although not winter in particular) was an important barrier to people walking and especially cycling. (Go for Green)

Snow removal and other mitigation techniques, which have a direct impact on active living, are a matter of public policy. To some extent the needs of the various modes of transportation are in conflict, at least immediately after a storm. For example, snow banks from street and parking lot clearance may block sidewalks. The placement of buildings near the street protects pedestrians but may hamper snow removal efforts. If the snow clearance policy gives priority to pedestrians and public transit, these forms of transportation will be reinforced. The City of Montreal, for example, encourages cycling even in winter by clearing its system of dedicated bike lanes. There are techniques to make the built form more conducive to physical activity in winter. (Matus; Pressman) A compact urban

form reduces distances travelled. Appropriate design, for example placing vegetation and buildings near the street, provides wind protection and avoids pedestrians crossing open areas. Sidewalk designs can include storage areas for snow, be level, and have a grained surfaced to provide greater traction.

Tall buildings generally increase the gusting of winds. Detailed studies of a proposed building in the context of the neighbouring buildings allows the introduction of wind breaks.

Toronto and Montreal have complemented their subway systems with underground pedestrian passageways between buildings in the central business and shopping area. Calgary has an above-grade system known as “plus 15”. Winnipeg, Ottawa, and other cities have a more limited number of connections of these types. Although expensive in terms of construction cost, they favour pedestrian movement in winter conditions. Climate controlled environments such as shopping centres make it easier for those with mobility limitations to be active during the winter months.

Winter physical activity patterns are partly a matter of social values. Many Canadians enjoy the seasonal variations in outdoor activity, while others avoid them. Winter presents unique opportunities to be active, such as skating, skiing, and the ubiquitous snow shovelling.

Winter is a hindrance to active living in most parts of the country, but mitigation techniques and protected passageways can improve the microclimate in urban areas. Policies on snow and ice removal influence the safety of pedestrians and cyclists.

3.0

Opportunities to Increase Active Living Through Changes to the Built Environment



■ Introduction

Having demonstrated that the built environment influences active living, it follows that it is possible to change the built environment to encourage people to improve their health by integrating physical activity into their lives.

As noted in the preceding section, a built environment that would encourage the integration of physical activity into the daily lifestyle would have:

- compact medium density land use zones, and/or a greater mix of compatible and complementary land uses within each zone (to shorten the distances and allow more people to walk, bike, or use public transit);
- housing that is ground-oriented (to encourage gardening, playing, and casual social contact among neighbours);
- light traffic only on residential streets;
- dedicated bike lanes along major streets or separate paths through parks;
- the preservation of natural areas, and the provision of parks and recreation facilities; and
- a clean, safe, and “barrier-free” environment.

Note that “compact” does not have to mean high density. It is possible to retain most of the active living advantages of “ground oriented” housing (e.g.-private yards) in medium density, mixed use formats which avoid many of the active living disincentives of low density and high density.

The following are examples of recent trends that may not necessarily be based on active living, but which would have the result of encouraging it just the same. It is interesting to note that while each approach has a different motivation, most of the examples promote a similar built environment.

3.1 New Urbanism, also known as Neotraditional Design

In the last few years some new subdivisions have been built with compact form and pedestrian friendly environments. Sometimes this is called “new urbanism” to reflect the change from the usual approach. Others call it “neotraditional planning” because in many respects it is similar to pre-war development. It is often accompanied by housing designs that are intended to be friendlier to the street, such as front porches, ground-oriented medium density and similar examples. (CMHC 1994; RMOC 1996a)



In the last few years some new subdivisions have been built with compact form and pedestrian friendly environments.

This raises the point that quality of design becomes very important in medium density conditions. Attention to architectural detail, layout, street design, ground orientation, human scale, the provision of neighbourhood level community spaces, and even street lighting are important factors.

Snow is often considered a restrictive factor for new urbanism. Compact designs have less room for on-site snow storage, resulting in larger snowbanks and subsequent snowdrifts, or in greater costs of snow removal. The costs decrease the infrastructure savings from compact development. There have been some experiments with improving the performance of our cities in winter conditions to reduce ground level wind speeds and snow drifting. (Pressman)

Although some new urbanism projects include mixed land use, including employment opportunities, commercial or community services, many don't. Since new subdivisions are normally built on vacant land at the edge of the city, most new urbanism residents end up with an auto dependent lifestyle.

New urbanism, or neotraditional design, is an improvement to the conditions for active living that has good potential. Its potential is greatly enhanced when other parts of the built environment also offer potential, for example in small towns where the “edge” is not so far from the “centre”, or when this approach is used near an employment area. **Perhaps equally importantly, the success of these projects with new home buyers demonstrates that many people would prefer this option if they were given the choice.**

3.2 Alternative Transportation Oriented Development

The Transportation Association of Canada has developed a new vision for urban transportation that has been endorsed by the



70% of Canadians indicated they would be willing to travel up to 30 minutes to work if they could enjoy the safety and convenience of a bike lane.

Federation of Canadian Municipalities and many other associations. The vision includes compact, mixed land use development that makes alternative transportation modes more feasible. (TAC) The central parts of our large cities, dating from before the Second World War, already share these characteristics. A recent review of some of the attempts to build this way in suburban areas is cautiously optimistic. (Southworth) Transit-oriented developments are built adjacent to rapid public transit lines, and place the neighbourhood core of stores and services at the transit station.

The Canadian Institute of Planners has a detailed guidebook to help communities integrate bicycles into their transportation and land use planning. (Hope & Yachuk) In a recent survey, 70% of Canadians indicated they would be willing to travel up to 30

minutes to work if they could enjoy the safety and convenience of a bike lane. (Go for Green)

The short term and life cycle costs of owning a car in comparison to public transit are often underestimated. One study in Ottawa found that the lower cost of housing in suburban and rural areas was more than offset by the cost of commuting by car, dramatically so if the urban dweller could rely totally on public transit and not own a car. (RMOC, 1996a)

Professor Peter Newman of Murdoch University in Australia has been popularizing some intriguing research done for the United Nations Commission on Human Settlements, the World Bank and the Organization for Economic Cooperation and Development. (Newman & Kenworthy 1998) His speeches

and papers summarize a number of international comparisons on the subject of built form, particularly as it relates to transportation.

The research shows that there is no obvious gain in economic efficiency from developing automobile dependence in cities. There are, on the other hand, associated costs in terms of greater energy consumption, poorer air quality, and more deaths from road accidents. In addition, public transit systems in auto-dependent cities are less cost-effective, requiring larger subsidies. There is a correlated reduction in non-motorized transportation (walking and bicycling). The reverse of all this is true for cities which rely heavily on public transportation. On an international scale, Toronto, Montreal and to a lesser extent Vancouver rank in the middle according to various criteria, generally performing better than American cities and not as well as European and developed Asian cities.

Transportation planners are beginning to see the advantages of an alternative built form, one that happens to be compatible with active living.

■ 3.3 Infill, Retrofit and Reurbanisation

These are three approaches to modifying the existing built-up area (as opposed to new subdivisions on the edge of town).

Infill: refers to the insertion of a new building or buildings between existing ones, usually in an older area of the city or town. In most cases, it is necessary for cost-recovery reasons to build at higher densities than the surrounding area, which contributes to a more compact city.

Retrofit: refers to the redesign of existing infrastructures. For example, during bridge reconstruction it is often possible to introduce a bicycle lane where one did not previously exist, at only minor marginal cost. The success of barrier-free design (Section 2.3) is a good example of retrofit.

Reurbanisation: refers to the intensification of land uses in older parts of the city, especially to the introduction of residences in former industrial or commercial areas, including older abandoned industrial facilities. (Berridge et al) For example, the City of Toronto conducted a “Housing on Main Street” design competition to encourage new development along commercial streets, chiefly above the stores and offices at street level. (City of Toronto) These streets have good public transit service, reducing automobile dependency.

Infill, retrofit and reurbanisation offer the potential to create an environment more conducive to active living within the existing built-up area of the city or town.

■ 3.4 Traffic Calming

This form of “retrofit” focuses mainly on the re-design of existing streets. It began in Holland with the “woonerven” or “living yards”. The authorities placed car parking, plants and street furniture on the margins of the paved area of existing streets. This induced drivers to slow down to walking speeds. Sidewalks were blended with the street such that pedestrians mixed with the low-speed cars. Interestingly, this made the street safer from accidents, as well as more attractive to socializing, and more secure from crime due to the resulting “people presence”.



Traffic calming has the potential to improve safety for pedestrians and cyclists, to encourage social contact by making the street environment more attractive, and as a result of both discouraging crime.

Canadian-style traffic calming is generally not as radical an intervention, partly because of snow removal considerations. It tends to use speed bumps, all-day on-street parking, or street corners that narrow to facilitate pedestrian crossings. In some older areas with grid streets, some streets can be selectively closed or made one-way to automobiles while allowing pedestrians and cyclists through.

Traffic calming is not intended to be applied to major traffic streets, but to residential or shopping areas where the objective is to give priority to pedestrians over cars. (CART)

Traffic calming has the potential to improve safety for pedestrians and cyclists, to encourage social contact by making the street environment more attractive, and as a result of both discouraging crime.

3.5 New Retail Patterns

The dominant trend in retailing is toward larger “big box” stores totally based on automobile access. There is some tentative evidence of a counter-trend. (Both the dominant trend and the counter-trend are more exaggerated in the USA.) Certain retail chains and franchise operations are

establishing their market niche in main street style pedestrian and transit-oriented environments. New technologies are allowing governments to establish decentralized customer service centres or kiosks that are suitable for these environments. (Altoon)

The implications of this counter-trend, if it is confirmed, could be to allow more active transportation to more localized service outlets.

Other built environment changes that could lead in the same direction are the availability of delivery services for those without cars, storage facilities for bicycles at shopping centres, and, as noted below, home based businesses and telecommuting.

■ 3.6 New Work Patterns based on New Technologies

The advent of the personal computer, facsimile machines, and electronic mail have allowed a recent but significant change in work patterns. Increasing numbers of people “telecommute” by connecting their home computer to the employer’s central computer rather than going to the workplace.

Others operate “home-based businesses”: the space required for some small businesses has decreased to the point that they can fit in the home because the computer performs tasks for which it was formerly necessary to have employees.

The impacts of new technologies are still being evaluated. As a minimum, they reduce the need to commute to work and

other forms of travel. (CMHC 1995c)

In the case of home based businesses, this could result in a demand for support services such as office supplies and photocopying being located closer to the residential area, thus introducing mixed uses within walking distance. (Zastrow) That would encourage active living. Both home based businesses and telecommuters might tend to use personal services and shopping nearer to home, with the same effect.

On the other hand, this new phenomenon could contribute to urban sprawl and motor vehicle dependence if teleworkers decide that not having to commute allows them to locate even further out on the margins of the city. (Hollinshead)

■ 3.7 The Planning and Development Process

In Canada, the built environment is not a random occurrence, it is planned. Most of the planning is done by municipalities, with influences from the other levels of government. The private sector and the for-profit real estate market play a major role.

Municipalities are responsible for preparing official community plans. These are future-oriented policy documents that indicate the proposed locations of various land uses, and major roads. The purpose of the plan is to provide a long term public policy framework for the short term decisions of governments and the private sector. The plan generally seeks to provide a variety of living environments to allow the residents and businesses a choice, within a framework that provides for the public good in an environmentally, fiscally and socially

responsible manner. The ultimate goal is to achieve a “desirable” built environment, with the desirability being defined and refined through public policy. (Richardson)

The planning and development process is conducted in public in most jurisdictions. Public meetings are held to discuss proposals and options. Plans are adopted by the elected municipal council. In some provinces it then has to be approved by the provincial government.

Therefore, it is possible to influence the public policy process of formulating urban and regional plans, in favour of built environments that favour active living.

[See Appendix 2 for a more detailed description of the planning system.]



. . . the built environment is not a random occurrence, it is planned. Most of the planning is done by municipalities, with influences from the other levels of government.

4.0

Societal and Political Trends Which are Opportunities for a Built Environment Conducive to Active Living

Changing the built environment is a complex challenge. The proverbial bricks and mortar are the visible result of underlying systems such as land use planning and real estate development. The previous section contains examples of trends and experiments in that regard.

The public policy and private market systems respond over the long term to the social attitudes and desires of the public - as voter and as consumer. They also respond to national and international trends, the overall state of the economy and to new scientific discoveries. This section of the discussion paper presents examples of the beginnings of attitude shifts that are favourable to a built environment that is conducive to active living.

4.1 Evolving Public Opinion

In a 1995 Canadian survey, drivers said they would be willing to walk or cycle more if the conditions were favourable. (Environmental Monitor) This was confirmed in a 1998 Environics poll which showed that 82% of Canadians would *like* to walk more and that 66% would like to bike more, especially if there were more bike lanes. (Go for Green)

In a 1995 survey in the greater Toronto area, there was broad support for having a mix of housing types in residential areas. (GTCC) Many of the solutions proposed by environmental activists and alternate lifestyle proponents are supportive of improved active living outcomes. The experiments in new built forms described in the previous section were tested in the marketplace.

According to popular demographer David Foot, shifts in population age and accompanying lifestyles should make the central areas of the city with better public transit and compact mixed use built form more popular housing locations, both for young persons looking for smaller, affordable housing and older persons looking for the sophistication of cultural activities. (Foot)

In a recent survey, 82% of Canadians surveyed indicated they would support more government spending on bike lanes, a significant finding in a time of fiscal restraint. (Go for Green)



In a 1995 Canadian survey, drivers said they would be willing to walk or cycle more if the conditions were favourable.

Public opinion and consumer preferences seem to be relatively more favourable to built forms that support active living than in the past.

4.2 Sustainable Development

In Canada it has been feasible to build a low density sprawling built environment for the past fifty years. Sustainable development is about considering current action in terms of its long-term effects, and it is about considering the actions of each country in terms of the planet. The World Commission on Environment and Development, better known as the Brundtland Commission, defined sustainable development as “meeting the needs of the present without compromising the ability of future generations to meet their own needs” (WCED 1987, p 8).

The world’s population is growing, and therefore the consumption of resources is increasing. The material standard of living in many countries is rising, which also increases consumption. (WCED; United Nations 1992) Although Canada’s population is growing more slowly, our rate of consumption is still increasing. The average size of dwellings has almost doubled between 1951 and 1991 although the average number of people living in each dwelling has decreased. (CMHC 1993) Canadians consume and create waste at five times the rate of persons in less developed countries. We practice the 4 R’s (reduce, reuse, recycle and recover) less than they do. (Ramphal)

The values held by a society have an influence on consumption: whether human development only means increases in economic production and the standard of living, or whether it includes less tangible considerations like quality of life and spiritual

values. (Ramphal; WCED; WHO) A balanced approach promotes economic vitality, environmental integrity, and social well-being. This balance must not only be achieved in a Canadian context, but also globally so that our way of life is not maintained at the expense of other countries. A more sustainable form of built environment would be as follows:

- compact in form, resulting in lower transportation and construction costs, which in turn reduces pollution and the consumption of resources of all types;
- mixed land uses where they are compatible, again to reduce transportation;
- facilitate walking and cycling and increased use of public transit, which consume fewer non-renewable resources;
- reduce waste volumes by following the 4 R's: reduce, reuse, recycle, recover;
- consume less land for urban uses, thus preserving more environmental areas and open spaces in a natural ecosystem, and preserving agricultural land as a food resource. (Roseland)

This more sustainable form of urban development would have many of the features that encourage active living.

4.3 Infrastructure Affordability

Currently, all levels of government are reducing and rationalizing their expenditures. There is a real possibility that the infrastructure costs of the extensive low density urban form, which on balance has many disadvantages for active living, will not be affordable in future fiscal regimes. Infrastructure refers to the basic services that

are needed to keep a society running. Hard infrastructure includes services that are delivered physically, such as drinking water, sewage and roads. Soft infrastructure includes services that are delivered by people, such as recreation and policing. (CMHC 1995b)

During the post-war years of rapid growth a high proportion of the infrastructures were new, which meant they did not require significant maintenance or replacement. In 1985 the Federation of Canadian Municipalities published a landmark study which predicted that Canadian municipalities would not be able to maintain their aging infrastructures at acceptable standards and affordable tax rates over the long term. This gap would initially lead to a reduced quality of life and economic performance of urban regions. If this situation were not corrected, it could eventually lead to direct health risks. (FCM)

One solution is to reduce cost through increased density. For example, when a subdivision of typical single family houses is compared to duplexes, the single family homes require at least four times more linear metres of public services in the form of water pipes, hydro cables, roads and other infrastructures. (CMHC 1991) Locating developments within the existing built up area, by “infilling” vacant lands or redeveloping from singles housing to multiples, takes advantage of existing infrastructure. As noted previously, if more travel were done by walking, cycling, and public transit it would reduce road maintenance costs. These solutions have begun to be reflected in planning documents and growth strategies. (RMO 1996b; Government of Ontario)

New fiscal realities will provide an incentive to reduce land consumption and reduce infrastructure and transportation costs through increased density. This would result in a more compact built form, with many advantages for active living.

■ 4.4 Kyoto Agreement on Reducing Greenhouse Gas Emissions

At the Kyoto summit on Climate Change in 1997, Canada promised to cut its greenhouse gas emissions by 6% below 1990 levels, by the year 2008-2012 (United Nations 1997).

Motor vehicle transportation generates more greenhouse gas emissions than any other sector, over 25% of the total and growing (Natural Resources Canada, p.4). These

gaseous byproducts are significant contributors to urban air pollution, and secondary effects such as acid rain and global climate change. It is estimated that approximately one billion dollars a year in health care costs could be saved if low emission vehicles became common, and if sulphur and benzene in fuel were reduced. (Health Canada 1996)

A technological solution may be sought by controlling emissions. A so-called “transportation demand management” solution would reduce travel, in part through the design of the built environment. The average car makes 2,000 trips per year of 3 kilometres or less and on a short trip a cold engine generates more emissions than a warm one (Go for Green, p.2).

Promoting active transportation can be part of the strategy for reducing greenhouse



The National Forum on Climate Change recommended, among other things, designing communities to reduce commuting distance and increase walking and bicycling.

gases. This provides an argument to improve health outcomes through public transportation, which reduces emissions when many people travel in one large vehicle. (CMHC 1993; 1995a) It is an even stronger argument for encouraging walking and cycling, which do not contribute to air pollution. It is not surprising, therefore, that the National Forum on Climate Change recommended, among other things, designing communities to reduce commuting distance and increase walking and bicycling. (NRTEE)

In terms of greenhouse gas emissions from the heating and cooling of buildings with fossil fuels, single family dwellings and free standing buildings are the least energy-efficient. Buildings with common walls, floors and ceilings are more efficient. This can also be an argument in favour of compact built form.

One solution to respecting the Kyoto Agreement is to modify the built environment in ways that favour active living.

5.0

Key Determinants: Towards a Conceptual Framework of the Connections Between the Built Environment and Active Living

While Section 2 of this paper dealt with demonstrations of the effect of the built environment on active living, and Sections 3 and 4 discussed trends that could be favourable towards active living outcomes, this section is conceptual. During the researching and writing of this paper the following elements of a theoretical framework suggested themselves to the authors, inspiring the title of the paper, *Fitting Places*.

What constitutes a good “fit” between the built environment and an active orientation towards life? We think the following five factors are the keys to a built environment that is good for active living.

■ 5.1 Proximity

When urban functions exist within a reasonable distance from each other there is more likely to be an “active” response from the user. The pre-automobile city evolved in response to the land market, transportation system and planning function of that time: it was compact in form. The automobile allowed the distances to lengthen considerably, but travel by car is not active living. For those without a car, or reasonable public transportation, the longer distances have actually reduced their access.

Taking the example of recreation facilities, passive open spaces and small parks are scattered throughout the urban area, whereas large parks and natural areas are less frequent, and there may only be one “sportsplex” per medium-sized municipality. Thus the “facility” where one “exercises” the hardest will not be easily integrated into a daily routine without a car, whereas walking the dog can be. Experience shows that integrated physical activity is more likely to be practiced over a lifetime, therefore there is an advantage to having those opportunities in proximity. Other examples noted in this paper are having shopping and workplaces near residential areas.

5.2 Scale or Intensity

Zoning by-laws separate functions based on the incompatibility of land uses, which is a way of saying that some things should not be placed in proximity. In classical separations, residential uses are in one area, industrial in another and commercial in another. In the modern era compatibility has more to do with the *scale* of the building or the *intensity* of the traffic it generates than with the land use category. A small light industry or office use that is innocuous in appearance and creates no pollution and little traffic is compatible with a residential area. A large apartment building occupied by people with a vibrant singles lifestyle might be more compatible with an industrial use than with other residential uses. An arrangement of land uses that measures compatibility according to scale and intensity would allow a mix of uses conducive to active living. Another effect of scale is that large buildings and roadways tend to discourage social contact and informal physical activity, whereas low scale (sometimes called “the human scale”) encourages these.

5.3 Complementarity

Separating land uses based on incompatibility is an effective defensive measure. The positive approach would be to seek synergy by grouping certain land uses that reinforce each other when placed in proximity at the appropriate scale. A classic complementary arrangement is the location of schools in residential areas, where they reduce transportation needs and contribute to community life, both of which contribute to active living.

5.4 Safety and Attractiveness

As noted in several places in the text, if the environment is unsafe, polluted or unattractive, it will not induce active living lifestyles. Environments that are attractive tend also to be safer from crime.

5.5 Convenience

This factor is less tangible than the first four, and has more to do with cultural values. In the dictionary, “convenient” means “fitting” or “suitable” and comes from the Latin for “coming together.” But in common parlance “convenience” has come to describe an absence of effort or the saving of time.

So using the car is considered a convenient way to travel. Many people use this “convenience” to live in a location that requires them to spend a chunk of their day battling traffic and a significant part of their income on automobile expenses. It may seem more “convenient” to hire someone to shovel the snow so we have time to go curling. These are caricatures of course, and are not meant to ignore the various personal reasons for commuting, or the pleasures of car ownership. Rather, the lesson is that the active living alternatives will have to be as “convenient”, in both the original and the colloquial sense of the word, in order to be popular.

An ideal built environment for active living would optimize the foregoing factors.

6.0

Recommendations for Action



This section makes recommendations on how the findings of this discussion paper can be used to influence the built environment so that health outcomes improve through active living.

■ 6.1 Strategic Leadership and Policy Development

The proponents of active living have to put this issue on the agenda. The various governments, professions, and associations with the most influence on the built environment are not generally aware of the health implications, and the health care costs, of *inactive* living. Consequently, they have not considered how they could contribute to improved health by changing the built environment.

There are three main targets:

- a) making the health field aware of the influence of the built environment;
- b) making the urban planning and development field aware of the health issue; and
- c) making the public aware of both.

In terms of the leadership message, this paper has given numerous examples of how a built environment conducive to the integration of physical activity into peoples lives would also be beneficial to the existing priorities of many organizations. Some examples are energy conservation and pollution avoidance, lower infrastructure costs, and reduced crime costs. There is the potential for a convergence of interests.

Recommendation:

Health Canada and NGO partners in the field of active living should take the initial leadership to:

- circulate this discussion paper to national organizations and federal ministries with mandates in health, urban development, transportation, recreation and sustainable development;
- call a meeting or hold a consultation to discuss its recommendations; and

- propose joint policy development and implementation.

In a subsequent consultation, involve their provincial equivalents.

The goal of this initial leadership effort is to form partnerships and alliances with influential agencies, groups and organizations to identify practical actions and implement them. The general public is best reached through community mobilization and promotion/encouragement. Finally, knowledge development and dissemination will ensure fact based interventions. These strategies are outlined in the following subsections.

6.2 Partnerships and Alliances

This issue is intersectoral in nature, therefore the recommendations cannot be implemented by any one organization or agency. Strategic partnerships and alliances are clearly called for.

This includes other federal departments and agencies, especially CMHC, Transport Canada and Environment Canada which have an influential policy and information role in the built environment.

Since the constitutional jurisdiction for urban planning is provincial and most plans are prepared by municipalities, it is recommended that those governments and their agencies also be engaged in discussion.

Examples of other influential bodies are quasi-governmental agencies in the urban planning and development field such as the

Intergovernmental Committee on Urban and Regional Research and the Centre for Sustainable Transportation. Associations such as the Federation of Canadian Municipalities and the Transportation Association of Canada need to be involved. Professional bodies who should be more aware include the Canadian Institute of Planners, the Canadian Council of Professional Engineers, the Royal Architectural Institute of Canada and the Canadian Society of Landscape Architects. Among the associations representing the land development industry are the Urban Land Institute, the Canadian Homebuilders' Association and the Canadian Construction Association. To this list must be added universities and research organizations.

Organizations that are already advocates should be included. For example there are walking and cycling organizations such as the Canadian Cycling Association and the Canadian Volksmarch Association, as well as recreation organizations such as the Canadian Parks and Recreation Association. Go for Green has an active living mandate.

Strategic alliances within the sustainable development umbrella would put "health" issues on the agenda by another name. This approach was used to good effect in the past by with such initiatives as Healthy Communities, Environmental Citizenship and Crime Prevention. *The authors consider it urgent to influence the terms of the debate in this regard.* For example, technological solutions to automobile pollution through reduced emissions have a beneficial health impact but do not increase integrated physical activity, whereas solutions that reduce automobile usage carry active living

benefits. Many people who are environmentally aware are motivated to make lifestyle choices that support the environment. The Canadian Environmental Network and the National Round Table on the Environment and the Economy are examples of organizations that should be approached in this regard.

Finally, health professionals, particularly those in health promotion, are potential allies once they understand the importance of influencing the built environment for improved health outcomes.

6.3 Community Mobilization

The built environment, as a determinant of active living, has not been widely understood by the general public. On the other hand, Canada has been a leader in the

development of innovative community participation in issues. The following approaches all recognize the inter-related nature of the environmental, economic and social factors that promote the good health of the population, and they all depend on collective community action in cooperation with governments: sustainable development round tables, healthy communities projects, and community economic development. The Active Living in Communities pilot projects are another example. These types of approaches should be encouraged because individual lifestyle change is not enough to change the system, and because they unleash the power of volunteerism. Furthermore, the solutions to this question will have to be implemented in local communities, and community mobilization is an excellent complement to the efforts of the (mostly national) organizations referred to in 6.2.



On the other hand, Canada has been a leader in the development of innovative community participation in issues.

6.4 Promotion and Encouragement

While leadership, information and partnerships also perform a promotion and encouragement function, there is a need for targeted promotion to reach the public. Media campaigns and other forms of social marketing are costly but effective.

The form of the built environment is partly a result of consumer preferences, and it is important to inform consumers as part of the overall effort. Certainly, Canadians receive a great deal of commercial advertising which encourages behaviours that are not conducive to active living. The Canadian consumer has not yet been asked to explicitly consider the relationship between the built environment and health. Recent surveys do indicate changing attitudes that should be more receptive to the message, at least in some segments of the population.

6.5 Knowledge Development and Dissemination

Although the built form is a physical construct, it has interconnected sociological, economic and environmental dimensions. The scientific research on the impacts of the built environment on human behaviour is mostly behavioural science. The reaction to a given physical environment may vary over time, from one culture to another, and certainly there is a wide variation among individual persons. Many of the references used in this paper are from the literature on urbanism and human settlements, something of a departure from the majority of active living publications. Much of that literature is based on observation, experience, and behavioural studies. It is not done in

laboratories and it can rarely be done in anything resembling a controlled experiment. As noted in *Improving the Health of Canadians Through Active Living* (Health Canada 1998, p.9) “while studies on the precise impact of the physical environment on activity levels and on interventions designed to modify the physical environment are still relatively scarce, it is clear that these factors are very influential in encouraging or inhibiting physical activity.”

In the literature survey conducted for this discussion paper, there were very few references to “active living” other than those published by Health Canada and active living NGO’s. In the literature on urbanism, there are relatively few studies aimed explicitly at measuring the impact of the built environment on physical activity or active living, although as noted above it is often one factor among others. This indicates that planners, engineers, architects and other professionals have not been made sufficiently aware of the importance of this subject to the health of Canadians.

On the other hand, as noted in Appendix 3, there is no shortage of research leading to constructive criticism of the existing built environment, and much of it recommends modifications that would encourage active living.

Recommendations:

- 1) **The existing evidence about the built environment-active living linkage needs to be packaged and disseminated.** The following are some examples.
 - The health care costs of inactivity. For example, the total direct cost of obesity was more than \$1.8 billion in 1997, or

2.4% of total health care expenditures in Canada that year (Birmingham et al, 1999). This type of information is urgent and should be brought to the meetings/ consultations recommended in 6.1.

- The benefits, in financial, environmental and health terms, of alternative modes of transportation to the automobile.
- Short term and life cycle personal costs of car ownership, and long term environmental costs to society
- How to participate in the public process of preparing official community plans, in order to increase the priority given to active living and the built forms which support it
- Publicize recommended standards for urban design that supports active living, including such subjects as:
 - ▶ design standards for new urban development, including winter climate considerations
 - ▶ retrofitting of suburbs and central areas
 - ▶ performance based zoning (which tolerates a greater mix of uses)
 - ▶ transportation demand management
 - ▶ community gardens for housing projects and grouped buildings
 - ▶ indicators of conducive environments
 - ▶ environments that are good for crime prevention and active living
 - ▶ practical information on improving the conditions for walking and cycling in all seasons, including the

maintenance of sidewalks and roads, and consumer information on methods.

- This discussion paper is only an introduction, and no doubt a number of other linkages between the built environment and active living could have been added to Section 2. The meetings/ consultations recommended in 6.1 should be invited to add linkages to the list, especially those which are easily documented or of special interest to other partners.

2) To improve the evidence base on the link between the built environment and active living, original research oriented specifically to this subject is needed. Examples include:

- A paper similar to this one on rural and small town environments that are home to about one third of Canadians.
- Settings-based research, showing how the location and design of schools and workplaces influence active living.
- Research with respect to sub-groups, such as gender and age groups, to see if they react differently to built environments.
- An exploration of the impact of working from the home on active living.

Note: because urbanism is in part a behavioural science, community-based research and/or participative research will be necessary.

7.0

Summary and Conclusion



Active living, defined as the integration of physical activity into the daily lives of Canadians, is good for health. This report can be summarized into six main findings about the built environment and active living, as follows.

1. **The most important finding of this discussion paper is to confirm that the built environment is one of the determinants of active living.** This is an important contribution to an understanding of the role of the built environment in people's proclivity to integrate physical activity into their lives.
2. **A built environment that encourages the integration of physical activity into the daily or weekly lifestyle has the following features:** a mix of complementary land uses within each district; and/or compact medium density development; housing that is ground-oriented; no heavy traffic on residential streets; bike lanes and/or paths; the availability of "active" modes of transportation (walking, cycling, public transit); the preservation of natural areas and the provision of parks and recreation facilities; and a clean, safe, "barrier-free" environment.
3. **Many individual features of the Canadian built environment are supportive of active living:** our towns and cities are relatively attractive, safe, clean and barrier-free. Low density suburban areas encourage outdoor physical activity.
4. **However, the greater part of most cities and towns are arranged in a way that discourages people from travelling on foot or by bicycle.** Canadian towns and cities, especially the suburban parts, are not usually compact or do not have mixed land use districts. This also limits the relative attractiveness of public transit, which is considered an "active" transportation mode.
5. **A conceptual framework** summarizing the key concepts underlying the connections between the built environment and active living indicates that **an ideal built environment for active living would optimize the following five factors: proximity, scale, complementarity, safety, and convenience.**

6. **There are a number of recent trends that provide opportunities for improvement.** Systemic forces tend toward the status quo. However the planning of the built environment is conducted in a democratic public policy environment which can be influenced. This was demonstrated by the elimination, over the last twenty years, of physical barriers to access to public buildings for people of limited mobility.

Conclusion

Actions can and should be taken to improve the health of Canadians by making the built environment more supportive of active living. A foundation to do so already exists. To achieve lasting results will require the involvement and commitment of many sectors of society working in partnership to develop a vision of how the built environment can sustain active living. There is no shortage of opportunity to effect positive changes through the synergy of decision-makers, communities and citizens working together to integrate physical activity into daily life.

8.0

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APPENDIX 1

Historical Overview of Urban Development and Health



Canadian cities are generally cleaner and healthier today than in the past. There were many health problems in the mostly unplanned growth of towns and cities in the late nineteenth and early twentieth century. Overcrowding and improper sanitation allowed communicable diseases to spread quickly. Uncontrolled pollution affected the quality of drinking water.

The response of the civic leaders of the day was to introduce piped water and sewers as well as garbage disposal. Mandatory building and fire codes improved housing standards. Zoning was invented to ensure that new residential areas were kept away from noxious industrial areas by grouping similar land uses into single use zones and by separating incompatible land use zones from each other. (Sherwood; Wolfe). Zoning also created minimum standards for the provision of yard space. Public parks were established to provide greenery and recreation. These measures, along with improvements to medical treatment and nutrition, allowed the health of the population to improve significantly.

Although most towns and cities grew slowly during the first half of the twentieth century, the new single use zoning and the separation of incompatible land uses meant people had to travel farther to work. Public transportation was introduced, usually some form of rail tramway.

World War Two and the post-war years saw the accelerated industrialization of the economy and a relative increase in incomes. There was a population migration from the country to the city, a “baby boom” increase in the birth rate, and foreign immigration to urban areas. These factors combined to create massive growth in cities and towns that has lasted over fifty years. The other key component of this period was the emergence of the automobile as an affordable means of travel. (Wolfe)

Prosperity, cars and zoning combined to create what came to be the standard post-war suburban form. The new suburbs featured single use zoning of predominantly single family housing, and lot sizes were larger than in the older parts of town. Employment was either in industrial parks or downtown. As the suburbs grew, work was further away, but the commuting was accommodated by the construction of new expressways.

New commercial and personal services were grouped in shopping centres, which were separate from the new industrial areas, but again the automobile provided convenient access. Community facilities and parks were provided throughout the area. This approach tended to draw inhabitants from a similar socio-economic and demographic profile. The older grid pattern of streets, which had allowed cars to shortcut through neighbourhoods, was replaced by curving boulevards, crescents and cul-de-sacs designed to channel traffic away from local streets to major arteries.

As the automobile became the dominant mode of transportation, it was given priority over pedestrians and cyclists, resulting in a “retrofit” of older areas of the city: parking lots were placed in front of new buildings, which meant pedestrians had to walk farther. Trees were cut and sidewalks narrowed so that the streets could be widened, which exposed pedestrians to the weather and traffic.

The cumulative result was a city form with large areas of homogenous social and physical characteristics, spatially separated, with mass use of the car. The Canadian urban form responded well to the problems of the previous era, and in that regard is a definite success. However, it also has clear disadvantages with respect to the barriers it poses to walking and cycling as serious modes of transportation.

APPENDIX 2

Details on the System for Planning the Built Environment



The most familiar planning tool to the general public is usually zoning. Virtually every municipality has zoning by-laws, which control the use of the land on each property, as well as the size and location of buildings on the property. *Zoning says what is legally permitted now.*

Of equal or greater significance to the land use planning system, *official community plans say what should happen in the future.*

Official community plans are adopted by municipal governments to provide for orderly development in the public interest. They usually have maps showing residential, commercial and industrial areas. They may provide further detail on the location of low and high density residential, shopping centres and downtown business areas, or schools and parks, for example. They can go into a great level of detail about the design of the community. (Richardson)

A plan generally has policies and explanatory materials to describe goals and standards for long term development. For example, the official community plan can indicate whether the policy is to promote low density automobile oriented housing, or a mix of land uses in neighbourhoods oriented to walking, cycling and public transit, or some combination of approaches. The plan can establish guidelines for protection from noise and other environmental hazards. It can establish policies to integrate environmental areas into the built environment or to preserve them separately. It can set standards for roads, sidewalks and other infrastructures. The plan can list goals for the environmental, social and economic health of the community.

A number of more precise legal instruments are used to implement the goals of the official community plan in detail. Zoning is the most important. Subdivision approval procedures control the location and width of new streets, the size of lots, the planting of roadside trees and the type of infrastructure. In many jurisdictions there is also a very detailed level of site specific control that can allow the municipality to approve the location of parking lots, noise barriers, the planting of vegetation, exterior lighting and so on.

Municipalities generally do not control the architectural features of buildings, such as colour and finishing materials, and for individual houses they normally do not control windows and door locations, plants and landscaping, parking and other similar details. Policies on the indoor environment are mainly enforced through the building code.

Most of the land in southern Canada is in private ownership, and land owners have a very important influence on built form. The construction of buildings and facilities is primarily undertaken by the private sector for an economic return, within the limits established by the plans and regulations of the municipalities. (Cullingworth)

Land developers have to consider consumer preferences and the short term sales market, as they affect their particular piece of land, in order to make a profit. This is a different motivation than the long term public good that is expressed in the official community plan. It is not unusual for the developer to propose modifications or variations to the existing plan.

Provincial governments adopt the legislation that gives municipalities the legal authority to plan. Some provinces also have broad planning policies that municipalities are required to consider in preparing local plans. (Cullingworth) The Federal Government does not have a direct role in community-wide plans in southern Canada, but it has a major impact through its ownership or regulation of such things as airports, railways, ports, and national parks and

historic sites. The environmental, social and economic policies of many government departments influence the built environment. In northern Canada where most of the land is owned by the government as Crown land, until relatively recently the Federal Government did virtually all the planning. This has evolved toward much greater involvement of the Territorial governments and First Nations. (Richardson) The built environment is also influenced by other agencies, including public housing corporations and transit authorities.

APPENDIX 3

Reflection on the Dominant Built Form



The authors would like to preface this section by acknowledging that, for the sake of brevity, this discussion paper has presented an overview of the dominant post-war built form with an emphasis on automobile dependent suburbs. An overview is always a simplification of reality. First of all, significant areas of Canadian towns and cities were built before the war. Secondly, there have been experiments and sub-trends, some of which may be considered counter-trends. In the last decade or so the built form has become more complex; for example, one of the difficulties facing public transit is the migration of employment from a concentrated pattern in the central city to a dispersed pattern including suburban and fringe locations. Finally, not all towns and cities are the same.

The modern era of reflection on the influence of that built environment on human behaviour and community health began as early as 1961 with *The Death and Life of Great American Cities* by Jane Jacobs. Post-war suburbs began to be built in the USA earlier than in Canada, and Jacobs was the first to note some less fortunate side effects.

Jacobs' observation of urban and suburban lifestyles and the way in which cities were built led to the conclusion that areas with a mix of business and residential uses, small to medium scale buildings, medium density housing and a variety of social classes were more likely to encourage people to be active within their neighbourhood. These characteristics were typical of older central city neighbourhoods and small towns, not the newer suburban areas. This came as a shock to the urban planning profession and Jacobs' findings were unpopular for many years.

There was a time lag following Jacobs' critique, but subsequent studies confirmed and expanded on the basic findings. Doxiados (1972) introduced the idea of appropriate scale, showing that each urban function is best provided at a particular scale (e.g. street, neighbourhood, city) and that each form of development must balance personal choice with collective travel distance. Alexander (1977) deals with the architectural design of buildings and shows how they can influence the propensity to socialize and be active.

Some authors question whether the suburban style of development, well adapted to the conditions in which it was created, has been perpetuated in the face of conditions which make it less satisfactory to the lifestyle of its inhabitants. (Leung 1994) For example, in the 1960's the typical nuclear family consisted of a working father, a housewife and several children. Today the incidence of single parenthood and young/older couples without children is much higher, the number of children per family is lower, and both members of a couple are usually commuting to work (Hayden).

Rybczynski (1995) provides an interesting review of a type of suburban development in the pre-automobile era. It performed the same function of providing larger, greener environments for housing, and transporting workers to the central city (there were virtually no suburban industrial parks at that time). But since the mode of transportation was commuter trains, the neighbourhood environment was more pedestrian oriented. To be fair in the comparison, the housing sizes and lot sizes were smaller than the standards of the 1950s through 1970s. (Lot sizes, though not necessarily house sizes, have decreased since the 1980s as costs have risen.)

There is also a paradoxical aspect to what is known as urban sprawl. Hirsch (1978) notes that the first people to move to the fringe of an urban area benefit from the proximity to the rural environment and a reasonable commuting time. But as others pursue the same goal by leap-frogging development outward, the benefit is substantially reduced:

the original fringe is no longer near the edge of the city, and residents of the new fringe have to commute over longer distances.

Finally, the whole basis of the separation of “incompatible” land uses and the grouping of similar land uses has been questioned. When the economy was based on noisy heavy industry emitting noxious fumes it was important to proceed in this manner. However, much of the modern economy is knowledge-based, and the state of the art in noise and pollution controls is such that much of the original motivation has disappeared. It could make more sense to emphasize synergy and complementarity among land uses through a “performance-based” zoning, i.e. to make the separation of land uses based on the intensity of the activity, the size of the building, the hours of operation, the ability to control the undesirable side-effects, and so on.

Notes on the Differences between Canadian and American Built Environments

Since the English language literature is dominated by American publications, it is important to mention that their approach to city-building is somewhat different than ours. In part, this is a matter of time lag and size: we are able to learn from their experience, and their largest cities are larger than ours. There are also cultural and governance differences between the two countries. On the whole, Canadian society has been more tolerant of the mixing of classes, ethnic groups and races. Our tradition of “peace, order and good government” has meant that urban and

regional planning for public policy objectives plays a stronger role in preventing excesses than does the unfettered free market tradition and emphasis on individual rights in the USA.

Canada is a leader in the development of the metropolitan or regional form of government, which allows the central city and the suburbs to be planned and managed as a whole and forces the residents to confront collective problems. In the USA most metropolitan areas have a multiplicity of municipal jurisdictions and weak or absent regional coordination. In many cases this has led to the serious deterioration of the central city area. (Cullingworth)

As a result of these differences, Canadian cities are more compact and have better public transit with a lower level of car usage. (Newman & Kenworthy 1988; 1998) They are consistently ranked above American cities in terms of quality of life. They have a lower crime rate. (Foot)

APPENDIX 4

Evolution of the Conceptual Framework of Health to Include the Built Environment

The understanding of what constitutes “the environment”, and its relationship to health and active living, has become broader and more complex over time. An example of early concerns is the provision of parks and recreation facilities that encourage physical activity. Another example would be the impact of drinking water quality or air pollution on health. In such examples the definition of the environment tends to be the natural environment, and the attitude tends to be that it is a place where people go to be active, or that it is a separate entity that impacts on us. There is a growing realization that the most influential physical environment for the health of Canadians is the one in which most Canadians live: towns and cities. Society is increasingly aware that we live within our environment, in an interactive relationship. This appendix traces that evolution in thinking.

The 1970's

Our current understanding of health can be traced to a landmark document, *A New Perspective on the Health of Canadians* (1974). Better known as “The Lalonde Report”, it was issued by then Minister of Health and Welfare Marc Lalonde. It marked the beginning of the modern era in which health is seen as a positive state that can be promoted by such means as lifestyle change and risk aversion; whereas formerly health was understood as the absence of illness or the elimination of disease through the intervention of the medical care system. Of interest to this discussion paper is the emphasis on Environment and Lifestyle as two of the four themes in Lalonde's health field concept. (Health and Welfare 1974)

The Lalonde report has had a significant and lasting impact on health professionals, including Health Canada staff, and it has enjoyed considerable international currency as well. It was a paradigm shift and, following a period of integration into the mainstream, new approaches and new programmes became inevitable.

The 1980's

A number of such initiatives came in the 1980's. *Achieving Health for All* was adopted by Health and Welfare Canada in 1986. Its policies called for improvements to health status through the creation of

health-promoting environments, as well as changes in lifestyles and health services. (Health and Welfare 1986)

The first international conference on health promotion was held in Ottawa in 1986. It adopted the *Ottawa Charter for Health Promotion* (WHO), which defines health promotion as the process of enabling people to increase control over, and to improve, their health. The Charter sees health as a resource for daily living, including physical, mental, and social well-being. That is the same integrative, positivist approach used in the definition of active living. The Charter also introduced the concept of “determinants of health”: the underlying factors that influence an individual's ability to maintain and enhance health.

Using the determinants of health framework, the Canadian *Healthy Communities* network was funded by Health Canada for several years beginning in 1988. (Hancock) Healthy Communities promotes better health by encouraging people to work together to improve the common elements of the economic, social and environmental health of their community. The publication *A Healthy Community is an Active Community* (Fitness Canada), underscored the mutually reinforcing aspects of healthy communities and active living at the community level.

The 1990's

The latest evolution in the thinking about what determines health is contained in the 1994 *Strategies for Population Health: Investing in the Health of Canadians*, endorsed by the federal and provincial/ territorial Ministers of Health. (Health Canada 1994) A population health approach differs from traditional medical care thinking in two main ways.

Population health strategies address the entire range of factors that determine health, rather than focus on risks and clinical factors related to individual diseases. Population health strategies are designed to affect entire populations (including supporting those who are healthy) rather than dealing one at a time with people who are ill or at risk. Population health promotes good health as a positive state that is a resource for living, and not merely the absence of disease. The strategies are based on a determinants of health approach which recognizes that while the medical care system is essential to restoring health when a person is ill, much of what makes a person healthy or unhealthy are underlying environmental, social, economic, and genetic conditions.

The following are the nine most important determinants of health according to the *Strategies for Population Health* document, in no particular order:

- Income and Social Status
- Social Support Networks
- Education
- Employment and Working Conditions

Physical Environments

- Biology and Genetic Endowment
- Personal Health Practices and Coping Skills
- Healthy Child Development
- Health Services

Physical environments are defined to include the human-built environment such as urban and rural community design. Although all of the determinants are inter-related to varying degrees, as explained in this paper the physical environment influences two other

determinants in particular. These are personal health practices and coping skills, which include social environments that enable and support healthy choices and lifestyles, and social support networks including support from communities.

Another example of the shift is that Health Canada's *Vital Link: Health and the Environment in Canada* (1992) dealt with the potential for contaminants in the natural environment to present health risks, or with health and safety concerns in specific settings such as the workplace. The successor publication *Health and Environment: Partners for Life* (1997) adds a new chapter on the built environment.

Evolution of Active Living to include the Physical Environment

The Active Living concept also emerged from the paradigm shift represented by the Lalonde Report, which included lifestyle as a means to a positive state of health. Active Living has its roots in the physical fitness movement, including such government initiated programmes as ParticipACTION. The 1986 Summit on Fitness in Ottawa adopted a broad meaning of fitness as a state of total well-being of the individual-- physical, mental, emotional, spiritual and social. This was further developed by Health Canada in post-conference consultations, and described in *Active Living: A Conceptual Overview* in 1989, revised and reissued under the same title in 1991. It gives the definition of active living which is still in use: "a way of life in which physical activity is valued and integrated into daily life". The active living concept takes a holistic approach that goes beyond the mechanical movement of the body to encompass the entire physical activity experience. This includes the physical,

mental, emotional, spiritual and social dimensions of physical activity. It is a state of being as well as a state of doing.

The implementation of active living programmes like Active Living, *Go for Green!* are oriented to individual and collective action. Their mandate is to be a catalyst for social change toward active living to improve the health and well-being of the population. Their goal is that active living be so integrated into our lives that it is part of what it means to be a Canadian.

A brief 1995 report called *Linkages: Built Environment, Well Being and Active Living* was the first active living publication to make the connections among the built environment, active living and health. It emphasized recent trends and physical activity outcomes. It demonstrated the desirability of pursuing the physical environment as an area of enquiry. (Active Living Go for Green)

In 1996 Health Canada and Active Living, *Go for Green!* commissioned a literature survey on the built environment and active living, prepared by the authors of this discussion paper. That literature survey confirmed that the built environment is a determinant of active living, for the reasons explained in this paper.

In a 1998 document *Improving the Health of Canadians Through Active Living*, Health Canada lists the Physical Environment as one of four Determinants of physical activity initiation and maintenance. (The others are the Socio-cultural Environment, Individual Attributes, and Policy and Supports.) The report presents evidence of the links between physical activity and positive health outcomes.