



HEALTH & THE BUILT ENVIRONMENT

SUMMARY

“People cannot be healthy in unhealthy communities.”

Capital Health, Edmonton Area, 2007

How cities and neighbourhoods are designed and built impacts our health. Changing how communities grow and develop can help achieve healthier communities by improving air quality, increasing opportunities for physical activity and social interaction, and decreasing road injuries and fatalities.

Some of the ways cities can support healthier lifestyles include:

- placing well-designed higher density developments in appropriate locations;
- encouraging mixed-use developments, with restaurants and shops close to homes;
- providing frequent and convenient transit;
- connecting streets to reduce travel times and provide more direct routes;
- incorporating traffic calming devices to slow traffic; and
- providing facilities for active transit, including sidewalks and cycling lanes.

The built environment could help address the Edmonton region’s changing population and health trends, including an aging population, increasing commute times, and worsening air quality. Health professionals and institutions, including The Centre for Disease Control and Prevention in the U.S and Alberta Health Services, Edmonton Area recognize this connection. “When so many of our patients have the same problems, we must realize that poor health is not caused only by a lack of discipline, but may be the result of the built environments in which we live.” (Capital Health, Edmonton Area, 2007)

St. Albert is proposing Smart Growth Regulations in the annexed lands. Smart Growth St. Albert would facilitate the development of neighbourhoods and districts where people can walk, cycle or take transit to the store, restaurants, or work safely and in a time efficient manner. With more transportation options, pollution and accidents will likely be reduced, and physical activity increased. Smart Growth St. Albert will build healthier neighbourhoods by:

- developing Neighbourhood Activity Centres, which will provide local retail, restaurants and other services within a five minute walk from homes;
- ensuring well-designed and appropriately located density (townhouses and apartments) to support frequent and convenient transit, and neighbourhood retail; and
- developing safer and more efficient streets for pedestrians and cyclists, by connecting streets and providing sidewalks and cycling lanes.

To Read:

Neighbourhood walkability linked to weight is a brief article looking at how neighbourhood design impacts physical activity and ultimately obesity.

Find it at:

<http://www.medicinenet.com/script/main/art.asp?articlekey=91435>

To Watch: Healthy Places video reviews how community design can impact our health, in terms of physical activity, pollution, and social and mental health.

Find it at:

http://www.cdc.gov/healthyplaces/cdc_healthy_community_design_webserver/video_h.htm

To Discuss:

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Places to see:

Richmond, CA is among many communities in the San Francisco Bay Area struggling to address public health issues ranging from air pollution, water and soil contamination, pedestrian and bicyclist safety, and chronic diseases. Many of these issues are related to the built environment. To address these issues, Richmond is one of the first cities in the country to develop a comprehensive general plan element that links public health and the built environment. The project was funded by The California Endowment (TCE) (Healthy Communities by Design, 2007).

The articles and videos referenced in the Bulletins do not necessarily reflect the position of the City of St. Albert and are meant to encourage debate and discussion.

HEALTH & THE BUILT ENVIRONMENT

INTRODUCTION

The World Health Organization defines health as “a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.” How neighbourhoods and cities are designed impacts our health, in terms of:

- Air quality
- Physical activity
- Social and mental health
- Road injuries and fatalities

Changing how communities grow and develop can help us achieve healthier communities. This brief will explore how city and neighbourhood design impacts health, the health implications of the built environment, and how Smart Growth St. Albert will support healthy neighbourhood design.

CITY DESIGN AND HOW IT IMPACTS HEALTH

The placement and design of streets, homes, shops and parks impacts our health. Neighbourhoods and districts can support healthier lifestyles by:

- placing well designed higher density developments in appropriate locations;
- encouraging mixed-use developments, with restaurants and shops close to homes;
- providing frequent and convenient transit;
- connecting streets to reduce travel times and provide more direct routes;
- incorporating traffic calming devices to slow traffic; and
- providing facilities for active transit, including sidewalks and cycling lanes.

Density

Density is a means of measuring the intensity of development. For residential density, it is measured as persons per hectare or dwelling units per hectare. To support retail, services, jobs and transit within walking distance of households, there are suggested density thresholds.

Table 1 - Density requirements to support various activities

To support:	You need a density (within 5-10 min walk) of:
Convenience store	17.5 dwelling unit per hectare
Small supermarket	45
Bus service at 30 minutes intervals	20
Transit station	50
High frequency transit (10 minute intervals)	75

Source: Source: <http://www.epa.gov/dced/pdf/density.pdf>

The portion of residents that walk and cycle at least 30 minutes a day increases with land use density, from 11% in low density areas up to 25% in higher density areas (Litman, 2008). Suburban developments generally have low densities, with fewer people on larger lots, resulting in greater distances from stores, transit stops and jobs. St. Albert has an overall neighbourhood density of 10 du/ha, contributing to challenges in providing frequent transit, and retail clustered along St. Albert Trail, as opposed to within walking distance of homes.

About 80% of vehicle trips are generated for shopping, errands, chauffeuring and recreation, as opposed to commuting (City of St. Albert, 2009), there is a great opportunity to reduce the number of vehicle trips by supporting neighbourhood-based retail, as seen by the number of trips by St.

Albert residents of this sort outlined in Table 1. In St. Albert, the average number of one way trips in one week is 20.8.

Table 1 – Weekly vehicle trips by St. Albert residents

Purpose of trip	Number of one way trips per week
Shopping, errands and appointments	6.6 trips
Recreation and entertainment	6.2 trips
Work	6.0 trips
School	2.4 trips

Source: City of St. Albert, 2009

Mixed-use Development

Mixed-use development refers to the combination of different land uses, such as retail, offices, residential, parks and schools together. By mixing land uses, people are more likely to walk or cycle to the store, work or school. For retail development, more small shops and services near to where people live will attract more walking trips than a few large shopping centres or a mall. (Frank, Kavage and Litman, ND) St. Albert has some mixed-use development located in the downtown, and some older neighbourhoods like Grandin and Akinsdale include small neighbourhood commercial sites. However, most new neighbourhoods are entirely residential.

Transit

Efficient and frequent transit close to home encourages people to take the bus as opposed to driving. Frank, Kavage and Litman (ND) cite a study that found for every ¼ mile increase in distance from a transit stop to a home, the odds of taking transit decreased 16%. As a result, residents of transit-oriented neighbourhoods own 10-30% fewer automobiles and drive 10-30% fewer miles than residents of automobile-oriented neighbourhoods (Litman, 2008)). In St. Albert, residents on average use transit for 2.9% of trips (City of St. Albert, 2005).

Figure 1



Source: www.lightrainnow.com

Easily accessible transit stops close to different uses increases the likelihood of people using transit.

Connectivity

Connectivity refers to the directness of links and the density of connections in a path or road network. (Litman, 2007) Places with good connectivity have frequent intersections, short block lengths and minimal dead ends such as cul-de-sacs. As a result, there are more route options, and travel times are shorter

for pedestrians, cyclists and vehicles. People are generally willing to walk 400m and ride a bike up to 1.5 km (Crandall and Arambula, 2009).

Traffic Calming

Traffic calming devices can increase the safety of streets for pedestrians, cyclists and drivers. Speeding in the U.S played a role in 31% of all fatal crashes in 2002 (MassSAFE, 2004). A variety of speed control measures can influence driver's speed, including lane width, pavement markings, and compact intersections. These speed controls can alter the perception of drivers (passive speed measures), or the physical driving environment. Passive speed measures involve modifying edge lines and

Figure 2



Source: C. Bergum

Measures such as these chicanes, parked cars or trees along streets give the illusion of a narrower street and slow traffic, reducing accidents.

centre lines, and are generally unobtrusive and inexpensive. Wiltshire, Great Britain removed their pavement lines, removing cues that make drivers feel safe at higher speeds. As a result, serious crashes dropped by one third and speeds dropped by up to seven mph since the lines were removed (MassSAFE, 2004). It is estimated roundabouts, a type of traffic calming device, reduce car crashes by 39% and injury by 76% (Stone, Chae and Pillalamari, 2002).

Facilities for Active Transportation

Providing facilities such as well-designed, continuous sidewalks and cycling lanes is critical for encouraging alternative modes of transportation, and daily physical activity. In Portland, eight percent of city streets have cycling infrastructure, but these attract 51% of cycling trips, even if the route was not the shortest (Jim Redden, 2008). In Canada, only 10% of trips are made by walking or cycling, versus 40% of trips in Denmark and the Netherlands where extensive facilities are provided (Ontario College of Family Physicians, 2005).

IMPACTS OF CITY DESIGN

Physical Inactivity

Physical inactivity can affect lung function, cardiovascular and immune systems, and bones and muscles. It also significantly increases the risk of obesity. Obesity is a serious issue in Canada, with half of the population classified as overweight, and one in six considered obese. In 2000/2001, the costs to the Canadian healthcare system from obesity was \$4.3 billion (Ontario College of Family Physicians, 2005). Obesity related deaths doubled from 2,514 in 1985 to 4,321 in 2000 (Ontario College of Family Physicians, 2005). Obesity is linked to cardiovascular disease, cancer, diabetes and osteo-arthritis.

Figure 3



Obesity is becoming one of the leading causes of disease and illness and is a significant contributing factor in increases

50 point increase in the degree of sprawl (Surface Transportation Policy Partnership, 2002). According to Alberta Health Services (2008), physical activity could be increased 31% by land use mix, density, access to destinations and transportation infrastructure (i.e. bike lanes).

About half of the Capital Region's residents do not get enough physical activity (Alberta Health Services, 2008). With fewer children walking or biking to school, less than half of Canadian youth are active enough to ensure proper growth and development.

How cities are designed can provide opportunities for people to gain their physical activity by walking or cycling to the store, work, or school. For example, the number of calories burned weekly by walking to and from school is the equivalent of two hour-long classes of Physical Education (The Centre for Sustainable Transportation, 2005). 60% of Canadians indicated they would walk more often if safe sidewalks existed close to home, schools and business (Williams, 2007).

Low-density developments are associated with less physical activity. People living in the most sprawling areas are likely to weigh six pounds more than people in compact counties, and the odds of having hypertension or high blood pressure are six percent higher for every

Road Injuries and Fatalities

"The more hours people spend driving or riding in cars increases the likelihood they will be injured or killed in a car collision." (Ontario College of Family Physicians, 2005) Road collisions are the leading cause of death of people between four and 35 in North America and kill 3,000 Canadians each year (Ontario Smart Growth Network, ND). In 2006, in the Capital Region, there were 7,451 emergency room visits, 625 hospitalizations and 67 deaths due to motor vehicle accidents. Almost 50% of all child and teen major trauma occurs at the street location (roads and sidewalks) (Alberta Health Services, 2008).

Suburbs are associated with more driving and longer trips. As a result, people living in suburbs are five times more likely to die in a road crash than people living in dense cities (Ontario Smart Growth Network, ND). Suburban roads are designed for the fast and efficient movement of cars, with

several wide lanes, higher speeds, and long blocks with few intersections. Roads designed primarily for cars are not only unsafe for cars, but also pedestrians and cyclists. "In Canada, an average of one pedestrian is killed every day on our roads." (Ontario College of Family Physicians, 2005)

According to Alberta Health Services (2008), injuries due to road accidents could be reduced 17% by land use policies and practices, better road design, urban structure and density. A study in Longmont, CO found a 485% increase in accident rates per year per mile as street widths increased from 24 feet to 36 feet (Emergency response and street design, 2009).

Air Quality

Motor vehicles are a major contributor to air pollution. Annually, over 16,000 Canadians die prematurely from air pollution (The David Suzuki Foundation, 2003). Driving creates smog, "a combination of the airborne pollutants, ground level ozone and fine particulate matter" (Ontario College of Family Physicians, 2005). Smog is linked to:

- Cardiovascular disease
- Birth defects
- Cancer
- Respiratory problems

Long-term exposure to pollution can delay lung development in children, and cause and exacerbate asthma (Ontario College of Family Physicians, 2005). In 1978, approximately 2.5% of Canadian children had asthma; now up to 20% of children have asthma. "Researchers found a five to eight percent increase in asthma and bronchitis symptoms among children exposed to traffic-related pollutants (Ontario College of Family Physicians, 2005)."

Several studies have reported a link between low birth weight and material exposure to emission during pregnancy. "Long term exposure to air pollution is associated with low birth weight, preterm birth, intrauterine growth retardation, and negative pregnancy outcomes such as miscarriages, stillbirths, and deaths in early infancy." (Ontario College of Family Physicians, 2005)

Residential proximity to major roadways has been associated with a mortality rate advancement period of 2.5 years (IBI & Dillon Group, 2003). Residents in close proximity to heavy traffic roads have increased risk of lung cancer. "Work in Denver, Colorado, found that children who live near high traffic-areas (20,000 cars per day) may be six times more likely to develop childhood leukemia and other cancers." (IBI & Dillon Group, 2003). St. Albert Trail, at its busiest intersection, carries nearly 60,000 cars per day.

By reducing the number of vehicle miles travelled, air pollution could be reduced substantially. Placing stores close to homes, and providing continuous sidewalks and cycling paths would encourage people to walk or cycle more, and drive less for shorter trips. "Short motor vehicle trips in urban conditions tend to have relatively high per-kilometre pollution emission rates due to cold engine starts and congestion, so reductions in such trips tend to provide relatively large emission reductions (Frank, Kavage and Litman, ND)."

Social and Mental Health

In suburban communities, commuters spend three to four times more hours driving than those in dense, well-planned communities (Ontario Smart Growth Network, ND). According to the Ontario College of Family Physicians (2005), commuting is linked to stress, frustration, and work absence. Road rage, one type of mental health stress, is growing and placing motorists at risk. "A review of more than 10,000 road rage incidents reported via news media, police and insurance companies, found a 60% increase during a six-year period up to 1996." (Ontario College of Family Physicians, 2005).

Walking, cycling and taking transit increases the sense of community and relationship building. According to the Ontario College of Family Physicians (2005), "for each 10 additional minutes spent commuting everyday, people spend 10% less time participating in community activities." Gilbert and O'Brien (2005) and Hertzman (2002) also suggest children's emotional and intellectual

development accelerates in more walkable, mixed-use communities (Frank, Kavage and Litman, ND). Crowhurst Lennard (2007) suggests growing up in a sprawling community reduces children's sense of responsibility, independence, self-confidence and tolerance for diversity.

The elderly and people with disabilities are often unable to drive and have limited mobility or sensory impairments that impede easy movement in urban environments. In communities with few transportation options and stores far away, social isolation can be a huge issue. According to Ontario College of Family Physicians (2005), "one large cohort study showed that living in areas with walkable greenspaces near one's residence positively influenced the longevity of urban senior citizens independent of their age, sex, marital status, baseline functional status, and socio-economic status."

HEALTH & THE BUILT ENVIRONMENT IN ST. ALBERT

The built environment in St. Albert is dominated by street design and building placement more suitable for cars than for people. Some of the older neighbourhoods have a greater degree of connectivity and access to the trail system gives people opportunity for recreational activities. However most services are most easily accessed by car.

Capital Health, Edmonton Area has published several reports on the status of various health indicators in St. Albert and surrounding areas. Some of the health trends in the Capital Region include:

- St. Albert has one of the highest incidences of obesity in the Capital Region, with 55.7% of the population overweight or obese, versus 49.1% for the regional average (Capital Health, 2002).
- Over the last 20 years, the senior population (75 years and older) has increased by 122%.
- In 2006, the most common reason adult males aged 20-44 were hospitalized was mental disorders.
- Unintentional injury, which includes motor vehicles accidents, was the leading cause of death for women and men ages 20-44 years.
- Respiratory disease is the most common reason for visiting the emergency room.
- There were six days in Edmonton where the air quality index was poor/very poor.
- Edmonton had the greatest increase in round trip commutes 60 minutes or over (Capital Health, Edmonton Area, 2007).

How cities are designed provides many opportunities to address these trends.

SMART GROWTH ST. ALBERT AND HEALTH

St. Albert is proposing the built environment in the annexed lands include neighbourhoods where people can walk, cycle or take transit to the store or work, reducing pollution and traffic accidents, while increasing opportunities for physical activity. Smart Growth St. Albert would build healthier neighbourhoods by:

- developing Neighbourhood Activity Centres, which will provide local retail, restaurants, transit stops and other services within a five minute walk from homes;
- ensuring well-designed and appropriately located density (townhouses and apartments) to support frequent and convenient transit, and neighbourhood services; and
- developing safer and more efficient streets for pedestrians and cyclists, by connecting streets and providing sidewalks and cycling lanes.

CONCLUSION

How we build our communities impacts our health. Smart Growth St. Albert would help to build neighbourhoods that support healthy living, by encouraging walking and cycling, and social interactions.

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