



The Centre for
Sustainable
Transportation

Le Centre pour un
transport durable

CHILDREN, YOUTH, AND TRANSPORT

Contents:

The concern	1
How transport affects children's health	1
Checklist for health and recreation professionals	4
How the health and recreation sectors can contribute	4
Initiatives and resources....	5

THE CONCERN

Evidence mounts as to the adverse effects on public health of transport and thus urban form. Children and youth are among those most affected by motorized transport and auto-dependent community design. Available data suggest they are adversely affected by poor air quality, by the confining effects that traffic has on their lives, and by the consequent lost opportunities to engage in physical activity and to experience the wider world.

This booklet outlines some of the key health concerns. As well, it sets out some of the things public health and recreation professionals can do to improve the health and well-being of children and youth by reducing their exposure to transport's adverse impacts.

HOW TRANSPORT AFFECTS CHILDREN'S HEALTH

References to children and youth as society's 'canaries' are not exaggerated when we consider the harm that motorized transport can have on their developmentally vulnerable bodies. As with many environmental health factors, children are especially susceptible to exposure to poor air quality, high noise levels, insufficient active transport (walking and cycling), and high risk of injury or death in traffic. They are developing emotionally, learning about their neighbourhoods, establishing habits, and discovering whether the world is a safe place in which they can be confident and independent.

Transport, physical activity, and obesity

We are now living in 'obesogenic' environments: communities, workplaces, schools and homes that actually promote or encourage obesity.

Dr. Sheela Basrur, Ontario's
Chief Medical Officer of Health²

Poor nutrition and sedentary lifestyles that revolve around television and video games have been blamed for children's reduced physical activity and rising average body weights.⁴² Recent evidence from Canada,⁴³ the United States,⁴⁴ and the United Kingdom⁴⁵ suggests that dependence on automobiles to transport children to school and leisure activities may also be a factor.



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Transportation

This booklet can help public health and recreation professionals reflect on the many impacts of transport on the health and well-being of children and youth. **Super-script numbers** point to sources detailed in a more comprehensive document *Child- and Youth-Friendly Land-Use and Transport Planning Guidelines*, available at the Centre's Web site.

“Less than half of Canadian children and youth are active enough to ensure proper growth and development.”

The following data are relevant:

- Less than half of Canadian children walk to school.⁴⁶ (Most children who live within three kilometres of school walk to school. But, enough children live farther from their schools to bring the average who walk down to less than half.)
- Less than half of Canadian children and youth are active enough to ensure proper growth and development. Among teenagers, perhaps less than 20 per cent do sufficient exercise, although the amount of physical activity by teenagers may have been increasing recently.⁴⁷
- In 1998/99, 37 per cent of children aged 2-11 were overweight, up from 34 per cent in 1994/95. These included the 18 per cent of children in this age group who were obese in 1998/99, up from 16 per cent in 1994/95.⁴⁸
- In the Greater Toronto Area—for which we have good data on schoolday travel by 11- to 19-year olds—there was much more travel as a car passenger by children and youth in 2001 than in 1986. For 11- to 15-year-olds the per-person increase was 83 per cent; for 16- to 19-year-olds it was 61 per cent (with essentially no increase in driving by this age group). For 11- to 15-year-olds, just over half of the additional trips by car were trips to and from school. They replaced trips that in 1986 had been made by transit, walking or bicycling. The remaining additional trips—i.e., trips other than between home and school—were all new trips, i.e., trips that had not been made in 1986.⁶⁹
- A UK study demonstrated that children who walk to school burn more calories than those who are driven. The number of calories burned weekly by walking to and from school is the equivalent of two hour-long classes of physical education.⁴⁹

Effects of traffic-related poor air quality, including poor in-vehicle air quality

Road traffic is the main cause of poor air quality in most urban

areas of the world and many rural areas, including in Canada. There is considerable evidence that this poor air quality harms children, including the following:

- The World Health Organization found that children may be more vulnerable to airborne pollution because their airways are narrower than adults' airways.¹³
- The same work for WHO indicated that there appears to be no threshold for ozone levels that are safe, and children are particularly susceptible.¹⁴
- Other work for WHO and for the United Nations Economic Commission for Europe (UNECE) reviewed numerous reports of significant associations between respiratory symptoms or hospital attendance and exposure to particulate matter or nitrogen dioxide, or both (two products of vehicle exhaust) in healthy children and in children with asthma or other chronic respiratory disease.¹⁵ The same work reviewed studies of non-respiratory effects, including children's mortality and adverse pregnancy outcomes.¹⁶
- 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.¹⁷
- Children living in areas of Europe and California with poor air quality have been found to have reduced lung function growth that places them at risk for future respiratory illness.¹⁸
- A Finnish study found that preschool children who were taken to day-care centres by car or bus had higher peak exposures to carbon monoxide than children who walked or who were taken by bicycle.¹⁹

The immediate cause of the higher exposures in the last finding was not clear. It could have been because car and bus journeys are longer, or because in-vehicle air quality was particularly poor. According to another report,

Elevated in-car pollution concentrations particularly endanger children, the elderly, and people with asthma and other respiratory conditions. While it receives little attention, in-car air pollution may pose one of the greatest modern threats to human health.²⁰



There's other work on this topic:

- A study of children's exposure to diesel exhaust in California, found that

A child riding inside of a diesel school bus may be exposed to as much as four times the level of toxic diesel exhaust as someone riding in a car ahead of it. ... these exposures pose as much as 23 to 46 times the cancer risk level considered significant under federal law. What's more, these troubling results suggest that diesel exhaust on school buses could contribute to respiratory problems among sensitive children, such as asthmatics.²²

- One author reviewed relevant data and concluded,

Drivers and passengers in cars may inhale up to 18 times as much pollution as people outside their vehicle, the worst occurring in slow-moving driving conditions in urban areas. Levels of benzene were found to be two to 18 times higher than ambient air and levels of carbon monoxide two to 14 times higher. Nitrogen dioxide is also higher (1-2.5 times), especially during high-speed driving on motorways and during afternoon rush hours.²³

Traffic-related fatalities and injuries

The rates of traffic-related injury and fatality are generally lower for children than for adults. Nevertheless, the following should be considered:

- Road traffic crashes are the leading cause of injury death in Canada for children over the age of one year.²⁶
- The risk of harm to a child from traffic is very much higher than the risk of harm from a stranger.²⁷
- A study in the UK found that one third of children who survive traffic crashes may suffer from post-traumatic stress disorder. Symptoms include depression, recurring nightmares, difficulty attending to school work, and fear of cars.²⁸

Keeping Children Safe in Traffic,³¹ a recent report by the Organization for Economic Cooperation and Development, outlines current risks for children in traffic, progress made towards creating safer environments, and the best practices of countries that have made concerted efforts to reduce the risk to children from traffic. Some of the

best practices include measures to reduce traffic speed, and public education for children, parents, and drivers.

Effects on emotional and behavioural development

A road traffic crash can have an extreme impact on a child's development, even if the child is not directly injured. There are more subtle effects from being in an automobile and from the effects of road traffic generally, including the effects of traffic noise. Some relevant findings include the following:

- An Australian study found that heavy traffic reduces the independent mobility of children and youth.³²
- An investigation in the UK found that opportunities and locations for spontaneous, non-structured play can be severely restricted by traffic.³³
- An Austrian study found that low-level but chronic noise of moderate traffic can stress children and raise their blood pressure, heart rate, and levels of stress hormones.³⁴
- Clear evidence on the effects of road traffic noise on the development and behaviour of young people may result from an ongoing major European Commission project (RANCH).³⁵ In the meantime, work showing an adverse effect of

"... children who live near high-traffic areas ... may be six times more likely to develop childhood leukemia and other cancers."



“The risk of harm to a child from traffic is very much higher than the risk of harm from a stranger.”

aircraft noise on children’s cognitive performance can be noted.³⁶

- A Swiss study found that half of five-year-old children who lived on an “inadequate” street “where traffic is a nuisance and menace to children at play” never played outside, and only 10 per cent played outside for more than two hours a day, mostly in play-grounds.³⁸ All five-year-olds who lived on an “adequate” street played outside, most for more than two hours a day.

- U.S. work on adult social bonds in neighbourhoods found that these were weaker according to the extent of automobile dependence of a neighbourhood’s residents (but not according to the extent of sprawl *per se*, i.e., according to how thinly the neighbourhood was populated).³⁹
- A report on a California Department of Education study suggested that physically fit students performed better academically.⁴⁰

CHECKLIST FOR HEALTH AND RECREATION PROFESSIONALS

- ✓ Include information about transport and children’s health in resources for the public
- ✓ Consider the potential role for your department in local Active and Safe Routes to School programs
- ✓ Consider strategies to promote active transport to recreation facilities
- ✓ Create opportunities for staff in health, recreation, and planning departments to work jointly on strategies and action plans that create more child-friendly communities
- ✓ Review municipal plans for development and redevelopment for their potential health impacts on children
- ✓ Consider how your department can encourage active transport for its employees (e.g., encouraging car pooling, transit, teleworking).

HOW THE HEALTH AND RECREATION SECTORS CAN CONTRIBUTE

Taken together, the above findings suggest that more attention should be given to transport’s impacts on the health of children and youth. Health and recreation professionals can contribute to efforts that reduce the dependence of both adults and children on motorized transport. Here are some suggestions:

Education. Health and recreation professionals can play important roles in public education regarding children’s health, transport, and land use planning. Disseminating information, training staff, and engaging in discussions with the general public can add to awareness of the significant issues. Public health and rec-

reation resources can outline the potential links between physical activity, obesity, and transport choices.

Contribution to Planning. Health and recreation professionals can influence policy and planning towards the creation of more liveable communities. Recognition that land-use planning has impacts on health, physical activity, and mobility is gaining considerable attention worldwide. The U.S. organization Active Living by Design, part of the University of North Carolina School of Public Health, leads efforts to demonstrate that new collaborations are needed to create environments that contribute to active living, including collaboration between public health and recreation officials and land-use planners.

“I can do more for public health by talking to planners.” This was said by Harry Rutter, a public health physician in Oxfordshire,



UK, at a workshop held in October 2003 in The Netherlands entitled *Health Impacts of Transport on Children*. He was expressing his beliefs that current transport practices in his jurisdiction are a major cause of ill health, that poor land-use planning has been a major contributor to these practices, and that land-use planners can be persuaded to do better.

Participation in, even coordination of relevant programs. In many municipalities, public health staff play a leading role in introducing and supporting Active and Safe Routes to School programs (see Initiative and Resources section below). It's possible to think of stronger roles for public health and recreation staff, including coordination of such programs and child advocacy generally.

“Solutions range from removing barriers to active transport for all people to creating incentives and opportunities for reducing society’s dependence on the automobile.”

INITIATIVES AND RESOURCES

Addressing the health issues outlined above requires an integrated and committed effort by many sectors: transport and land-use planners, educators, health and recreation professionals, parents, transit authorities, and all levels of government. Solutions range from removing barriers to active transport for all people to creating incentives and opportunities for reducing society’s dependence on the automobile. A detailed account of barriers and recommended actions may be found in The Centre’s *Child- and Youth-friendly Land-use and Transport Planning Guidelines* at www.ctsctd.org.

Programs

Safe Routes to School. Green Communities Active and Safe Routes to School program, designed for schools in Ontario, is a comprehensive and adaptable program that engages community partners in finding solutions that meet their needs. Visit www.saferoutestoschool.ca. This web site also has information about programs for youth.

Also visit:

Way to Go! School Program in British Columbia at www.waytogo.icbc.bc.ca

Go for Green at www.goforgreen.org

International site for **Walk to School** initiatives at www.iwalktoschool.org

OffRamp for Youth. A program for high school students that helps youth support sustainable transport choices and creates more opportunities for active transport. It is managed by the Vancouver-based organization Better Environmentally Sound Transportation. Visit www.best.bc.ca.

Other organizations

Safe Kids Canada. This organization provides information about keeping children safe. Its Web site includes safety tips, resources for teachers, and suggestions for advocacy. Visit www.safekidscanada.ca.

Child Friendly Cities. UNICEF’s Child Friendly Cities initiative is at the forefront of efforts to consider children’s needs and aspirations in an urban environment. The Secretariat documents and publicizes child-friendly initiatives and supports national and international networks. It addresses the needs of youth up to 18 years of age. Visit the Web site of the UNICEF Innocenti Research Centre, Florence, Italy at www.childfriendlycities.org.



MORE RESOURCES

“The present booklet is one of five being prepared by The Centre for Sustainable Transportation.”

Books

David Driskell, *Creating better cities with children and youth—A manual for participation*. Earthscan Publications, 2002.

Louise Chawla (ed), *Growing up in an urbanising world*. Earthscan Publications, 2002.

Other documents

Kids on the Move, European Commission.³⁰

Catherine O’Brien, Richard Gilbert, *Kids on the Move in Halton and Peel*. The Centre for Sustainable Transportation.³

This booklet for health and recreation professionals is one of five prepared for The Centre for Sustainable Transportation by Catherine O’Brien, Research Associate, and Richard Gilbert, Research Director. The other four are for educators, municipal officials, parents, and youth.

Enquiries about the booklets may be addressed to Catherine O’Brien at cobrien@renc.igs.net. Enquiries about The Centre should be go to Al Cormier, President, at transport@cstctd.org.



A walking school bus in Toronto

This project has been financially supported by The Ontario Trillium Foundation. The Foundation is an agency of the Ontario Ministry of Culture. It receives annually \$100 million of government funding generated through Ontario’s charity casino initiative. The Foundation provides grants to eligible charitable and not-for-profit organizations in the arts, culture, sports, recreation, environment and social



THE ONTARIO TRILLIUM FOUNDATION
LA FONDATION TRILLIUM DE L'ONTARIO

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Information for Educators



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Contents:

Education and transport	1
Checklist for educators.....	2
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How educators can help....	4
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© 2005 The Centre for Sustainable
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This booklet can help teachers, education planners, and administrators reflect on the many impacts of transport on the health and well-being of children and youth. **Superscript numbers** point to where sources are detailed in a more comprehensive document *Child- and Youth-Friendly Land-Use and Transport Planning Guidelines*, available at the Centre's Web site.

If we can build a successful city for children we will have a successful city for all people.

Enrique Peñalosa, former mayor of Bogotá, Colombia¹

EDUCATION AND TRANSPORT

Teachers, principals, trustees, school planners, and student transport planners adopt policies and make decisions that have short- and long-term effects on children's health. The policies and decisions concern matters such as selection of school sites, parking facilities, student drop-off points, and the transport of students to and from school.

School planners develop plans with the perspective that enrolment numbers may vary dramatically over a school's life. Parking and drop-off plans are often designed to deal with a maximum number of cars and school buses. Private schools, special schools, and school closures also contribute to the specific transport patterns of students, parents, and staff.

Rising transport costs and funding cutbacks have caused many school boards to reduce transport services, and even to think of getting out of the transport business. Cutbacks can lead to more active transport, i.e., more walking or cycling to school. They can also cause parents to drive children who were previously bused, resulting in more vehicles on the road, especially near schools, and greater possible harm to children's health.

Principals and teachers can have strong influences on the travel habits of children and their parents through encouraging and teaching active transport and discouraging the unnecessary use of cars. Many parts of the curriculum could allow children to learn how transport affects their health and the environment.

With the exception of the family, schools have more influence on the lives of children and youth than any other social institution. Canada's schools form the 'work-place' of 20 per cent of our population, including five million students and over 400,000 employees. Another 30 per cent of the population (parents) has a direct stake in schools through their children. Consequently, the school is a key site within the community for promoting health.

Doug McCall⁷⁶





CHECKLIST FOR EDUCATORS

“Does the School Board encourage employees’ use of sustainable transport modes to reduce adverse health impacts on children and youth and provide good examples?”

- ✓ Do current student transport plans encourage children to walk, cycle or use other modes of active transport?
- ✓ Are all the schools in the district participating in a Safe Routes to School program?
- ✓ Does the School Board encourage employees’ use of sustainable transport modes to reduce adverse health impacts on children and youth and provide good examples?
- ✓ If your school has a drop-off location, what might be the best way to discourage use of cars to move students to and from school?
- ✓ Does your school have adequate bicycle parking facilities?
- ✓ Have you considered how active transport can be incorporated into the school curriculum?
- ✓ If your school is near a busy road, or an airport or railroad, have noise reduction measures been implemented?
- ✓ If you operate a day care centre, have you informed parents about transport’s health impacts; and do you encourage active transport to and from the centre?
- ✓ Is a ‘no idling rule’ followed by cars and school buses?
- ✓ What policy or planning changes could reduce the amount of time children spend on school buses?
- ✓ Are there sidewalks throughout the neighbourhoods served by your school?
- ✓ Are there crossing guards at all intersections on pedestrian and bicycle routes to your school?
- ✓ As new schools are sited and school closures planned, is the impact of transport on health considered?

HOW TRANSPORT AFFECTS CHILDREN'S HEALTH

We are now living in 'obesogenic' environments: communities, workplaces, schools and homes that actually promote or encourage obesity.

Dr. Sheela Basrur, Ontario's Chief Medical Officer of Health²

References to children and youth as society's 'canaries' are not exaggerated when we consider the harm that motorized transport can have on their developmentally vulnerable bodies. As with many environmental health factors, children are especially susceptible to exposure to poor air quality, high noise levels, insufficient active transport (walking and cycling), and high risk of injury or death in traffic. They are developing emotionally, learning about their neighbourhoods, establishing habits, and discovering whether the world is a safe place in which they can be confident and independent.

Transport, physical activity, and obesity

Poor nutrition and sedentary lifestyles that revolve around television and video games have been blamed for children's reduced physical activity and rising average body weights.⁴² Recent evidence from Canada,⁴³ the United States,⁴⁴ and the United Kingdom⁴⁵ suggests that dependence on automobiles to transport children to school and leisure activities may also be a factor.

The following data are relevant:

- Less than half of Canadian children walk to school.⁴⁶ (Most children who live within three kilometres of school walk to school. But, enough children live farther from their schools to bring the average who walk down to less than half.)
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from 16 per cent in 1994/95.⁴⁸

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Effects of traffic-related poor air quality, including poor in-vehicle air quality

Road traffic is the main cause of poor air quality in most urban areas of the world and many rural areas, including in Canada. There is considerable evidence that this poor air quality harms children, including the following:

- The World Health Organization found that children may be more vulnerable to airborne pollution because their airways are narrower than those of adults.¹³
- The same work for WHO indicated that there appears to be no threshold for ozone levels that are safe, and children are particularly susceptible.¹⁴
- 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.¹⁷
- Children living in areas of Europe and California with poor air quality have been found to have reduced lung function growth that places them at risk for future respiratory illness.¹⁸

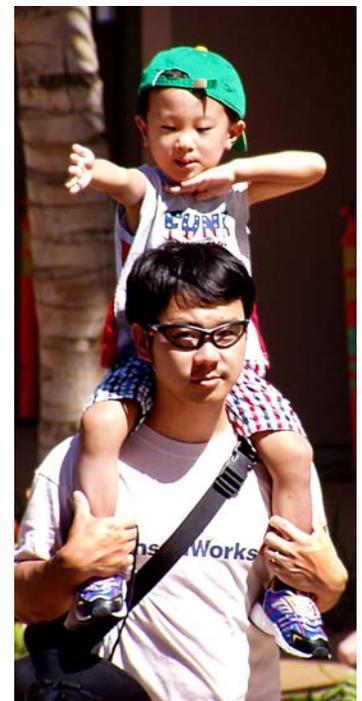
According to one report,

Elevated in-car pollution concentrations particularly endanger children, the elderly, and people with asthma and other respiratory conditions. While it receives little attention, in-car air pollution may pose one of the greatest modern threats to human health.²⁰

Other work on this topic includes the following:

- A study of children's exposure to diesel exhaust on school buses in the United States showed that concentrations of fine particulates were often 5-10 times higher than at fixed-site monitoring stations.²¹

"Less than half of Canadian children and youth are active enough to ensure proper growth and development."



“... children who live near high-traffic areas ... may be six times more likely to develop childhood leukemia and other cancers.”

- Another such study, conducted in California, found that

A child riding inside of a diesel school bus may be exposed to as much as four times the level of toxic diesel exhaust as someone riding in a car ahead of it. ... these exposures pose as much as 23 to 46 times the cancer risk level considered significant under federal law. What’s more, these troubling results suggest that diesel exhaust on school buses could contribute to respiratory problems among sensitive children, such as asthmatics.²²

Traffic-related fatalities and injuries

The rates of traffic-related injury and fatality are generally lower for children than for adults. Nevertheless, the following should be considered:

- Road traffic crashes are the leading cause of injury death in Canada for children over the age of one year.²⁶
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Effects on emotional and behavioural development

A road traffic crash can have an extreme impact on a child’s development, even if the child is not directly injured. There are more subtle effects from being in an automobile and from the effects of road traffic generally, including the effects of traffic noise. Some relevant findings include the following:

- An Australian study found that heavy traffic reduces the independent mobility of children and youth.³²
- An investigation in the UK found that opportunities and locations for spontaneous, non-structured play can be severely restricted by traffic.³³
- An Austrian study found that low-level but chronic noise of moderate traffic can stress children and raise their blood pressure, heart rate, and levels of stress hormones.³⁴
- There is some evidence from work in Austria that young people who walk to school are emotionally healthier than children who travel by motorized means.³⁷
- A Swiss study found that half of five-year-old children who lived on an “inadequate” street “where traffic is a nuisance and menace to children at play” never played outside, and only 10 per cent played outside for more than two hours a day, mostly in playgrounds. All five-year-olds who lived on an “adequate” street played outside, most for more than two hours a day.³⁸
- A report on a California Department of Education study suggested that physically fit students performed better academically.⁴⁰



HOW EDUCATORS CAN HELP

Taken together, the above findings suggest that more attention should be given to transport's impacts on the health of children and youth. Educators can contribute to efforts that reduce the dependence of both adults and children on motorized transport. Here are some suggestions:

Collaboration with parents can be particularly effective. This could be done in connection with the Safe Routes to School (SRTS) programs (contact information below). The support of teachers and principals helps ensure the success of these programs.

School closures are always a volatile issue. When arguments are presented by parents and school boards, children's health and well-being are not always at the forefront. In part this is because education budgets

and health budgets are not linked, even though education decisions influence the health of children and youth. Opportunities for active transport are often reduced by school closures. If students are then transported by bus, involving long journeys, they may also lose opportunities for extra-curricular activities and time for physical activity.

School policies and practices can encourage active transport. Secure bicycle facilities can help students who wish to cycle. Busing policies that allow students to walk in fair weather can enable students who are eligible for busing to walk more often. The U.S. Environmental Protection Agency has a program to help School Boards reduce student exposure to pollution from school buses.⁷³

“There is some evidence from work in Austria that young people who walk to school are emotionally healthier than children who travel by motorized means.”

INITIATIVES AND RESOURCES

Addressing the health issues outlined above requires an integrated and committed effort by many sectors: transport and land-use planners, educators, health professionals, parents, transit authorities, and all levels of government. Solutions range from removing barriers to active transport for all people to creating incentives and opportunities for reducing society's dependence on the automobile. A detailed account of barriers and recommended actions is in The Centre's *Child- and Youth-Friendly Land-use and Transport Planning Guidelines* at <http://www.cstctd.org>.

Programs

Safe Routes to School. Green Communities' Active and Safe Routes to School program, designed for schools in Ontario, is a comprehensive and adaptable program that engages community partners in finding solutions. Visit the Web site, which also has information about programs for youth: www.saferoutestoschool.ca.

The international Web site for walk-to-school initiatives is at <http://iwalktoschool.org>.

Active School Program. The Ontario Physical Health Education Association (OPHEA) promotes a program designed to involve

schools, parents, and students in programs for more active living. According to OPHEA's Web site, “Directly linked to the Active Participation Strand of the Ontario H&PE Curriculum, the six-level Active Schools program assists school communities in adopting, implementing and maintaining physical activity programs that support the capacity for children and youth to lead healthy lifestyles” (<http://www.ophea.net/ActiveSchools.cfm>).

Ontario Healthy Schools Coalition. The OHSC works with schools, parents, students and community agencies to foster health-promoting social and physical environments (<http://www.ppha.on.ca/ohsc/>).

OffRamp for Youth. A program for high school students that helps youth support sustainable transport choices and create more opportunities for active transport. It is managed by the Vancouver-based organization Better Environmentally Sound Transportation (<http://www.best.bc.ca>).

“... physically fit students performed better academically.”



“The present booklet for educators is one of five being prepared by The Centre for Sustainable Transportation.”

Other organizations

The Centre for Sustainable Transportation. More information about the organization responsible for the present booklet is available at <http://www.cstctd.org>.

Safe Kids Canada. This organization provides information about how to keep children safe. Its web site includes safety tips, resources for teachers, and suggestions for advocacy (<http://www.safekidscanada.ca>).

Child Friendly Cities. UNICEF’s Child Friendly Cities initiative is at the forefront of efforts to consider children’s needs and aspirations in an urban environment (<http://www.childfriendlycities.org>).

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Information for Municipal Officials



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How transport affects children's health	2
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If we can build a successful city for children we will have a successful city for all people.
Enrique Peñalosa (former mayor of Bogotá, Colombia)¹

CHILDREN'S INCREASING USE OF MOTORIZED TRANSPORT

Transport and land-use planners mostly focus on adults' needs. Children and youth are important users of transport and are strongly affected by land-use arrangements. This booklet makes the case for giving more attention to the needs of young people.

Most of the concerns about the effects of transport and land use on young people are related to their health, broadly interpreted. This booklet outlines many key health concerns. As well, it sets out some of the things municipal officials—staff and politicians—can do to improve health and well-being by reducing transport's adverse impacts and also, in some cases, by reducing the amount of transport activity undertaken by children and youth.

An indication of how much more children may be travelling by car is in the chart overleaf. On average, 11- to 15-year-olds in the Greater Toronto Area made 83 per cent more school-day trips per person by car in 2001 than in 1986; 16- to 19-year-olds made 61 per cent more trips as a passenger, although hardly any more as a driver. Meanwhile, weekday car trips by adults increased by 10 per cent. Average trip length hardly changed.⁶⁹

About 55 per cent of the additional car trips by 11- to 15-year-olds were between home and school. They replaced trips made by other modes: transit, cycling, and walking. Almost all the other trips—e.g., between school and a hockey game—were *new* trips not made in 1986.

The chart shows data for 6- to 10-year-olds for 1986 only. Data on this age group are no longer collected, partly to reduce the survey cost but chiefly because of growing unwillingness among parents to provide information about their children's travel activity.

As spelled out in the next section, young people's health can be at risk as a result of travelling by car, not the least because of the lost opportunity to engage in active transport, i.e., walking or cycling. As well, the health of young people can be worsened by exposure to transport activity generally.



HOW TRANSPORT AFFECTS CHILDREN'S HEALTH

We are now living in 'obesogenic' environments: communities, workplaces, schools and homes that actually promote or encourage obesity.

Dr. Sheela Basrur, Ontario's Chief Medical Officer of Health²

"Less than half of Canadian children and youth are active enough to ensure proper growth and development."

References to children and youth as society's 'canaries' are not exaggerated when we consider the harm that motorized transport can have on their developmentally vulnerable bodies. As with many environmental health factors, children are especially susceptible to exposure to poor air quality, high noise levels, insufficient active transport (walking and cycling), and high risk of injury or death in traffic. They are developing emotionally, learning about their neighbourhoods, establishing habits, and discovering whether the world is a safe place in which they can be confident and independent.

Transport, physical activity, and obesity

Poor nutrition and sedentary lifestyles that revolve around television and video games

have been blamed for children's reduced physical activity and rising average body weights.⁴² Recent evidence from Canada,⁴³ the United States,⁴⁴ and the United Kingdom⁴⁵ suggests that dependence on automobiles to transport children to school and leisure activities may also be a factor.

The following data are relevant:

➤ Less than half of Canadian children walk to school.⁴⁶ (Most children who live within three kilometres of school walk to school. But,

enough children live farther from their schools to bring the average who walk down to less than half.)

- Less than half of Canadian children and youth are active enough to ensure proper growth and development. Among teenagers, perhaps less than 20 per cent do sufficient exercise, although the amount of physical activity by teenagers may have been increasing recently.⁴⁷
- In 1998/99, 37 per cent of children aged 2-11 were overweight, up from 34 per cent in 1994/95. These included the 18 per cent of children in this age group who were obese in 1998/99, up from 16 per cent in 1994/95.⁴⁸
- A UK study demonstrated that children who walk to school burn more calories than those who are driven. The number of calories burned weekly by walking to school is the equivalent of two hour-long classes of physical education.⁴⁹

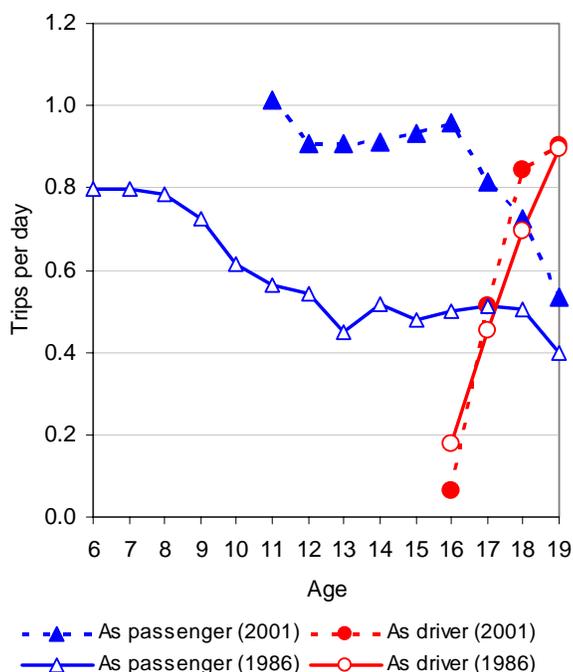
Effects of traffic-related poor air quality, including poor in-vehicle air quality

Road traffic is the main cause of poor air quality in most urban areas of the world and many rural areas, including in Canada. There is considerable evidence that this poor air quality harms children, including the following:

- The World Health Organization found that children may be more vulnerable to airborne pollution because their airways are narrower than those of adults.¹³
- The same work for WHO indicated that there appears to be no threshold for ozone levels that are safe, and children are particularly susceptible.¹⁴
- 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.¹⁷
- Children living in areas of Europe and California with poor air quality have been found to have reduced lung function growth that places them at risk for future respiratory illness.¹⁸

There's other work on this topic:

Travel as car passenger and driver by young people in the Greater Toronto Area, schooldays, 1986 and 2001



- A study of children's exposure to diesel exhaust on school buses in the United States showed that concentrations of fine particulates were often 5-10 times higher than at monitoring stations.²¹
- One author reviewed relevant data and concluded,

Drivers and passengers in cars may inhale up to 18 times as much pollution as people outside their vehicle, the worst occurring in slow-moving driving conditions in urban areas. Levels of benzene were found to be two to 18 times higher than ambient air and levels of carbon monoxide two to 14 times higher. Nitrogen dioxide is also higher (1-2.5 times), especially during high-speed driving on motorways and during afternoon rush hours.²³

Traffic-related fatalities and injuries

The rates of traffic-related injury and fatality are generally lower for children than for adults. Nevertheless, the following should be considered:

- Road traffic crashes are the leading cause of injury death in Canada for children over the age of one year.²⁶
- The risk of harm to a child from traffic is very much higher than the risk of harm from a stranger.²⁷
- A study in the UK found that one third of children who survive traffic crashes may suffer from post-traumatic stress disorder. Symptoms include depression, recurring nightmares, difficulty attending to school work, and fear of cars.²⁸

Keeping Children Safe in Traffic,³¹ a recent report by the Organization for Economic Cooperation and Development, outlines current risks for children in traffic, progress made towards creating safer environments, and the best practices of countries that have made concerted efforts to reduce the risk to children from traffic. Some of the best practices include measures to reduce traffic speed, and public education for children, parents, and drivers.

Effects on emotional and behavioural development

A road traffic crash can have an extreme impact on a child's development, even if the child is not directly injured. There are

more subtle effects from being in an automobile and from the effects of road traffic generally, including the effects of traffic noise. Some relevant findings include the following:

- An Australian study found that heavy traffic reduces the independent mobility of children and youth.³²
- An investigation in the UK found that opportunities and locations for spontaneous, non-structured play can be severely restricted by traffic.³³
- An Austrian study found that low-level but chronic noise of moderate traffic can stress children and raise their blood pressure, heart rate, and levels of stress hormones.³⁴
- There is some evidence from work in Austria that young people who walk to school are emotionally healthier than children who travel by motorized means.³⁷
- A Swiss study found that half of five-year-old children who lived on an "inadequate" street "where traffic is a nuisance and menace to children at play" never played outside, and only 10 per cent played outside for more than two hours a day, mostly in playgrounds.³⁸ All five-year-olds who lived on an "adequate" street played outside, most for more than two hours a day.

"... children who live near high-traffic areas ... may be six times more likely to develop childhood leukemia and other cancers."





HOW MUNICIPAL OFFICIALS CAN CONTRIBUTE

Taken together, the above findings suggest that more attention should be given to transport's impacts on the health of children and youth. Municipal officials can contribute to efforts that reduce the dependence of both adults and children on motorized transport. See *Child- and Youth-Friendly Land-Use and Transport Planning Guidelines* for a detailed discussion and analysis of this issue (at www.cstctd.org).

The approach reflects the following planning principle: *Ensure that in every part of the urban region it is as advantageous to live without a car as with a car.* Neighbourhoods designed this way will have good transit and nearby stores, jobs, and leisure facilities. They will be child- and youth-friendly, and are more likely to be successful neighbourhoods for all people.

To create a local environment that promotes healthy weights, local and regional governments/communities should:

1. Examine community planning policies and processes to identify how local communities can promote physical activity, reduce barriers to physical activity for everyone, and engage young people in physical activity.
2. Provide education and training for community planners, engineers, architects and decision-makers in 'active living by design'.
3. Allow more opportunities for people to be physically active by providing:
 - More park land and recreational areas
 - More safe walking and cycling routes
 - Culturally appropriate and accessible recreation programs
 - Neighbourhoods with shops and schools within walking distance
 - Public transit within walking distance of home, school and work.²

“Are sidewalks and bicycle paths planned with children’s destinations in mind?”

CHECKLIST FOR MUNICIPAL OFFICIALS

- ✓ Do planning departments respond to children's transport needs and trends?
- ✓ Do planning practices consider the potential harmful health impacts on children as well as the benefits?
- ✓ Are sidewalks and bicycle paths planned with children's destinations in mind?
- ✓ Are there sidewalks to all transit stops?
- ✓ Do traffic lights near schools and recreation centres allow enough time for children to cross?
- ✓ Are streets planned to avoid potential sight obstructions for children?
- ✓ What are the opportunities to make recreation facilities more accessible through active transport?
- ✓ Can traffic be reduced by encouraging more live-work opportunities?
- ✓ Are transit fares low for children and youth to encourage use of transit?
- ✓ Are no-idling by-laws enforced, especially near schools?
- ✓ Have you considered reducing permitted traffic speeds in residential areas?
- ✓ Are day care centres situated away from busy roads?
- ✓ What opportunities exist to make transit more child- and youth-friendly?



INITIATIVES AND RESOURCES

Addressing the health issues outlined above requires an integrated and committed effort by many sectors: transport and land-use planners, educators, health professionals, parents, transit authorities, and all levels of government. Solutions range from removing barriers to active transport for all people to creating incentives and opportunities for reducing society's dependence on the automobile. A detailed account of barriers and recommended actions may be found in the Centre's report *Kids on the Move in Halton and Peel*.³

Programs

Active and Safe Routes to School. This is a comprehensive and adaptable program that engages all community partners in finding solutions that meet their needs. Visit <http://www.saferoutestoschool.ca>.

Also visit:

Way to Go! School Program in British Columbia at <http://www.waytogo.icbc.bc.ca>

Go for Green at <http://www.goforgreen.org>

International site for **Walk to School** initiatives at <http://www.iwalktoschool.org>

OffRamp for Youth. A program for high school students that helps youth support sustainable transport choices and create

more opportunities for active transport. It is managed by the Vancouver-based organization Better Environmentally Sound Transportation. Visit the Web site at: <http://www.best.bc.ca>.

Other organizations

The Centre for Sustainable Transportation. More information about the organization responsible for the present booklet is at <http://www.cstctd.org>.

Child Friendly Cities. UNICEF's Child Friendly Cities initiative is at the forefront of efforts to consider children's needs and aspirations in an urban environment. The Secretariat documents and publicizes child-friendly initiatives and supports national and international networks. It addresses the needs of youth up to 18 years of age. (Visit the Web site of UNICEF Innocenti Research Centre at Florence, Italy: <http://www.childfriendlycities.org>)

Books

David Driskell, *Creating better cities with children and youth—A manual for participation*. Earthscan Publications, 2002.

“What are the opportunities to make recreation facilities more accessible through active transport?”

“The present booklet for municipal officials is one of five prepared by The Centre for Sustainable Transportation”

Louise Chawla (ed), *Growing up in an urbanising world*. Earthscan Publications, 2002.

Catherine O’Brien, Richard Gilbert, *Kids on the Move in Halton and Peel*. The Centre for Sustainable Transportation. Available at <http://cstctd.org>.

Other documents

Kids on the Move, European Commission. Available at http://europa.eu.int/comm/environment/youth/air/kids_on_the_move_en.pdf.

This booklet for municipal officials is one of five prepared for The Centre for Sustainable Transportation by Catherine O’Brien, Research Associate, and Richard Gilbert, Research Director. The others are for health and recreation professionals, educators, parents, and youth.

Enquiries about the booklets may be addressed to Catherine O’Brien at cobrien@renc.igs.net. Enquiries about the Centre should be addressed to Al Cormier, President, at transport@cstctd.org.



A walking school bus in Toronto

This project has been financially supported by The Ontario Trillium Foundation. The Foundation is an agency of the Ontario Ministry of Culture. It receives annually \$100 million of government funding generated through Ontario’s charity casino initiative. The Foundation provides grants to eligible charitable and not-for-profit organizations in the arts, culture, sports, recreation, environment and social service sectors.



THE ONTARIO TRILLIUM FOUNDATION
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Page 1: Kirstin Schwass
Pages 3-5: Dan Burden
Page 6: Jacky Kennedy



The Centre for
Sustainable
Transportation

Le Centre pour un
transport durable

CHILDREN, YOUTH, AND TRANSPORT

Contents:

Great reasons to walk and cycle with your child...	1
More great reasons	2
Are your children taking more trips by car?.....	2
Checklist for parents.....	3
Resources	3
More resources	4

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Transportation

For the sources of the facts and figures in this document, see The Centre's *Child- and Youth-Friendly Land-use and Transport Planning Guidelines* at the Web site above.

If we can build a successful city for children we will have a successful city for all people.
Enrique Peñalosa (former mayor of Bogotá, Colombia), The politics of happiness.
Yes! Magazine, Summer 2003,

GREAT REASONS TO WALK AND CYCLE WITH YOUR CHILD

- **Walking and cycling is great exercise.** Less than half of Canadian children and youth are active enough for proper growth and development. Walking and cycling with our children is an ideal way for them to get the vital exercise they need for healthy development.
- **Walking or cycling with a parent teaches traffic safety.** Parents want their children to understand traffic safety and one day walk or cycle independently. Walking and cycling with your child gives the child first-hand experience while still in your secure care. There may also be cycling skills programs offered in your community.
- **Regular exercise may improve your child's academic performance.** There is evidence that students who are physically fit perform better academically.
- **Children love feeling connected with people and the environment around them.**
"I walk to school because I get to see a kitty or a pup and sing along with the birds".
Junior Kindergarten student
- **Walking to and from school five days a week can burn as many calories as two hours of physical education classes.** The rate of obesity in children and youth has increased by 50% in the past 15 years. Daily exercise is an important part of maintaining a healthy body. We are supporting a brighter future when we teach children about active living. Safe Routes to School programs are helping children and parents to choose active transportation to school while dealing with parent concerns about safety.

[More great reasons inside](#) >



“Less than half of Canadian children and youth are active enough for proper growth and development.”

MORE GREAT REASONS TO WALK AND CYCLE WITH YOUR CHILD

- **Keeping our children safe from harm is important to all of us.** Walking or cycling with our children creates more ‘eyes on the street’ and reduces the number of cars on the road which makes everyone safer.
- **Reducing car travel means cleaner air.** Children are more vulnerable to air pollution because they breathe more per unit of body weight. Children who live near high traffic areas are at increased risk for respiratory problems. We can all contribute to cleaner air by driving less.
- **Children benefit from contact with their environment and their community.** Children who walk and cycle in their community learn about the world through their own first-hand experience. This is quite different from viewing it through the window of a moving vehicle. Also, children who live in neighbourhoods that have less traffic tend to have a wider variety of play activities.

Here’s what parents have said about walking with their children ...

“Just to watch them talk, they have a wonderful time!”

“It gives them responsibility. What they really enjoy is that independence.”

- **Reducing children’s dependence on cars for travel contributes to a better future for them.** Vehicle exhausts are polluting our air and contributing to global warming. Reducing our car travel is essential for their health both now and in the future.
- **It’s great exercise for moms and dads!**

“Walking and talking with my dad was the best bit. We saw two slugs with no homes, but they still had their aerials, and someone had dropped their apple from their packed lunch. I wish my dad could walk with me all the time.”

Student walking on International Walk to School Day.



ARE YOUR CHILDREN TAKING MORE TRIPS BY CAR THAN WALKING, CYCLING OR TRANSIT?

- Many parents may recall walking to and from school as a child. Over the past few decades something has changed dramatically in the lives of our children. Fewer and fewer are walking or cycling to school. More are travelling by car.
- The number of car trips made by children on schooldays has almost doubled compared with just 15 years ago, and the number made at weekends is even larger. Some of these car trips have replaced walking, cycling, and transit trips, especially to and from school. Others are completely new trips.
- Adults are travelling only a little more by car, on average, and may not have noticed what has been happening to their children. This booklet is designed to increase your understanding of what has been happening and provide suggestions for improving the situation for children.

CHECKLIST FOR PARENTS AND GUARDIANS

- ✓ Are there sidewalks on at least one side of every road in your community? If not, ask your municipal councillor about making your community more child-friendly.
- ✓ Are you a good role model for your child regarding physical activity?
- ✓ Have you considered using transit, carpooling, car-sharing or teleworking to reduce your car use?
- ✓ If you do use a car, be sure to turn it off to avoid idling for more than 10 seconds.
- ✓ If your child takes a school bus to school, ask your principal whether the bus idles for a long period of time on the school site. Extensive idling exposes students to harmful diesel exhaust.
- ✓ Try keeping a trip diary with your child, paying attention to how and where you usually travel. Discuss how you can reduce your car travel and replace it with more environmentally friendly and healthy trips.
- ✓ Children all over the world are starting to participate more in planning their communities. Their fresh perspectives are helping to create more child-friendly communities. You and your child may want to consider how you can improve your community.
- ✓ If you were to buy a new home, how important would it be for the neighbourhood to be child-friendly, from a transport perspective?

“Are you a good role model for your child regarding physical activity?”



RESOURCES

Safe Routes to School. Green Communities' Active and Safe Routes to School program, designed for schools in Ontario, is a comprehensive and adaptable program that engages community partners in finding solutions. Visit <http://www.saferoutestoschool.ca>. This web site also has information about programs for youth.

Also visit **Way to Go! School Program** in British Columbia at <http://www.waytogo.icbc.bc.ca>.

See the next page for more resources ➤

MORE RESOURCES

Visit *Go for Green* at <http://www.goforgreen.org>.

International site for *Walk to School* initiatives at <http://www.iwalktoschool.org>.

Active School Program. The Ontario Physical Health Education Association promotes an Active School Program to involve schools, parents, and students in programs for more active living. Visit: <http://www.ophea.net/Ophea/Ophea.net/activeschools.cfm>.

The Ontario Healthy Schools Coalition. The OHSC works with schools, parents, students and community agencies to fos-

ter health-promoting social and physical environments. Visit: <http://www.opha.on.ca/ohsc/>.

Safe Kids Canada. This organization provides information about keeping children safe. Its Web site includes safety tips, resources for teachers, and suggestions for advocacy. Visit: <http://www.safekidscanada.ca>.

A Kid's Guide to Building Great Communities: A Manual for Planners and Educators is produced by the Canadian Institute of Planners. Order it at <http://www.cip-icu.ca/English/home.htm>.

The present booklet for parents is one of a series of five prepared by The Centre for Sustainable Transportation.

This booklet was prepared for The Centre for Sustainable Transportation by Catherine O'Brien, Research Associate, and Richard Gilbert, Research Director. Enquiries about the content of the booklet may be addressed to Catherine O'Brien at cobrien@renc.igs.net. Enquiries about the Centre should be addressed to Al Cormier, President, at transport@cstctd.org.



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YOUTH AND TRANSPORT



step out of the vehicle

if you want to change the world



Car-free Day image: www.adbusters.org

More than half of Canadians aged 5 to 17 do not walk or cycle



1. You get the most physical exercise and burn extra calories by:

- (a) driving (or being driven) to school for a week
- (b) one hour Phys. Ed. Class
- (c) walking to school for a week (about 1 km each way)
- (d) playing video games for 8 hours

Answers and explanations below

2. Idling for how long uses more fuel than restarting the car engine?

- (a) 10 seconds
- (b) 30 seconds
- (c) 1 minute
- (d) 3 minutes

3. Which of the following is a form of active transportation?

- (a) skateboarding
- (b) cycling
- (c) walking
- (d) in-line skating
- (e) driving an SUV
- (f) all of the above except (e)
- (g) all of the above

4. The air quality in your car or school bus is likely to be

- (a) better than the air outside
- (b) more polluted than the air outside

1. (c) Walking to school for a week can burn as many calories as 2 hours of Phys. Ed. classes (assuming you don't live next to the school)
2. (a) Idling for more than 10 seconds uses more fuel than turning off the engine and restarting it.
3. (f) The answer could also be (g) if your SUV (Sport Utility Vehicle) is actually a bicycle!
4. (b) There is some evidence that the quality of air inside your car may be 4-10 times worse than the air outside!

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FACTS:

Canadian youth are growing more inactive

- Only 10% of Canadian youth are active enough to receive any heart-health benefits.
- The rate of obesity in children and youth has increased by 50% in the past 15 years.
- An obese preschooler has a $\frac{1}{4}$ chance of becoming an obese adult. An obese teenager has a $\frac{3}{4}$ chance of remaining obese for life!!!!
- Canadian children begin to show a significant decline in physical fitness at 12 years of age. Many drop out of physical or sports activity.

Females are less active than males

- In Canada, only 30% of teenage girls and 40% of teenage boys are considered active enough for optimal growth and development.

Physically fit students perform better academically

- This was a finding of a study of almost a million 5th, 7th, and 9th graders in California. Other things being equal, fitter students did better, especially at math.



The Car-Culture is jeopardizing our future

- 36% of teenage deaths are the result of car crashes.
- In Canada, transportation contributes about 30% of the greenhouse gases that are responsible for global warming.
- Children and youth living in areas with poor air quality have been found to have reduced lung function growth (this places them at risk for future respiratory illness).

In Canada, and many parts of the world, youth are taking action on sustainable transportation.

“I’m most proud of what we’ve done around the school. Before this group was in existence, there was no group active in the school raising awareness about alternative forms of transportation.”

Natasha Kwan: Gr. 12
off ramp leader - Port Moody Secondary

Let’s take a look at a program begun in Vancouver:



What’s off ramp?

Developed by Arthur Orsini for BEST (Better Environmentally Sound Transportation) of Vancouver, BC, off ramp has been working with secondary schools since 1999 to support student leaders in putting together cool strategies to get their peers out of cars.

off ramp recognizes that youth leaders are the best ones to engage their peers. In this youth-led program, teams of 4-7 youth form an off ramp club to host activities to change attitudes and circumstances so that their peers increasingly walk, cycle, ‘board, ‘blade, take transit and carpool.

- ⇒ raise awareness
- ⇒ dismantle barriers
- ⇒ reward ‘good’ behaviour
- ⇒ generate opportunities for more youth to travel car-free

Check out www.best.bc.ca/programsAndServices for a look at some of the hundred-and-one activities;

- #19 walk the labyrinth: an easy to draw chalk labyrinth to draw attention to road safety
- #36 how slow can you go? bike race:
 - rule #1 – keep moving forward
 - rule #2 – no feet on the ground
- #42 build a chopper bike: to create your own artistic velomutation, a rolling sculpture to challenge your balance and surprise your community
- #46 mass bike ride: hold a mass bike ride in order to let a lot of people see you having fun cycling
- #86 strike a pose: improv acting and photography to debunk the car-culture

What else are youth doing?



Youth Summit on Sustainable Urban Transport

“It’s important to me that our society not rely on cars for transportation, because of health, pollution, energy resource depletion, and social reasons.”

Youth Summit participant

Begun in 2002, the Youth Summit on Sustainable Urban Transport takes place every two years bringing 80+ youth aged 17-24 together in Ottawa. See www.cutaactu.ca/en/node/416. Participants first meet with local groups to deepen their understanding of regional transport issues. At the summit, youth leaders connect with activists and professionals already working on sustainable transport issues. They return to their communities better prepared for action.

“I enjoy watching and interacting with people on the bus.” Youth Summit participant

Green Communities Canada and STEP (Sustainable Transportation Education Program)

STEP is a student-led program that promotes environmentally sustainable transportation and physical activity to high school students. Find out more about the program and activities you can do at

www.saferoutestatoschool.ca/index.php?page=step.



what you can do!

- walk, cycle, 'blade, 'board, carpool or use transit for as many trips as possible
- encourage family and friends to reduce car use
- organize off ramp activities in your community
- Host a bike mechanics workshop at school
- Join or start a Cycling Ambassadors group (see www.toronto.ca/cycling/ratsa)
- speak out against idling – let drivers know that idling for more than 10 seconds uses more fuel than turning off the engine and restarting it
- add your voice to youth who are making a difference
- find creative ways to tell other youth the facts about sustainable transportation
- join (or start) a municipal youth advisory committee to let your politicians know what youth need

This booklet has been produced by The Centre for Sustainable Transportation, which has also produced booklets on children, youth and transport for municipal officials, educators, public health professionals, and parents. The Centre has also produced *Child- and Youth-friendly Land-use and Transport Planning Guidelines*, with input from youth and many others interested in these issues. All this work has been financially supported by The Ontario Trillium Foundation. The contribution to the present booklet of Arthur Orsini, Sustainable Transport and Youth's Program Developer, has been especially appreciated.