Shade:
A Planning Guide

York Region

Shade provides effective protection from the sun's ultraviolet radiation, which is known to be the primary cause of skin cancer (Canadian Dermatology Association - Sun Facts). Increasing the public's use of shade can play an important role in skin cancer prevention.

Shade: A Planning Guide is a booklet designed to promote the use of shade for sun protection among individuals and organizations. This planning guide outlines the importance of shade, where shade is essential, how to plan for shade, the different types of shade and how to best utilize and create shaded areas.

The York Region Sunsense Coalition developed *Shade: A Planning Guide* based on the resource entitled Developing Shade in Public Places, with permission from the Anti-Cancer Council of Victoria in Australia.
Cancer Care Ontario - Central East Cancer Prevention and Screening Network provided funding for this project.

Importance of Shade

Taking steps toward practising sun safe behaviour will reduce the risk for developing skin cancer. The provision and use of effective shade is a significant component of a comprehensive approach to the prevention of skin cancer. Seeking shade is an essential element of sun protection along with implementing personal protection strategies such as wearing protective clothing, hats and sunscreen. It is a key strategy to the reduction of exposure to ultraviolet radiation (UVR). Therefore, increasing awareness and access to shade can play an important role in the prevention of skin cancer.

Children and Shade

Children spend a great amount of time outdoors. In fact, 60-80% of lifetime exposure to the sun happens before the age of 18 (Health Canada, 1996). Statistics indicate that 1 in 7 children born today will develop skin cancer in their lifetime (Canadian Cancer Society, 2001). One severe sunburn during childhood doubles the risk of developing skin cancer (Canadian Dermatology Association - Sun Facts). Following proper sun safety practices early in life can greatly lower the risk of developing skin cancer.

What is the best type of Shade?

There is no type of shade that is completely suitable for all situations. However, for shade to be effective, it needs to:

- be comfortable to use, easy to use or access
- protect against indirect ultraviolet radiation. This is UV radiation that is reflected from the ground, other surfaces or by particles in the atmosphere
- provide protection at the right time of the day, at the right time of the year
- be sensitive to the surrounding environment

(NSW Health - Public Health Bulletin, March 2001)

Where shade is essential

Shade is essential at all outdoor spaces where activities take place during times of high ultraviolet radiation. Whether recreational or occupational, many outdoor facilities and venues fit this description. When determining the benefits and most effective use of shade, consider the following areas, groups of people and activities as a priority:

· individuals aged 0-12 years
· outdoor activities that take place in minimal clothing, i.e. at beaches
· outdoor activities that occur between 11 am and 4 pm
· outdoor activities that take place for more than 10 minutes in the summer

(Anti-Cancer Council of Victoria, Developing Shade in Public Places)

Effective shade can be implemented at various facilities and venues, including:

· day care centres
· swimming pools
· sports grounds and facilities
· hotels and motels
· the home
· schools
· beaches
· parks and reserves
· restaurants with outdoor patios
· the workplace

(Under Cover: Guidelines for Shade Planning and Design)

Reflection of UVR

When deciding to create a shaded area, consider that UVR is reflected and scattered by various surfaces and materials, and by particles in the atmosphere. Consider the following points:

- The further away occupants are from the edge of the shade structure, the greater the protection provided from reflected UVR. This is helpful to know when you are deciding on the size of your shade structure.
- Scattered and reflected UVR can be excluded by enclosing the sides of shelters.
- Levels of reflected and scattered UVR at a particular site can be reduced by choosing materials that have low reflection properties for the shade structure and for surrounding surfaces.

To select materials that minimize reflected UVR, take into account:

- surface density - hard surfaces, such as pavement, reflect higher levels of UVR than softer surfaces, such as grass or soil
- surface finish - smooth surfaces, such as metal sheeting and smooth concrete, reflect higher levels of UVR than coarse or varied surfaces, such as timber cladding, roof tiles or brick paving

(Under Cover: Guidelines for Shade Planning and Design)

Planning for Shade

Shade may be provided in the form of natural shade through the use of planted vegetation or by built shade structures that are either portable or permanent. To provide a shade solution specific to a site, consider professional consultation with local nurseries, landscape architects, arborists and/or architects.

The planning stage of a shade project is crucial to the long term success and impact of the project. The degree of planning involved will depend on the scope of the project and the proposed site.

There are several steps in the planning process that should be taken regardless of the scale of the project:

1. Develop an initial concept
2. Form a working party or committee to develop the project
3. Define the shade need
4. Define the project budget
5. Obtain feedback from potential users on the initial concept developed
6. Determine how the shade project will be maintained
7. Develop plans/options for the shade structure
8. Submit plans for building/planting approval
9. Arrange for purchase or contract with a builder/supplier
10. Evaluate effectiveness of structure shade project

(Developing Shade in Public Places, Sunsmart - The Anti-Cancer Council of Victoria)

Natural Shade

Both deciduous trees (trees that lose their leaves every year) and coniferous trees (trees that maintain their leaves throughout the year) provide shade. The effectiveness of natural shade depends upon the density of the foliage (leaves).

Factors to consider when choosing to plant a tree for shade:

- a tall deciduous tree with a wide canopy of dense leaves will give you maximum shade in the summer, while allowing the warming rays of the sun to come through in the winter
- plant deciduous trees to the south and southwest of where you require shade
- site environment (climate, soil)
- size and shape of tree at maturity - avoid trees with invasive roots and those that will grow too large for the area
- planting guidelines - when to plant, where to plant, preparing the site and tree for planting
- tree care requirements - watering, fertilizing, pruning

Selecting Trees for Shade

The following list of trees are those that are well suited to the climate and environment of York Region.

Tree	Height (maximum)	Growth Rate	Worth Noting
Norway Maple (Acer platanoides)	12M	Medium to fast	· dense shade · yellow fall foliage
Red Maple (Acer rubrum)	25 M	Medium to fast	· attractive upright, rounded shape · stunning red fall foliage
Sugar Maple (Acer saccharum)	35 M	Medium	· superb shade tree suited to large yard or open area · brilliant yellow, orange or red fall foliage
Silver Maple (Acer sccharinum)	35 M	Fast	· brilliant yellow, orange or red fall foliage · grows well on moist and wet sites
Horse Chestnut (Aesculus hippocastanum)	25 M	Medium	· white flowers in early summer · suited to large yard or open area
White Ash (Fraxinus americana)	30 M	Medium to fast	· attractive spreading shape · brilliant red-purple fall foliage
Green Ash (Fraxinus pennsylvanica var. subintegerrima)	25 M	Fast	· drought tolerant tree · golden yellow fall foliage
Honey Locust (Gleditsia triancanthos)	30 M	Medium to fast	· provides dappled shade · allows turf to grow underneath
White Oak (Quercus alba)	35 M	Slow to medium	· suited to large yard or open area · red-purple fall foliage
Bur Oak (Quercus macrocarpa)	15 M	Slow to medium	· stately tree with deeply furrowed, gnarled bark · suited to large yard or open area
Red Oak (Quercus rubra)	25 M	Medium	· rounded shape becoming symmetrical with age · dark leaves, turning red in fall
Little Leaf Linden (Tilia cordata)	23 M	Medium	· dark green leaves with silver undersides · small, fragrant flowers in early summer

Farrar, J.L. 1995. Trees in Canada. Natural Resources Canada, Canadian Forest Service, Ottawa, and Fitzhenry and Whiteside, Markham, Ontario

For more tree specific information, consult your local nursery, landscape architect or arborist.

Built Shade Structures

Built shade areas can be permanent or portable. There are a variety of structures that can be used to provide shade. Portable or temporary structures can include umbrellas, awnings and tent-like structures. These structures can usually be bought off the shelf and are usually cost effective. Some of the portable shade structures are small and therefore only provide shade for a small area. Permanent structures such as pavilions or gazebos are generally more expensive, but are usually more sturdy and they provide a permanent shade solution.

A well-constructed shade structure will result in shade that:

- falls in the right places and at the right times of the day throughout the year
- creates an outdoor space that is comfortable to use in all seasons
- minimizes the impact of indirect UVR on the space
- is attractive, practical and environmentally friendly

Other suggestions include:

- choosing materials that will reduce reflectivity (for example, concrete will reflect more than grass)
- ensuring shade structures are an adequate size
- using barriers for side and overhead protection
- extending overhead barriers past actual use area
- optimizing use of existing shade (relocate picnic tables to shade, etc.)
- taking into account water run off from roofed structures to avoid water related problems later

Some safety considerations include:

- making sure all structures conform to current building codes
- ensuring support systems such as posts are visible
- ensuring any guide ropes are not trip hazards
- structures should intrude as little as possible into circulation or play areas
- ensure only non-toxic materials are used, especially for playgrounds and school areas

Other factors to consider when selecting shade materials are:

- maintenance requirements
- waterproofing qualities
- environmental consequences
- wind resistance
- ease of placement
- relative cost
- ultraviolet protection factor of material
- ability to withstand the winter

(Under Cover: Guidelines for Shade Planning and Design)

Built Shade Materials

When choosing materials for built shade structures, it is important to be aware of the ultraviolet protection factor (UPF) of the material. The UPF is a measure of the UVR protection provided by the material. The UPF measures the ability of material to block UVR from passing through and reaching the skin. For example, a UPF of 50 allows only 1/50 or 2% of the UV radiation to pass through and make contact with skin. Sun protection devices should have a UPF of 15-50+. It is important to note that as fabrics age and fade, the UPF will decrease. When purchasing shade products, find out the minimum UPF of the material, as many manufacturers will claim a material provides "up to" a certain UPF level.

UPF 15-24 Good	**UPF 25-39 Very Good**	**UPF 40-50+ Excellent**

Although many materials block the sun's UVR, not all of them block enough to be classified as sun protection. Two factors that can affect the UPF of fabric are weave and colour of the material. Fabrics that have a tighter weave will block more UVR. Also, darker colours absorb more UVR and therefore provide better sun protection.

(Under Cover: Guidelines for Shade Planning and Design)

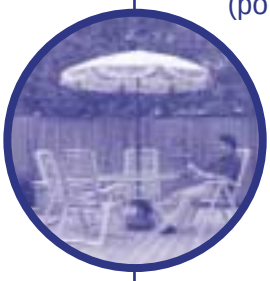
Factors to Consider with Built Shade Materials

	Glass	Polycarbonate & fibreglass sheeting	Canvas or other tightly woven cloths	Knitted polythene or woven PVC shadecloth	Timber
Suitability	Good windbreak where visibility and light is required	Roofing, walling, louvre, awnings, skylights, canopies	Good for small, low budget jobs	Canopies, awnings and tents	Pergolas, trellis, screens
UVR Protection	Depends on thickness. Ordinary window glass is not highly protective. UVA penetrates glass.	Very high	Very high when new	Shade cloth rating of 90% gives only medium UVR protection. Double knits may give higher protection.	Direct barrier to UVR
Waterproof	Yes	Yes	Yes, watertight up to a certain point	Porous - lacks rain protection	Depends on detailing and use
Light transmission	High, depending on tint	High. Differs according to thickness, profile and colour.	Light colours allow more light	Lighter colours allow more light to reflect and scatter more UVR	Depends on detailing
Solar heat gain	Less heat gain if tinted	High	Dark colours are warmer	Darker colours are warmer but reflect less UVR	Does conduct heat
Lifespan	Long, if it doesn't sustain impact	About 10 years. Discolouration may occur sooner.	Limited. Susceptible to breakdown due to UVR exposure.	5-10 years	Long life if well maintained
Maintenance requirements	Needs regular cleaning	Low maintenance. Impact resistant.	Is not mould resistant	Susceptible to mould growth and dirt pickup	Guard against termites. Maintenance painting needed

(Developing Shade in Public Places, Sunsmart - The Anti-Cancer Council of Victoria)

Comparing Types of Shade

Type of Shade	Examples	Benefits	Drawbacks	Where to obtain shade structures
Natural (vegetation)	Trees, shrubs, vines	· Can be very effective, depending on the density of the foliage · Can offer seasonal variations in scent and colour · Aesthetically pleasing · Environmentally friendly	· If newly planted, may take years to reach maturity and provide adequate shade · Requires maintenance, especially for new trees · Some plants may be poisonous or attract bees /insects	Local nurseries and tree farms
Built (portable)	Umbrellas, awnings, tent-like structures	· Price: can be found at very reasonable prices · Ideal for some locations such as the beach · Can be adapted for use in a variety of situations · Readily available	· Provides a temporary shade solution · Usually suitable for only one or a few people · Requires maintenance	Local businesses such as hardware stores and home stores Shade manufacturers
Built (permanent)	Awnings, pavilions, gazebos, built structures	· Provide a permanent shade solution · Can provide shade to a large number of people	· Price: can be expensive · Requires more extensive planning to implement · Requires maintenance	Local businesses such as hardware stores and home stores Shade manufacturers



Permits and Approvals

It is important to remember that if you plan to build a permanent structure or plant a tree, check with the appropriate authorities first to ensure that your activities will comply with applicable local by-laws.

In general, privately owned facilities, such as workplaces and day cares, should consult their local municipality for guidance and to obtain the necessary permits, if required. Schools must get approval from their School Board prior to building any structures or planting trees on school property.

Sunsense Guidelines

In addition to seeking and providing shade, it is important to take personal sun protection measures.

Practise sun safety behaviours by:

- reducing sun exposure between 11 am and 4 pm.
  Plan outdoor activities when the sun's rays are less intense.
- choosing clothes that will protect arms and legs, a wide brimmed hat and sunglasses with UVA and UVB protection.
- using a sunscreen and lip balm with SPF 15 or higher.

(Adapted from Canadian Cancer Society Sunsense Guidelines)

How to Plan a Sun Safe Event

As the organizer of an outdoor event, you can help protect your participants, staff and volunteers from the sun's harmful rays by providing adequate shade.

Plan for shade by:

- Observing the sun patterns at the same time of day your event will be held. Note where shade falls and take advantage of this existing shade by placing registration tables and drinks in shaded areas.
- If your site has little natural shade from trees and buildings, plan to provide additional temporary shade structures such as umbrellas, awnings or tents.
- If you are setting up an area for drink breaks or a lunch, ensure that it is in the shade.
- Any special presentations, prize draws or speeches should occur in an area that allows participants to stand in the shade.
- Ensure that staff and volunteers are able to rotate tasks between shaded or indoor areas and outdoor exposed activities. Avoid having the same people exposed to the direct rays of the sun all day.

For optimal **sun safety** at your outdoor event, encourage your participants, staff and volunteers to take personal sun protection measures.

(Sun Smart: Anti-Cancer Council of Victoria)

Funding Opportunities

The following funding opportunities were found by searching the Evergreen Data Base, which can be found at http://www.evergreen.ca/en/resources/funding.html. Most of the grants are for environmental projects. If your school or organization is able to link your shade project with naturalization of the local environment and possibly the school curriculum, many of these funding grants would be applicable.

1. **Canada Trust - Friends of the Environment Foundation**
   An excellent source of funding. Contact your local Canada Trust Branch and ask for your Friends of the Environment Foundation representative.
   http://www.fef.ca

2. **Enbridge Pipelines Inc. - Community Based Environmental Initiative Program**
   This program provides funding to grassroots community groups along the pipeline area between Edmonton and Montreal to help them implement environmental projects.
   http://www.enbridge.com/piplines/enviro_plan.html

3. **Environment Canada - Eco-Action Ontario Region**
   Helps groups to implement projects that protect or enhance the environment in their community.
   http://www.on.ec.gc.ca/ecoaction

4. **Shell Canada - Shell Environmental Fund**
   Shell supports small community groups in local environmental projects. Funding is provided to action oriented projects that improve the environment.
   http://www.shell.ca

5. **The Chawkers Foundation**
   This organization funds environmental and educational projects.
   Tel: 613-741-1440

6. **The Tree Canada Foundation - Greening Canada's School Grounds**
   The Tree Canada Foundation and Shell Canada Limited have partnered to bring schools the "Greening Canada's School Grounds" program. This program provides schools with the information and financial resources to successfully plan and implement a "greening school ground" project.
   http://treecanada.ca

7. **Toyota Evergreen Learning Grounds**
   Toyota and Evergreen provide funding grants to assist schools across Canada with the creation and expansion of naturalized areas for learning and discovery on their grounds.
   www.evergreen.ca/en/lg/lg-funding.html

8. **Trillium Foundation**
   The Trillium Foundation supports efforts to protect, restore and promote the benefits of a clean, healthy environment. Applications must be submitted by registered charitable organizations.
   http://www.trilliumfoundation.org

For more information

Canadian Cancer Society
www.cancer.ca
Contact your local office or call 1-888-939-3333

Canadian Dermatology Association
www.dermatology.ca

Evergreen Foundation
(Greening school grounds)
www.evergreen.ca
Toronto calling area: 416-596-1495
Toll free: 1-888-426-3138

Environment Canada
"UV Index and Sun Protection"
www.msc-smc.ec.gc.ca/uvindex
Toll free: 1-800-668-6767

National Gardening Association
(gardening web site for children and schools)
www.kidsgardening.com

Tree Canada - "Greening School Grounds"
www.greengrounds.org

Developing Shade in Public Places
Sunsmart - The Anti-Cancer Council of Victoria
www.sunsmart.com.au

Under Cover - Guidelines for Shade Planning and Design
Greenwood, J.S., Soulos, G.P., Thomas, N.D.
New South Wales Cancer Council and
New South Wales Health Department
Sydney, Australia
www.sunsmart.com.au

York Region Health Services Department
Health Connection 1-800-361-5653
www.region.york.on.ca

For more information
on shade and sun safety, call
York Region Health Services Department,
Health Connection at
1-800-361-5653

York Region Sunsense Coalition Membership:

Canadian Cancer Society

Town of Newmarket Public Works and Environmental Services

Toronto Sunnybrook Regional Cancer Centre

Ontario Early Years Centre - Richmond Hill

York Region Health Services

York Region