

# Shade Guidelines Summary

Full version available at [www.toronto.ca/health/resources/tcpc/shade\\_guidelines.htm](http://www.toronto.ca/health/resources/tcpc/shade_guidelines.htm)

## The Shade Policy for the City of Toronto states:

The provision of shade can be an effective means of reducing exposure to ultraviolet radiation (UVR) and its associated health risks such as skin cancer. Furthermore, the presence of shade can encourage physical activity, reduce greenhouse gas and air pollutant emissions, mitigate the urban heat island effect and reduce energy costs.

The provision of shade, either natural or constructed, should be an essential element when planning for and developing new City facilities such as parks or public spaces, and in refurbishing existing City-owned and operated facilities and sites. Increasing shade in Toronto contributes to a healthier and more sustainable city.

The *Shade Guidelines* are intended to assist with the implementation of the Shade Policy. They contain recommendations for increasing shade at outdoor facilities owned and operated by the City of Toronto.

Many of these facilities are used mainly during the summer between 11:00 am to 4:00 pm EDT.<sup>1</sup> This is when direct ultraviolet radiation (UVR) levels are at their highest, when high levels of indirect UVR reflect from surfaces and when users, especially children, typically spend more time outdoors and wear minimal clothing.

UVR in Canada has historically been strong enough to cause skin damage and Southern Ontario has the strongest UVR especially during the following months:

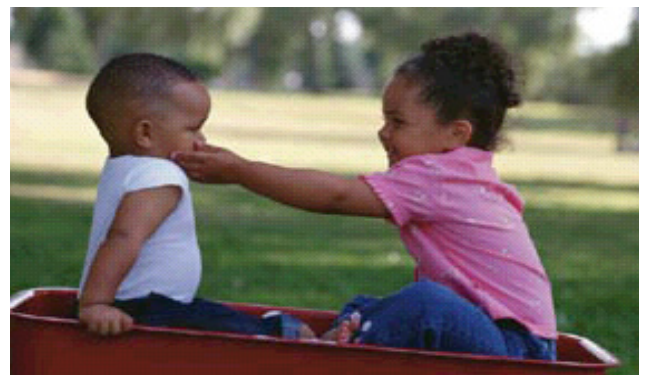
APRIL	MAY	JUNE/JULY	AUGUST	SEPTEMBER
Moderate-High	High	Very High	High	Moderate-High

## About Skin Cancer

- The International Agency for Research on Cancer (IARC) has determined that solar radiation and more particularly, the ultraviolet portion of solar radiation, is a human carcinogen for skin cancer
- Skin cancer is the most common cancer diagnosed in Canadians, yet, it is largely preventable
- The total estimated economic burden of skin cancer in Canada for 2004 was \$532 million annually; projected to rise to \$922 million by 2031<sup>2</sup>
- Sunburn is the skin's visible reaction to acute UVR overexposure and increases the risk of skin cancer
- Chronic exposure to UVR is recognized as a major cause of skin cancer
- Having fair skin, many moles, freckles, red hair and the tendency to burn easily are among the characteristics that predispose some people to a higher risk of developing skin cancer

## Children Require Special Protection

- Overexposure to UVR during the early years is a major determinant of lifetime risk of skin cancer
- Children aged 6 to 12 spend the most time in the sun of any age group and 25% are not protected<sup>3</sup>
- Over 50% of children also get their worst sunburn while watching or participating in outdoor activities<sup>4</sup>



<sup>1</sup> Eastern Daylight Time

<sup>2</sup> Krueger, Williams, Chomiak, & Trenaman, 2010.

<sup>3,4</sup> The Ontario Sun Safety Working Group. Sun Exposure and Protective Behaviours in Ontario: An Ontario Report Based on the 2006 Second National Sun Survey. Toronto: Canadian Cancer Society, Ontario Division, 2010.



# Shade Guidelines Summary

## Sites where shade is important:

- Waterplay and Swimming Pools
- Playgrounds
- Beaches
- Streetscapes
- Special Activity Areas in Parks
- Pathways and Trails
- Childcare Centres
- Paved Activity and Play Areas
- Public Squares
- Sportsfields
- Parking Lots



The *Shade Guidelines* provide detailed information for each of the above sites. Some sites, such as waterplay and swimming pools, clearly have a greater need for shade, because they have the highest exposure to intense UVR levels and users are in bathing suits. Municipalities must be able to establish priorities for increasing shade in these venues.



## Who are the *Shade Guidelines* for and how can they be used?

Who is this document for?	How can it be used?
<b>Strategic and Policy Planners</b>	<ul style="list-style-type: none"> <li>• Incorporate shade into strategic vision and departmental policy</li> <li>• Understand and confirm Public Health responsibilities</li> <li>• Incorporate in the Official Plan, Secondary Plans of the City of Toronto</li> </ul>
<b>City Planners</b>	<ul style="list-style-type: none"> <li>• Ensure shade is addressed within specific planning initiatives (i.e. Avenue and Area Studies) and within specific development applications</li> </ul>
<b>Parks Planners</b>	<ul style="list-style-type: none"> <li>• Ensure that shade is addressed in park Master Plans and studies for parkland and facilities</li> </ul>
<b>Landscape Architects</b>	<ul style="list-style-type: none"> <li>• Incorporate into park designs and specific projects (i.e. playgrounds, waterplays) done in-house by staff or consultants</li> </ul>
<b>Architects</b>	<ul style="list-style-type: none"> <li>• Incorporate into the design of outdoor areas or building edges that are part of building and facility designs</li> </ul>
<b>Urban Designers</b>	<ul style="list-style-type: none"> <li>• Address shade within the public realm (i.e. streetscapes, public squares) in studies and specific projects</li> </ul>
<b>Managers and Operators of Parks, Open Spaces and Facilities</b>	<ul style="list-style-type: none"> <li>• Understand municipal responsibilities for providing safe public environments to meet the needs of users</li> <li>• Incorporate into operational plans for parks and facilities</li> </ul>
<b>Programmers and Event Planners</b>	<ul style="list-style-type: none"> <li>• Incorporate into event planning, programming of public spaces and issuing permits for use</li> <li>• Promote shade and Sun Safety in public communications and promotion of events</li> </ul>
<b>Public Health Planners</b>	<ul style="list-style-type: none"> <li>• Promote shade and UVR protection within communities</li> <li>• Advocate for Sun Safety and UVR protection to other municipal departments as part of an overall program of meeting Public Health objectives</li> </ul>
<b>Urban Forestry Planners</b>	<ul style="list-style-type: none"> <li>• Incorporate into annual planting objectives; meeting tree canopy targets</li> <li>• Understand specific location of plantings and species to create useful shade</li> </ul>
<b>Partnership Development Officers</b>	<ul style="list-style-type: none"> <li>• Include shade projects in partnerships with foundations, businesses, not-for-profit organizations, community groups, residents' associations and individuals</li> </ul>
<b>Product Suppliers</b>	<ul style="list-style-type: none"> <li>• Understand Public Health objectives and opportunities to develop and supply structures and portable shade devices</li> </ul>
<b>Community Groups</b>	<ul style="list-style-type: none"> <li>• Understand Public Health objectives as part of advocacy for shade and UVR protection</li> <li>• Promote shade in specific community projects</li> </ul>



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## Types of Shade

**Natural, Constructed and Portable Shade are all part of shade solutions**

### Natural Shade

One of the principal means of providing natural shade in public places is through the planting and nurturing of trees. Trees can be planted and with appropriate care can provide significant and long-term benefits to the health of a community. Other natural shade options include vegetation such as shrubs and vines.

During the summer months, people usually associate trees with shade and cooling when seeking relief from intense sunlight. It makes sense to place a high priority on the strategic use of trees in the design of outdoor spaces. Trees with dense, wide canopies and low foliage create the most shade and protect people from overexposure to UVR and the risk of skin cancer.



### Tree Canopy Density Guide

The Canopy Density Guide will help you to assess the level of UVR protection provided by different trees.

View the tree canopy against the sky and compare with illustrated leaf/canopy patterns. Estimate which pattern of sky and leaves most closely approximates to the observed canopy.



#### Heavy – Over 90% UVR Protection

Good protection from direct UVR. Protection from indirect UVR will depend on canopy size and where a person is positioned under the canopy. Suitable for long-stay use if personal sun protection measures are also used.



#### Medium – Around 60% UVR Protection

Filtered shade provides low levels of protection from direct and indirect UVR. Suitable for short-stay use only. Personal sun protection measures should also be used.



#### Light – Less than 30% UVR Protection

Poor protection from direct and indirect UVR. Suitable for transit shade only.

(Greenwood, Soulos, & Thomas, Under cover: Guidelines for shade planning and design NSW Cancer Council and NSW Health Department Sydney, 2003).



## Selecting Shade Trees\*

### Rationale for Shade Tree Selection

#### Growth characteristics to consider for suitable shade trees

- ✓ Fast growing, “how long can I wait for shade?” (perhaps you can wait)
- ✓ Large trees (more shade and more available use area below)
- ✓ Trees with a large crown to stem ratio (broader canopy)
- ✓ Trees that are long lasting (these tend to be slower growing as well)
- ✓ Trees with higher leaf /canopy density (more effective UVR protection)

#### Growth characteristics to avoid for shade trees

- ✗ Trees prone to limb failure (i.e., Manitoba maple)
- ✗ Small trees, ornamentals, large shrubs (less shade and less use area)
- ✗ Short-lived or temperamental trees



### Deciding Factor . . . Suitable Site Conditions

#### The key to successful natural shade

- Amount of sun and wind exposure
- Soil type
- Moisture level

#### Plus

- Available growing space – will it be enough for the species to mature?
- Proximity to use/shade target area – will it provide adequate shade?
- Search for species that match your site conditions – then select for your preferred tree characteristics.



### Species to Consider for Shade

- |                |                 |
|----------------|-----------------|
| Accolade Elm   | Black Maple     |
| Freeman Maple  | Hackberry       |
| Honey Locust   | Kentucky Coffee |
| London Plane   | Red Maple       |
| Redmond Linden | Red Oak         |
| Silver Maple   | Sugar Maple     |
| Sycamore       | Tulip           |
| White Oak      |                 |

#### All Trees do not Create Equal Shade

Species such as fruit trees and ornamentals are beautiful but are not the best choices for shade

- Small ornamentals, i.e., Japanese maple
- Fruit trees (often small)
- Cedars (very narrow)
- Smaller slow growing understory trees (redbud, blue beech, ironwood)

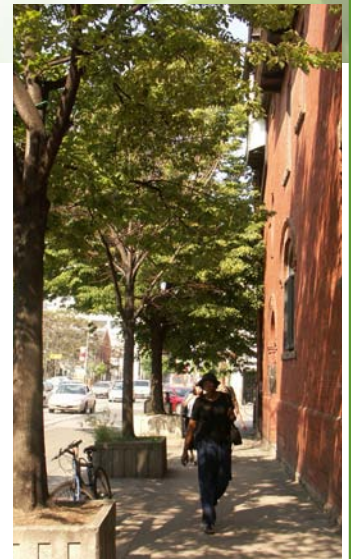
Make sure to check the nursery tag for mature growth, height and width.



### Resources for Tree Selection

Tree species, with information on preferred conditions and attributes, are available in two locations for your reference:

- *Shade Guidelines* page 137
- **Urban Forestry Online**  
[http://www.toronto.ca/trees/pdfs/Tree\\_List.pdf](http://www.toronto.ca/trees/pdfs/Tree_List.pdf)



\*This page on Selecting Shade Trees was developed by the City of Toronto Urban Forestry for the Shade Guidelines

## Constructed Shade

A well designed and built shade structure is one that will provide shade where and when it's needed, creates an outdoor space comfortable for all-season use, is attractive, practical, safe and environmentally friendly, and minimizes the impact of direct and indirect UVR on people in the space.

Constructed shade can be permanent or portable. Materials that reduce reflectivity should be appropriate to the location and expected uses, and be engineered to meet building code standards.

Often constructed shade can serve multiple purposes, offering protection in inclement weather, collecting rainwater or supporting alternative energy sources, such as solar panels.

### Permanent shade can have the following attributes:

- **Durable** – designed and built to last for a significant length of time
- **Demountable** – designed for seasonal / occasional use and
- **Adjustable** – flexible, adjustable and responsive to local climate conditions

Structural systems providing shade could be rigid or flexible and assembled using a combination of straight or curved line elements to create coverage and support. Structures can be free-standing or connected to adjacent structures.

Combining trees and constructed shade is often advisable. In some cases, structures can be installed until newly-planted shade trees mature. The design of a constructed shade element should also consider questions of context, use, operation, sun orientation, durability, safety, budget and aesthetics.



## Portable Shade

### Portable shade can provide UVR protection on a temporary basis:

- For personal use, such as at a beach or in a park
- To provide shade over a long duration for workers or a small number of participants at special events

While portable shade devices can provide a quick solution for individuals or small groups, generally they are less effective for larger groups and do not provide effective protection for indirect UVR.



## Co-benefits of Shade

### Did you know shade has numerous health and environmental benefits?

Shade protects humans from overexposure to solar UVR and the increased risk of skin cancer, some types of eye melanoma, cataracts and premature skin aging and wrinkling.

### Shade-providing trees or structures

- reduce the urban heat island effect by cooling pavements and parking lots
- improve energy efficiency by reducing the cost of air conditioning during the summer
- provide a cool, comfortable environment that fosters participation in physical activity

### Shade-providing trees and other vegetation

- reduce air pollution and improve air quality by slowing smog formation
- reduce the amount of carbon dioxide in the atmosphere
- enable children to play in outdoor environments, which promotes their physical, social and emotional health and well-being



## Culture of Sun Safety

### Guiding Principles for UVR Protection and Shade Provision

1. Promote Sun Safety and personal protection measures.
2. Provide Sun Safe environments.
3. Encourage proposals for shade to creatively draw from a variety of solutions.
4. Ensure Shade solutions are adequate for expected levels of use.
5. Establish the Critical Protection Time (CPT) between 11:00 a.m. to 4:00 p.m. Eastern Daylight Time (EDT) as a priority period for UVR protection during the summer months.
6. Limit exposure in the sun to 10-15 minutes during the CPT.
7. Identify sites and activities where children and adolescents are involved and assign a higher priority to them for UVR protection and shade provision.

### Personal Protection Measures

1. Limit the time in the sun between 11 a.m. - 4 p.m. or whenever the UV Index is 3 or more.
2. Look for shaded areas to do outdoor activities.
3. Wear a hat with a wide brim or a visor and back flap.
4. Wear clothing to protect as much skin as possible.
5. Wear UVA and UVB protective sunglasses.
6. Use a sunscreen with SPF 15 or higher that gives protection from both UVA and UVB rays.

### Environment Canada's UV Index

The UV Index is a measure of how intense the UVR is at any time.

0 – 2	LOW	Minimal sun protection
3 – 5	MODERATE	Take precautions
6 – 7	HIGH	Protection required
8 – 10	VERY HIGH	Extra precautions required
11 +	EXTREME	Take full precautions

[www.toronto.ca/health/cancerprevention/pdf/uv\\_index.pdf](http://www.toronto.ca/health/cancerprevention/pdf/uv_index.pdf)



Source: Toronto Public Health  
[www.toronto.ca/health/cancerprevention/sunsafety.htm](http://www.toronto.ca/health/cancerprevention/sunsafety.htm)



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## Planning for Shade

### The Shade Audit

#### Background

The Shade Audit is an effective evaluative tool available to those planning for shade provision at sites and facilities and for subsequently developing design solutions. It outlines a comprehensive process based on the four major steps outlined below, that will allow managers of sites as well as designers to understand where there are sun exposure risks and what steps can be taken to minimize those risks.

The Shade Audit was developed in Australia by Architect John Greenwood who along with G.P. Soulos and N.D. Thomas developed the document *Undercover: Guidelines for Shade Planning and Design* in 1998 and revised in 2003. He subsequently developed the *WebShade* software that has refined the Shade Audit process into an interactive computer-based tool.

#### A. Understanding Site Users and Activities

1. What are the main activities on the site?  
Who are the users of the site, both individuals and groups?
2. When do activities occur?  
What time of year or time of day is the site used?
3. What is the duration of each type of activity?
4. What are the ages of the users?
5. How well used is the site?
6. Are there activities on the site which are discretionary vs. non-discretionary?
7. What is the likelihood of risk behaviour?

#### B. Conducting an Inventory of Site Conditions and Existing Shade

1. How does the site accommodate existing uses? Where on the site do the main activities and site uses occur?
2. Identify the existing shade (quantity and quality) provided on the site by trees.
3. Determine the effect that future tree growth will have on the amount of shade provided at the site.
4. Where is the existing shade (quantity and quality) provided on the site by buildings and structures?
5. Does the nature of the site or facility place constraints on shade provision?
6. Do site users and activities on the site take advantage of available shade?
7. What are the potential effects of indirect UVR at the site?
8. Would a structure be useful for other things besides shade protection?

#### C. Identifying Potential Risks

1. How adequate is the existing shade at the site, particularly during summer?
2. Is the amount of shade adequate for the number of people using the site?
3. Is adequate shade provided for each type of user?
4. In areas of non-discretionary use, is adequate shade and UVR protection available?
5. Are there areas where indirect UVR is a problem and needs to be mitigated?

#### D. Making Recommendations

1. Establish an overall shade provision and UVR reduction goal for the site or facility.
2. Consider whether there are options to relocate the activity or facility to better access available shade.
3. Change the time of the event relative to the Critical Protection Time (CPT). 11 a.m. to 4:00 p.m. EDT.
4. Develop a strategy for the addition of natural, constructed or portable shade to reduce the risk.
5. As part of the overall strategy, develop plans for natural shade.
6. As part of the overall strategy, develop plans for constructed shade.
7. Specify portable shade if appropriate to the site and activity.
8. Develop a strategy to deal with indirect UVR.
9. Incorporate planning principles and design standards that complement shade planning.



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## The Policy Framework

The following are some adopted policies and strategies in the City of Toronto that support the importance of shade

### The Official Plan

[www.toronto.ca/planning/official\\_plan/introduction.htm](http://www.toronto.ca/planning/official_plan/introduction.htm)

### City of Toronto Sun Protection Policy for Outdoor Workers

Internal website

### Policy for Shade Provision at Parks, Forestry and Recreation Sites

[www.toronto.ca/health/resources/tcpc/pdf/shade\\_p10\\_guidelines.pdf](http://www.toronto.ca/health/resources/tcpc/pdf/shade_p10_guidelines.pdf)

### Climate Change, Clean Air and Sustainable Energy Action Plan

[www.toronto.ca/changeisintheair/index.htm](http://www.toronto.ca/changeisintheair/index.htm)

### Toronto Green Standard

[www.toronto.ca/planning/environment/greendevlopment.htm](http://www.toronto.ca/planning/environment/greendevlopment.htm)

### Increasing Tree Canopy

[www.toronto.ca/trees/urban\\_forest\\_now\\_forever.htm](http://www.toronto.ca/trees/urban_forest_now_forever.htm)

### Protecting and Planting the Urban Forest

[www.toronto.ca/trees/](http://www.toronto.ca/trees/)

### Design Guidelines for Greening Parking Lots

[www.toronto.ca/planning/urbdesign/greening\\_parking\\_lots.htm](http://www.toronto.ca/planning/urbdesign/greening_parking_lots.htm)

### Streetscape Manual

[www.toronto.ca/planning/urbdesign/streetscapemanual.htm](http://www.toronto.ca/planning/urbdesign/streetscapemanual.htm)

### Policy for Children's Services

[www.toronto.ca/children/](http://www.toronto.ca/children/)

### Toronto Green Roof Bylaw

[www.toronto.ca/greenroofs/](http://www.toronto.ca/greenroofs/)



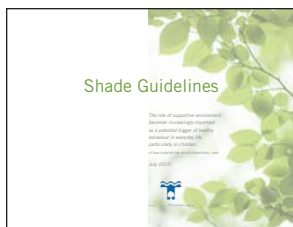
## Acknowledgements

The *Shade Guidelines* have been created by the Shade Policy Committee of the Toronto Cancer Prevention Coalition Ultraviolet Radiation Working Group in collaboration with Parks, Forestry and Recreation and with the support of Toronto Public Health, as directed by the Board of Health and City Council.

The Shade Policy Committee is a reflection of the remarkable partnership and vigilance of a multidisciplinary group who have provided significant knowledge and expertise to this initiative and given generously of their time since 2002.

## An Evolving Document

The *Shade Guidelines* include a user feedback form to facilitate future improvements to this document.



*The role of supportive environment becomes increasingly important as a potential trigger of healthy behaviour in everyday life, particularly in children.*

OTTAWA CHARTER FOR HEALTH PROMOTION, 1986.

July 2010

If you have any comments or questions please email [shade@toronto.ca](mailto:shade@toronto.ca)



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