





## 5.1 PRINCIPLES OF INTERSECTION DESIGN

The design of intersections is a balancing act between the safety and convenience of users of different modes with the desire to provide a high quality public realm. Intersections present the highest concentration of conflict points along a roadway. The design of intersections must address the potential for conflict through appropriate context-sensitive design choices.

As noted in York Region's Designing Great Streets guidelines, "intersections are shared spaces, and should be designed to ensure that users are aware of one another and move predictably in order to reduce the number and severity of collisions."



The following principles underlie the intersection concepts presented in these guidelines:



### MAXIMIZE VISIBILITY

Vulnerable road users are smaller, travel more slowly and react differently than those in motorized vehicles. As a result, intersection design should seek to enhance the visibility between users to allow sufficient perception & reaction time to avoid each other at conflict points. Several different approaches can be used to maximize visibility, depending on the context. For example, simplifying the surrounding environment to such an extent that the vulnerable user becomes the focus, or applying enhanced pavement markings & signage to highlight the travel paths of cyclists & pedestrians.



### MINIMIZE EXPOSURE

Depending on the geometry of the intersection and the type of intersection treatments, pedestrians may experience different levels of exposure to conflicts with motor vehicles, and each other. Wherever possible, conflicts should be eliminated or consolidated through modifications to intersection geometry, pavement markings, signage or signals. This should be coupled with on-going work at the Region to separate cyclists and pedestrians from conflicts in time (through signal phasing) and in space (i.e. grade separation) as applicable. Increased exposure can be a major deterrent to walking and cycling where users perceive that intersections create major risks.



### PROMOTE CONSISTENCY

One of the key objectives of these guidelines is to standardize treatments and to provide guidance as “one size does not fit all” across the Region. This will help to make interactions between users of different modes more predictable and less stressful. Designs are intended to be intuitive and easy to use. It should be noted that promoting consistency does not mean applying the identical treatment at every intersection – rather, it is about creating clear expectation through similar treatments and clear design choices that reflect the land use and roadway context, while creating a high quality public realm experience.



### ACHIEVE DESIRED TURNING SPEEDS

Lower motor vehicle operating speeds can reduce the likelihood and severity of collisions, and can increase pedestrian and cyclist comfort. This increased comfort can, in turn, help to attract new cyclists and pedestrians. Speeds through intersections can be lowered through careful selection of geometric elements such as corner radii and turn lane width, or by adding physical traffic calming measures such as raised crosswalks. While the Region has clear objectives to support efficient motor vehicle travel, particularly for goods movements and employment purposes, intersections with current or future high pedestrian & cycling volumes are primary locations for focusing efforts to reduce speeds. A balanced approach based on the needs of the corridor should be used when developing project-specific design criteria.

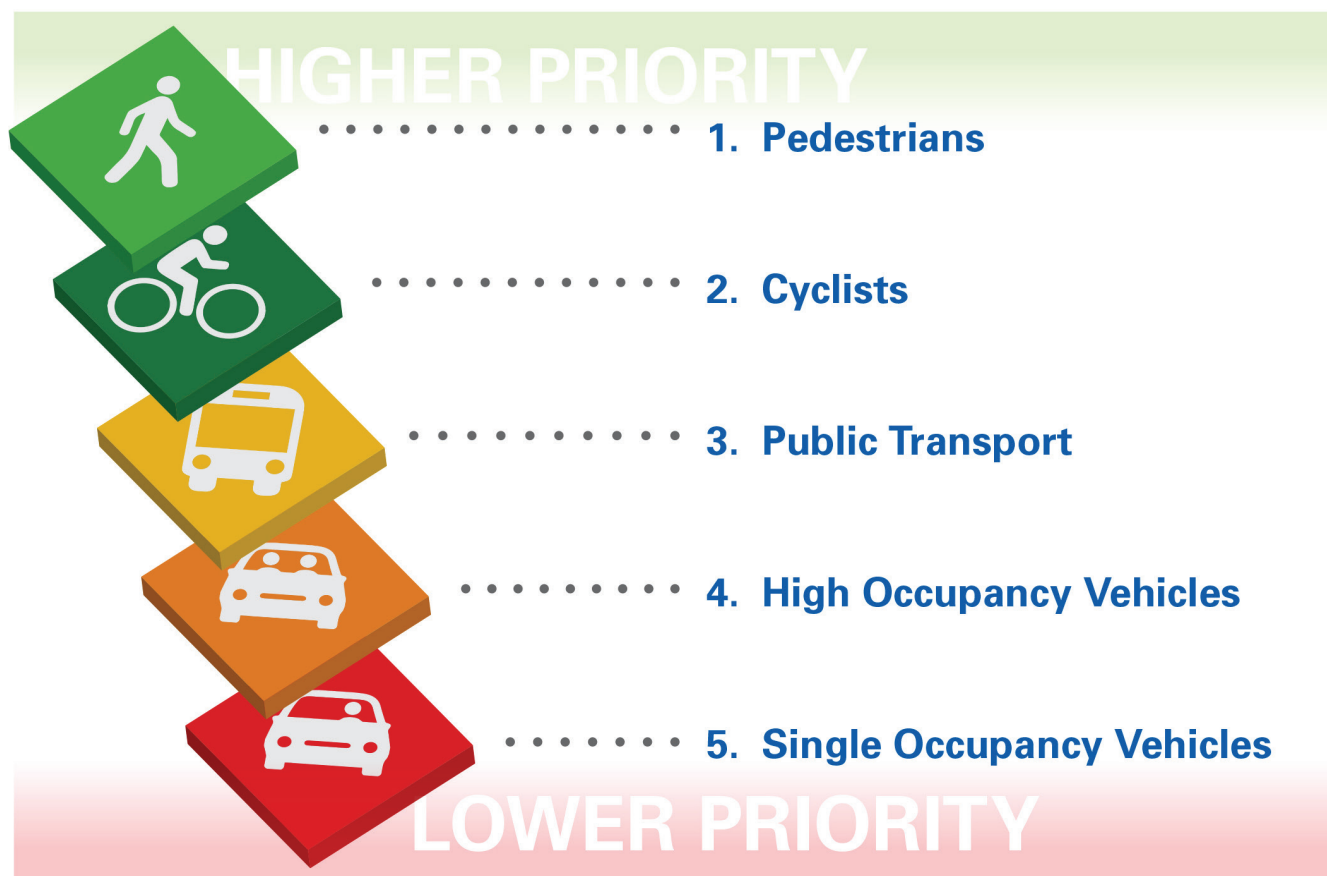
In addition to these safety-focused principles, it is important to also recognize the need to provide a **high quality public realm**, which is attractive and comfortable for pedestrians and cyclists alike.



The hierarchy for improved pedestrian and cycling treatments through intersections is clearly articulated in the Regional context-sensitive design guidelines, Designing Great Streets (refer to Exhibit 5-1).

This hierarchy drives the development of these guidelines.

Exhibit 5-1. Hierarchy for users at Intersections



### 5.1.1 Overview

Similarly to the guidance on cross-sections, the intersection treatments presented in these guidelines incorporate minimum and preferred elements in an attempt to prioritize design choices, reflect budgetary limitations, and provide flexibility for designers.

Note that all signage and pavement markings identified in the following sections are referenced in more detail in Chapter 7 – Pavement Markings & Signage, including standard dimensions of pavement markings from various Ontario Traffic Manuals.