

APPENDIX B

SOLUTIONS

BICYCLE ROUTE PLANNING

Signs along identified City of Burlington roadways, such as Harvester Road, should communicate various types of information to the bikeway user. Recommended signage has been organized according to the following four functions; Bikeway Designation Signs, Wayfinding Signs, Regulatory Signs and Warning Signs.

- Bikeway Designation signs should be used to “brand” or identify routes that constitute the spine network. This type of sign may be designed in various sizes depending on its intended application. Designation signs may be mounted alone or with other signs at logical, highly visible locations on both on and off-road network route segments.
- Way-Finding signs may include the network logo or “brand” and communicate other information to network users such as directional arrows and distances in kilometres to major attractions and settlement areas. Way-finding signs should be mounted on standard sign poles and located on all legs of an intersection or off-road trail junction, as well as at gateways.
- Regulatory signs are intended to control particular aspects of travel and use along the road or off-road bicycle route as illustrated in **Figure A-1**. Signage restricting or requiring specific behaviour is not legally enforceable unless it is associated with a provincial law or municipal by-law. Where applicable, it is recommended that authorities discreetly include the municipal by-law number on signs to reinforce their regulatory function.
- Warning signs are used to highlight cycling conditions that may pose a potential safety or convenience concern to cyclists. Examples are steep slopes, share the road, railway crossings and pavement changes, as illustrated in Figure A-1. These signs are diamond in shape, with a black legend on a yellow background.



Figure A-1 – Example of Regulatory

Sign: Reserved Bicycle Lane Sign Rb-84

SIGNING STRATEGY

A signing strategy can serve as a useful tool in projecting a clear message to motorists and cyclists, while providing bike facilities for widespread use. A mapping tool may be adopted to assist City staff and the Public in illustrating the location where each sign should be placed, as well as the proper sign type.

A digital plan showing all signs and their locations may serve useful to City staff to assist them in the placement of bikeway signs. Signed bicycle routes should typically have a Route Identifier sign placed every 200 metres, or approximately 5 signs per kilometre. Bicycle route identifier signs are typically used on roads with low AADT's and in residential areas.

In areas where traffic volumes or speed limits are perceived to be higher than normal for a residential collector, on busy arterial roads, or where there may be sharp turns along a segment, Share-the-Road signs should be used in conjunction with standard bicycle route identifier signs. For example, every 3rd sign placed along a 1 kilometre segment of a bikeway may be a Share-the-Road sign with the remainder being standard bicycle route identifier signs. The use of Share-the-Road signs is dependent on the geometric conditions of a bicycle route and may be used at the discretion of the City.

MONITORING & MAINTENANCE PROGRAM

Monitoring bicycle trends, particularly ridership and collision history, will be an important part of measuring the success of the planning policies and designs guidelines recommended for the City of Burlington. The review of historic data undertaken for this study clearly indicates the need for improvements in the collection of cycling data in the City. In addition, regular public attitude surveys are needed to monitor cycling concerns associated with the cycling facilities provided.

Monitoring the different aspects of cycling behaviour will assist in evaluating the effectiveness and overall contribution of various activities to achieve the stated vision and goals. A bicycle data collection program will serve to establish initial benchmarks and then provide on-going data to identify trends and monitor increases in cycling trips along particular transportation links within the City. In order to collect consistent and reliable bicycle traffic data for analyzing these trends, the City must develop a new bicycle data collection program which will:

- use existing cycling travel demand information as a benchmark for assessing growth in cycling trips;
- measure the progress towards achieving the City's goals and objectives; and
- identify cycling issues and trends to establish priorities.

The maintenance costs and liabilities involved in the installation of a public bikeway system are major concerns to municipalities. Effective bikeway design can decrease maintenance costs and minimize liability risks.

The maintenance of on-road bikeways in the City of Burlington should be generally based upon the maintenance standards established by the City's Engineering Department. When possible, especially in the Spring, Summer and Fall months, priority consideration should be given to debris removal of City Roads with bikeway facilities.

In winter months, roads designated with on-road bikeways that are part of the City's bikeways network should receive priority for snow clearing and removal. This means that paved shoulders or bike lanes on these roads should be cleared of snow to accommodate cyclists.

Perhaps one of the most difficult tasks in maintenance is collecting the litter that accumulates. This applies not only to off-road trails but to on-road facilities as well. While the collection of litter is a municipal responsibility, recently it has become common practice to encourage citizens' groups to assist in litter control. Similar to the "Adopt-A-Trail" and "Adopt-A-Road" initiatives, promoting an "Adopt-A-Bikeway" program will assist the City with dealing with this issue.

Leaf removal can also become problematic, depending on budget constraints and on roadways with many deciduous trees. Leaves can present a serious obstacle to cyclists when encountered in roadway gutters and when stopping. Leaves can also hide pot holes, debris and drainage inlets. It is recommended that any significant accumulation of fallen leaves be removed from the travelled portion of bikeways and roadways as soon as possible to prevent accidents. This may also be another function of the "Adopt-A-Bikeway" program.

The risks of liability associated with the above issues is significantly reduced if the City provides adequate resources and a co-ordinated program of good bikeway design, construction, monitoring, maintenance and repairs.

Monitoring the maintenance of bikeway facilities is an important responsibility which can be managed efficiently and cost-effectively. The most critical period of any maintenance program is during the Spring. Once the snow has melted and the temperatures begin the increase, the number of both utilitarian and recreational cyclists trends increase substantially. During this time, the areas that require improvements become more evident such as the replacement of pavement markings and undertaking pothole repairs. Digital photographs, GPS equipment and spreadsheet programs available to most municipalities are useful tools in documenting and prioritizing bikeway facilities. To minimize costs, the on-going management of this program is well with the capability of summer or co-op students employed by the City each year.

IMPLEMENTATION STRATEGY

The success of the recommendations offered in this report will be measured in part by the ease with which this can be implemented. Ease of implementation can be measured by two criteria:

- A practical strategy that identifies and sets out a recommended approach to implement the Plan, and also addresses priorities and phasing;
- Monitoring of bikeways to assess the implementation results and to serve as feedback to refine on-going implementation.

Bikeways require infrastructure, program development and operations funding to ensure their successful implementation.

Some of the bikeways in the City of Burlington require little if any improvement beyond a change in pavement markings and/or signage. These types of improvements as well as the ongoing maintenance of the network should be included in the City's Public Works capital budget as well as its short and long-term budget forecasts. **Appendix C** outlines the estimated costs associated with implementing the signage and pavement marking recommendations made in this report. This unit cost estimate has been calculated using 2003 dollars.

Operations costs include on-going funding related to implementing the Plan, preparing progress reports, delivering safety, education and promotional programs, and performing network and infrastructure maintenance. This also includes staff, as well as management and administration resources.

A report that identifies priorities for the upcoming budget year should be submitted either annually or bi-annually to review the programs' progress. This report should outline the types of infrastructure and programs costs associated with the implementation of the monitoring and maintenance program, and confirm associated budget requirements