

CITY OF KINGSTON - CYCLING AND PATHWAYS STUDY

November 2003

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Executive Summary

Background and Purpose

In October 2002, the City of Kingston adopted a *Community Strategic Plan*. The *Community Strategic Plan* was the result of an extensive community consultation process. The *Plan* identified 12 initiatives to be acted upon during the life of the strategy. One of these initiatives was the Official Plan initiative.

The Official Plan initiative includes a Waterfront Strategy to develop a single updated and integrated approach to the waterfront and a *Transportation Master Plan* to provide a balanced and sustainable transportation system.

Furthermore, there was increasing public demand for more recreational pathways and greater waterfront access. As a result, it was recognized that there was the need for a comprehensive review of the cycling and pathway systems for the entire new City of Kingston.

The purpose of the *Kingston Cycling and Pathways Study* is to provide the City and its' citizens with ideas and direction. This work has been based on thorough investigation of local opportunities and challenges. It has benefited from ongoing input from community user / interest groups and the general public, who have attended a number of meetings and open houses. The *Study* draws from the experience of other municipalities and, represents the state of the art in planning for pedestrians and cyclists. It also explores a number of misconceptions associated with these modes of transportation.

The *Kingston Cycling and Pathways Study* presents a vision of what could be. It recommends the programs and facilities that would provide pedestrians and cyclists with an obtainable level of reasonable service. The *Study* is not intended as an exercise in advocacy or to assess feasibility. The *Study* requires that the City, through its' staff, user / interest groups and citizens, rally and develop strategies to make the ideas presented a reality.

The City of Kingston is approximately 453 square kilometres in area with the urban/ suburban area comprising 12 percent of the City's land base and 78 percent of the City's 2001 population of 114,195 persons. The City of Kingston is projected to have a population of nearly 147,000 persons (medium projection) by the year 2026.

There is over 150 kilometres of shoreline in the City, fronting on Lake Ontario, the St. Lawrence River, the Great Cataraqui River and the Little Cataraqui Creek. Currently, the City of Kingston waterfront pathway system extends approximately 19 kilometres.

The City has an abundance of parks, open space areas, recreational uses, historical and environmental sites and attractions, many of which could be linked with an improved pathway system. The City currently controls, through ownership / lease / right-of-way a significant amount of public open space, of which waterfront property is a major component. There are two nationally renowned attractions, the Rideau Canal and Fort Henry.

The City of Kingston offers a variety of existing transportation components that give a wide range of choice to residents and visitors. The key transportation components include the following:

- Approximately 803 kilometres of roadways in a variety of roadway classifications;
- An existing waterfront pathway system in the former City of Kingston along part of the Lake Ontario waterfront and the Great Cataraqui River;
- An urban pathway system comprised of sidewalks, subdivision walkways and linear parklands;
- Limited on-road cycling facilities;
- A section of the Rideau Trail;
- Linkage to four regional highways including Highways Number 2, 15, 33 and 38 of which many locations have paved shoulders of various widths;
- A municipal airport, a regional bus terminal and a rail passenger station with regular VIA train service; and
- A municipal urban transit system consisting of standard buses.

There are four important studies / strategies which will impact this *Kingston Cycling and Pathways Study*. The *Transportation Master Plan*, a two-year project, expected to be complete in 2003, proposes integrated multi-modal improvements to the municipal transportation system. The *Urban Growth Strategy* provides direction as to the areas of potential growth from the perspective of planning, servicing and financial considerations. The *Downtown Action Plan* examines above ground infrastructure and landscaping in the downtown. It is to be completed in 2003.

The fourth strategy, a waterfront strategy, was identified in the *Community Strategic Plan* and selected by City Council as a priority item for completion. The City has completed a waterfront visioning exercise and is currently preparing a work plan to undertake a waterfront strategy. City Council, through its waterfront visioning exercises in November and December 2001, established some broad principles for the waterfront.

The Waterfront Regeneration Trust, a not for profit charitable organization, has been working to facilitate the regeneration of the Lake Ontario waterfront. Central in this regeneration is the long-term goal of implementing the Lake Ontario Waterfront Trail, a multi-use pathway/greenway extending from Niagara-on-the-Lake to Trenton and beyond.

Locally, the Waterfront Working Group is working to extend the trail eastward from Napanee and the Glenora Ferry to connect to Kingston, Gananoque and Brockville.

The *Kingston Cycling and Pathways Study* has been commissioned and executed at an opportune time. Some of the reasons for this are as follows:

- As a result of extensive public consultation, there is a pro-walking and cycling objective in the *Kingston Transportation Master Plan*.
- The public shows an interest in high-profile multi-use pathways, cycling in general and increased access to Kingston's waterfront lands.

- There is increasing interest in extending the Lake Ontario Waterfront Trail easterly to and through Kingston. This facility is currently being established between Niagara-on-the-Lake and Trenton. It has received significant funding from federal, provincial and municipal governments.

Kingston is well positioned to make itself a Canadian leader in encouraging travel by pedestrians and cyclists. The City benefits from access to Lake Ontario and the Great Cataraqui River waterfront. It has a compact and vibrant downtown and University that are the cultural and commercial heart of the region. Kingston has four significant groups that are interested in pedestrian and cycling travel, those being Queen's University students, visiting tourists, active seniors and urban professionals. Despite winters that can provide long periods of snow cover, it is possible to walk or cycle the majority of the year. Kingston is relatively flat and benefits from good air quality, compared to other cities, that supports physical exercise.

Methodology

The methodology for the Study included the following:

- A review of previous studies, reports, mapping, correspondence and meeting minutes relevant to the Study.
- A digital (AutoCAD) base plan was developed from information supplied by the City. Regional context, urban area and downtown waterfront focussed maps were produced.
- The Study prepared an inventory of existing linear facilities proposed by the City and others. This information was confirmed by the consultants in the field, and then shown on the Study Facility Network Master Plans. These plans were displayed at public open houses and at meetings with user / interest groups, where additions and connections were made. The Kingston Cultural Services, Engineering and Planning Divisions also reviewed these plans.
- Lists of destinations relevant to pedestrians and cyclists were compiled. Recreational, utilitarian, student and tourist interests were anticipated.
- Facility Network Master Plans were developed initially on field checks of facilities proposed by others, but also on map study and investigation by the consultants across the City. The road network, open space systems and anticipated desire lines for users for possible crossings of private property were all investigated for potential facilities. The connection of destinations and the continuity of facilities was the desired objective.

- Public Consultation was addressed in a number of ways:
 - The general public was invited to three facilitated open houses. Comments were received, recorded and incorporated appropriately.
 - Meetings with specific interest groups were also held to review material and obtain input.
 - The City maintained information on the Study on the City's website. A downloaded comment sheet was available.
- The consultants used and reviewed technical manuals and resource information provided by the City. They relied on experience gained from previous studies that had been prepared for other municipalities and information beyond what the City had provided.
- The consultants carried out meetings with the Study Steering Committee and the key municipal divisions - Planning, Engineering and Cultural Services.
- An initial draft Study report and a final Study report were produced and circulated for comments from City staff, the Cataraqui Region Conservation Authority (CRCA) and the general public through the City website.
- A presentation was made to the City of Kingston Planning Committee and City Council.

Summary of Recommendations

The following is a summary of recommendations made by the Study consultants based on their findings, experience and expertise.

1. City Policy

The City should adopt policies that support pedestrian and cycling travel with clearly defined positions on specific issues, including:

- Priority should be given to persons with physical disabilities. Physically disabled individuals should be given first consideration; pedestrians over cyclists; cyclists over public transit operations and motorists; and public transit operations over motorists. The assumption that motorists have first priority in the public transportation system should be challenged.
- Wherever possible modes of travel should compliment each other. Multi-modal trips should be encouraged. Bicycle racks on transit vehicles are an example of this. The City has proposed a trial program of bicycle racks on City buses in spring 2004, to be dubbed "Rack and Roll".
- The City should actively promote pedestrian and cycling travel as progressive, socially responsible and enjoyable. Highlight the benefits of alternatives to automobile

dependency. They include, but are not limited to, environmental, health and fitness, convenience and financial benefits.

- The City should lead by example. Adopt programs to encourage walking and cycling by City employees.

2. Existing Facilities

The City should make the primary infrastructure (sidewalks, pathways and roadways), conducive to comfortable and efficient travel by pedestrians and cyclists. The following objectives are recommended:

- In “urban areas” (as used in this study), public rights-of-way should have at least one continuous, hard surfaced linear facility for the use of pedestrians. (i.e. a concrete sidewalk on at least one side of the public roadway.) An example of where sidewalks are missing as of 2003 is Third Avenue, between Victoria Street and Macdonnell Street.
- Where continuous, paved facilities are not feasible along both sides of a roadway, approved standard crossing facilities should be installed to provide access to the continuous facility on the single side. In some cases, a sidewalk exists on one side of the roadway, however, because of site-specific conditions a sidewalk on both sides may be required. An example of where sidewalks are missing as of 2003 is King Street West, east of the Kingston Penitentiary to Beverley Street.
- Sidewalks should not be placed directly adjacent to the roadway where the posted speed limit of the roadway is greater than 50 km per hour. A separation distance (i.e. a boulevard) or barrier is recommended between the roadway and the sidewalk where possible.
- The typical operating space of on-road cyclists is the outside or curb lanes of municipal roadways. They should be efficient and comfortable for through-travel by cyclists. The surface of the roadway, the gutter area and utility covers (i.e. manholes and catch-basins) should be sound and bicycle-compatible. The surface of bridges (i.e. metal grating on the La Salle Causeway in 2003) and railway track crossings should be reviewed and made bicycle-compatible. The Causeway is owned by Public Works Canada.
- Special attention should be given to anticipating the operating movements of cyclists through multi-lane and signalized intersections. All multi-lane signalized intersections should have adequate lane space for waiting and turning cyclists. Cyclist’s needs for road space should not be compromised.
- Attention should be given to how the typical operating space required by cyclists in outside or curb lanes is affected by right turn lanes, highway on / off ramps and major driveways. A continuous operating space is required.

- Before existing paved shoulders / maintenance widenings can be designated (i.e. with signs and/or on maps) as cycling facilities, they should be evaluated and upgraded to standard conditions of service. The continuity of paved shoulders and maintenance widenings should be reviewed at specific problem areas and amended appropriately.
- All intersection signals actuated by under-road sensors should be adjusted to respond to bicycles. As priority conversions, signalized intersections located on roadways identified on the Urban Area - Utilitarian Cycling Focus and Recreational Focus Master Plans should be upgraded first. A series of three round dots should be added to the roadway asphalt to indicate the optimum signal activating location for cyclists.
- The City should remove existing signs that are not consistent with new policies once adopted. Examples are the following:
 - numerous old Waterfront Walkway / Pathway signs
 - green signs of the existing but discontinuous Kingston cycling route
 - cycling-prohibited sign on Gardiners Road northbound, north of Bath Road

3. Future Facilities and Master Plans

The City should adopt the following four Facility Network Master Plans, developed through this *Kingston Cycling and Pathways Study*, as schedules in the new Official Plan:

- Regional Context - Existing Facilities & Master Plan
- Urban Area - Pedestrian Focus Master Plan
- Urban Area - Recreational Focus Master Plan
- Urban Area - Utilitarian Cycling Focus Master Plan

These plans should be maintained digitally by the City for future reference and would guide the planning and development of citywide future facilities intended specifically for pedestrians and/or cyclists.

- Once adopted, the City should dedicate funds to begin the phased implementation of the facilities, programs and policies recommended by this *Kingston Cycling and Pathways Study*.
- The City should attempt to systematically acquire or negotiate public access agreements on properties with important waterfront and pathway connectivity potential.
- With regard to the future of Highway 401, the following facility crossings are recommended:
 - Westbrook Road bridge over Highway 401. No roadway changes anticipated.

- K & P abandoned railway. MTO to install a reduced sized culvert – from the existing 8.6 m height to a proposed 5.0 m height corrugated steel pipe culvert.
- Between the K & P abandoned railway and the Little Cataraqui Creek Conservation Area. Rebuild the existing culvert to accommodate both the Little Cataraqui Creek and a 3.3 metre wide asphalt multi-use pathway or develop a new independent tunnel for a 3.3 metre wide asphalt multi-use pathway.
- Division Street / Perth Road Underpass (Widen the roadway curb lanes to 4.25 metres or install 1.5 metre cycling lanes. Install sidewalks on at least one side of the roadway, preferably on the west side of the roadway between Dalton Avenue and the bottom of the hill to the north).
- Montreal Street / Battersea Road (Widen roadway to incorporate minimum 1.2 metre wide paved shoulders continuous through the interchange).
- CN Railway underpass (Install chain link fencing and grading of ground adjacent to the existing overhead telephone line, east of the tracks).
- Montreal Street / Highway 15 (Widen roadway to incorporate min. 1.2 metre wide paved shoulders continuous through the interchange).
- Joyceville Road (Widen roadway to incorporate minimum 1.2 metre wide paved shoulders continuous through the interchange).

4. Facility Standards and Guidelines

The Study recommends that the City should adopt standards and guidelines for the development of new facilities and the redevelopment of existing facilities for pedestrians and cyclists that are based on established principles and newly adopted City policies. Standards and guidelines should be applied consistently. For a complete list of guidelines see Section 4.4, Design, Signage and Maintenance Guidelines which recommend that:

- The City should be cautious not to promote the use of facilities (i.e. with designation signage or with promotional programs) that do not meet minimum performance standards.
- Standards for on-road cycling facilities should generally be consistent with the Ontario Ministry of Transportation *Bikeways Planning and Design Guidelines*, March 1996 and the Transportation Association of Canada *Bikeway Traffic Control Guidelines for Canada*, December 1998. Additional relevant guidelines are included in this *Cycling and Pathways Study*. Where there is a discrepancy between guidelines, it is recommended that the information in this Study take precedent.
- Standards for off-road facilities for pedestrians, cyclists and other pathway users should generally be consistent with the Waterfront Regeneration Trust *Design, Signage and Maintenance Guidelines*, April 1997. Additional applicable guidelines are included in this *Kingston Cycling and Pathways Study*.

- All new urban multi-use pathways or existing pathways that are to be rebuilt should be a minimum of 2.7 metres wide in consideration of pedestrians, cyclists and in-line skaters. The general preferred width should be 3.0 metres.
- All new urban arterials and urban collectors that are to be rebuilt should be reconfigured to have, at a minimum, wide curb lanes (i.e. minimum 4.25 m wide) in consideration of cyclists. As priority conversions, cycling routes located on roadways identified on the Urban Area - Utilitarian Cycling Focus and Recreational Focus Master Plans should be upgraded first and others as opportunities arise.
- The recommended minimum width of a public right-of-way corridor intended to include a multi-use pathway is 10 metres. This minimum width allows for the potential inclusion of a 3.0 metre wide pathway, horizontal clearance distances, landscaping (i.e. shade trees), seating areas and property line fencing. Where it is necessary to make a vital off-road connection between existing and/or potential facilities, an absolute minimum corridor width of 5.0 metres would be acceptable.
- All new rural cross section roadways and rural cross section roadways that are to be rebuilt should have paved shoulders (i.e. minimum 1.2 m wide) in consideration of cyclists. As priority conversions, cycling routes located on roadways identified on the Urban Area - Utilitarian Cycling Focus and Recreational Focus Master Plans should be upgraded first.
- In future traffic calming exercises, the City should exempt cyclists from signed turn restrictions. For example, left turn restrictions should be exempted for cyclists because a cyclist waiting to turn left does not cause lane congestion. Cyclists should be “filtered” through traffic diverters and speed humps so as not to adversely affect their access and momentum.
- The maintenance level of outside or curb lanes on all arterial and collector roadways identified on the Urban Area - Utilitarian Cycling Focus and Recreational Focus Master Plans should be increased to equal that currently on roads. This should include pothole and crack repairs, utility covers repairs and adjustments, street sweeping, snow clearing and general troubleshooting.
- The City should avoid the future development of boulevard pathways, except as part of a recreational focused facility where short lengths of this type of off-road pathway can bridge the gap between otherwise discontinuous linear facilities. Boulevard pathways that simply parallel arterial roads where other opportunities may be available should not be developed. See Appendix One - *Glossary of Terms* for a definition of boulevard pathways. Appendix One is also included in *Volume 2 – Technical Appendices*.
- Where major multi-use pathways or other high profile pedestrian facilities cross high-traffic-volume, high speed and / or multi-lane arterial roads mid-block it is recommended that only demand-activated signalized crossings be installed. Signals should be visual and audible traffic signals. This system allows pathway or sidewalk users by use of a push button, to activate a red traffic control signal light to stop vehicular traffic in order

that pedestrians can cross. Textural pavement changes should occur to indicate facilities for the visually challenged.

- Where major multi-use pathways or other high-profile pedestrian facilities cross lower-traffic-volume, lower-speed and / or two-lane collector and local roadways it is recommended that crossing facilities acceptable to the City be installed.
- The City should expand the program of providing secure bicycle parking facilities. The City should continue to install facilities such as the successful “post and ring” lock-up or other facilities that support the bicycle frame and allows at least one wheel and the bicycle frame to be locked. These facilities should eventually be provided citywide at appropriate locations along city streets, at public transit transfer stations and at major workplace, parkland, education, tourism and shopping destinations. It is further recommended that the City should lead by example and install bicycle-parking facilities at municipal offices and city-owned buildings.
- Design high-quality designation signage for all future multi-use and pedestrian-only pathways. Only post designation signs where the facilities meet acceptable standards.
- The City endorses the principles of environmental protection. It recognizes that a sensitively planned and implemented off-road pathway system is consistent with those objectives. The City should initiate a comprehensive pathway management program to ensure there is adequate monitoring, signage and public education that has regard for environmental protection.
- The City should consider lowering the posted maximum speed on local residential streets and significant sections of roadway (i.e. in the vicinity of schools and cycling priority roadways) to 40 kilometres per hour.
- The City should consider moving on-road parking on on-way streets consistently to the left side of the roadway in consideration of cyclists who conventionally travel on the right side of the roadway.

5. City By-Laws

Overall, the City should amend by-laws that regulate off-road travel by pedestrians and cyclists. Many of the existing by-laws are dated in their terminology, overly complicated and in a practical sense difficult to enforce. Specific recommendations include the following:

- By-law 38-10 (former City of Kingston) should be rewritten to exempt children under 10 years of age from being prohibited from riding on sidewalks.
- By-laws regulating pedestrian and cycling travel along the Lake Ontario waterfront and specific neighbourhoods should be consistent with the by-laws regulating other City off-road facilities and other City by-laws. By-law 59-3045 and 64-4729 excluding cyclists from certain “walkway” rights-of-way should be repealed.

- By-law 94-100 (former City of Kingston) should be replaced. The current Waterfront Walkway / Pathway should be redefined. It is recommended that a restricted use facility be identified as the section of the future Kingston Waterfront Trail located immediately adjacent to Lake Ontario between Barrie Street, Anglin Bay and the Fort Henry Drive / Duty Drive/ Highway 2 intersection, and it should be reserved as a pedestrian-only precinct due to potential user conflicts with cyclists and in line skaters. Riding cyclists and in-line skating should be prohibited. Riding cyclists and in-line skaters should be facilitated elsewhere.
- By-laws 9, 229 and 96-119 (former City of Kingston) concerning licensing of bicycles should be repealed. Current compliance is low. Enforcement and administration likely cost the City more than the collected fees generate in public revenue.
- The City of Toronto has the following by-law in place with regard to cycling lanes:

“A motorist may ONLY enter a bicycle lane in order to enter or exit a private lane or driveway; to drop off and pick up disabled persons as defined in the *Highway Traffic Act*; or to make a right turn at a road intersecting a bicycle lane.”

A similar by-law for Kingston and strict ongoing enforcement is recommended.

6. Planning Issues

- The City should assign an individual staff member to manage cycling and pedestrian issues, programs and development. This position would be an important liaison between various City divisions, user / interest groups and the general public.
- The City should work in close co-operation with the other local groups and authorities that are planning and implementing cycling and pathway facilities and programs. This would include the Cataraqui Region Conservation Authority, adjacent municipalities, the Waterfront Regeneration Trust and other levels of government (i.e. Ministry of Transportation Ontario, Corrections Canada, Department of National Defence, Parks Canada, etc.).
- New development and redevelopment should be evaluated through site plan approval in terms of its accommodation of pedestrians and cyclists (i.e. direct accessibility, sidewalks, bicycle parking, snow clearing, personal security, etc).
- The City should not accept linear parkland dedications from developers adjacent to roadway rights-of-way if the intention is to develop boulevard pathways within them. Boulevard pathways are typically two-way multi-use pathways located on one side of a roadway in the boulevard with the purpose of duplicating or replacing the on-road cycling use of the roadway. They should not be developed or encouraged unless there is no other alternative. Multi-use pathway development should be associated with linear open space systems based on off-road (i.e. through sub-division) and/or natural systems

(i.e. valley lands). Cyclists should either be cycling on the roads with vehicle traffic or well separated from the roads on multi-use pathways. Boulevard pathways raise safety concerns particularly in ways cyclists interface with intersections often surprising motorists and potentially causing accidents.

7. Support Programs

- The City should seek out and establish partnerships with organizations in the community that would share in the provision of support programs. Those potential partners would include the CRCA, local businesses, the KFL & A Health Unit and advocacy, sports and environmental groups, etc.
- Provide *Can-Bike* training courses to the public of all ages. The City's Cultural Services Division could administer these courses, which could be a municipal program run at community centres. *Can-Bike* has programs specifically created for school-age children. These could be made available through the Boards of Education.
- Continue to support the community walking groups program, *Walk On*.
- A similar approach to *Walk On* could be introduced for cyclists. Existing Bicycle User Groups (BUGs) have been created at Queen's University, MTO and OHIP. New support groups should be encouraged or introduced at other schools, businesses and institutions.
- Continue the annual "Kingston Bike Week" or "Walk to Work" promotion day(s) or week.
- Reintroduce the "Kingston Share the Road" motorist / cyclist awareness campaign.
- When establishing new types of facilities (i.e. road crossings, or multi-modal roadways), the City should proceed with an extensive public education campaign addressing the background and operations of the new facilities. This could include the distribution of pamphlets, radio announcements and advertisements in newspapers, along with information signs located at strategic points of entry to the City.
- Encourage a police enforcement campaign for responsible cycling, pedestrian and motor vehicle use. For cyclists, target infractions including failing to stop where legally required, riding on sidewalks and not having appropriate lights at night. For pedestrians, target jaywalking and proper use of crosswalks. For motorists, target opening doors into cyclists, failing to signal turns and illegal parking and standing.
- Establish Citizen Advisory Committees that would provide the City with on-going input on pedestrian and cycling travel issues made up of citizens, city staff and representatives of the CRCA.
- Target students, seniors and other groups for pedestrian and cycling awareness and education programs, through student media, social and orientation events.

- A balance should be found between building pedestrian and cycling facilities and supporting education programs, so that these facilities are used in the best manner possible, by cyclists, pedestrians and motorists alike. Funding that is spent on expensive facilities may be unavailable for education programs. It is a good idea to consider the cost effectiveness of facility development balanced with potential education, encouragement and enforcement programs that may prove to be desirable or preferable.

8. Methods of Managing Risk and Liability

The following methods of reducing risk should be initiated to help Kingston minimize the liability associated with providing designated facilities.

- **Reduce accidents**

Improving the physical environment, increasing public awareness of the rights and obligations of cyclists and pedestrians and improving access to educational programs are all positive steps that will reduce the likelihood of accidents occurring and lawsuits being initiated by injured parties. Although these improvements may also promote increased use of pathways and road facilities, increased use operating in improved conditions must be viewed as a preferable situation to the do nothing alternative.

- **The selection, design and designation of facilities should conform to the highest prevailing standards.**

The City has shown due care by initiating this in-depth *Kingston Cycling and Pathways Study* and by employing experts in the specific field of multi-use pathways and cycling transportation. In terms of the design of future City facilities and programs, it is recommended that designers have knowledge of current appropriate design standards and trends.

This *Kingston Cycling and Pathways Study* has incorporated standards from the Ministry of Transportation (MTO), Waterfront Regeneration Trust *Trail Design, Signage and Maintenance Guidelines*, Canadian Institute of Planners (CIP) *Community Cycling Manual*, the American Association of State Highway and Transportation Officials (AASHTO) *Guide for the Development of Bicycle Facilities*, and the *Bikeway Guidelines* as well as guidelines from other North American transportation planning agencies and those responsible for multi-use pathways.

Regulatory signs, as identified by the MTO *Manual of Uniform Traffic Control Devices*, should be used to indicate the applicability of legal requirements that might not otherwise be apparent.

- **Facility design should comply with all applicable laws and regulations.**

Proposed on-road facilities should be designed in complete compliance with the Ontario *Highway Traffic Act* and current municipal legislation. Off-road pathways should be designed to meet current and accepted standards.

- **Maintenance operations should conform to acceptable standards.**
Remove all cycling hazards from public roadways. Remove all pedestrian and cyclist hazards from pathways. If a hazard cannot be removed, it must be isolated with barriers or notified by clear warning signage.
- **Monitor, on a regular basis, the physical conditions and operations of roadways and pathway facilities.**
Regular inspections should be made to identify design oversights, deteriorations and new developments that present themselves as hazards. The individuals making these inspections should be trained in assessing hazards that are specific to the use of cyclists and pedestrians in urban conditions and on multi-use pathways. All reports of hazardous conditions received from cyclists, pedestrians, police or others should be promptly and thoroughly investigated.

It is noted that the insurance company for the Cataraqui Region Conservation Authority (CRCA) encourages the CRCA to make at least one property inspection, preferably two, on an annual basis. This is in response to “due diligence” procedures and the responsibility for public safety. On the Cataraqui Trail, north of Kingston, the CRCA has 5 volunteer maintenance coordinators who do more regular inspections to monitor existing conditions and potential problems.

- **Keep written records of monitoring and maintenance activities.**
Formal records chronicling the City's activities will be useful in court to show the City took appropriate action in response to reports of hazardous conditions.
- **Avoid describing or promoting facilities as "safe" or "safer" than alternatives.**
Safe is a relative term, not an absolute. There will always be some risk associated with the use of any facility. There may be a public perception that designated cycling facilities are safer than other roadways. That perception should not be augmented by safety claims made by the City.

Avoid classifying facilities for different users' skill levels. This acknowledges a variable element of risk that is difficult to quantify and would complicate the basis of liability claims. What risks would be acceptable to experienced pedestrians and cyclists, as opposed to novice pedestrians and cyclists? There should not be a difference. It is preferable for facility users to assess their capabilities themselves and govern their choices accordingly.

- **Maintain proper insurance coverage.**
Some liability is inevitable therefore; the City should maintain its public liability insurance policy as a safeguard against having to draw payment for damages from the public treasury.

9. Future Studies and Monitoring

- The City should initiate a more detailed study of pedestrian and cycling travel in the Kingston downtown waterfront, defined as the area between Macdonald Park in the west, Riverview Park in the east, and as far inland as Bagot Street. Pedestrian and cycling travel should be a “first principle” planning priority within this important area.
- The City should initiate a risk management and maintenance assessment of all key sidewalks, pathways and related public facilities. This assessment could include issues such as snow clearing, identifying potential trip hazards (i.e. differential settlement of pavement, streetscape obstructions), personal security and lighting, drainage, accessibility (i.e. ramps, intersection curb cuts), etc. This annual assessment will demonstrate that due diligence has been performed by the City in the case of negligence or claims against the City.
- The City should seek continued public participation and involvement for cycling and pedestrian facilities and programs. Surveys and counts are methods to monitor public opinion and satisfaction.

Conclusion

At the conclusion of a cycling and pathways study such as this, it is useful to summarize the most significant revelations and recommendations that have presented themselves over the course of the project. The following is a list of the major conclusions and observations that the Study consultants have to offer the City Kingston:

- Kingston has a unique potential. It could become a city that embraces and benefits from the many positive effects of a pedestrian and cycling focus. The size, character and make up of the City with the University and high number of tourists are well suited to pursue this practical and enlightened transportation alternative. However, there is much to be done. In comments about the *Transportation Master Plan's* ambitions for pedestrian and cyclists, a Kingston Councillor has stated, “Kingston’s future depends on citizen’s making some fundamental shifts in thinking...This is not going to be easy...This is not going to be painless.”
- Kingston has been slow off the mark with respect to pedestrian and cycling initiatives. Results are occurring elsewhere but not in Kingston. The Lake Ontario Waterfront Trail concept has transformed the profile and viability of municipal waterfronts in nearby places such as Cobourg and Pickering. The urban planners of major progressive Canadian cities are heeding the needs of pedestrians and cyclists. Yet Kingston has not adopted a proactive approach. What is the source of the City’s hesitancy? It is hoped that the *Kingston Cycling and Pathways Study* will help the City to focus on this issue and move forward.

- Kingston needs to muster the political will and direction to address pedestrian and cycling issues seriously. This is more than supporting a “motherhood issue”. It is a potentially expensive and challenging process that has the potential to physically reshape the community. Development budgets need to be secured, staff time needs to be allocated and agreements with MTO, private landowners and affected businesses need to be negotiated. Kingston needs to decide if pedestrian and cycling advances are important or not, then act accordingly.
- Without the benefit of proper direction, City staff and user / interest groups have done the best they can. Much of the current energy is being put into piecemeal projects. Again, it is hoped that this *Kingston Cycling and Pathways Study* will provide the needed direction. There are a number of specific situations that deserve mentioning:
 - The K & P abandoned railway should be acquired and developed.
 - MTO should be pushed to facilitate the required crossings of Highway 401.
 - The City should rally the federal government to improve public accessibility and use of key waterfront lands, and in particular the La Salle Causeway.
 - “Courtesy Crossings”, remote paved maintenance widenings, and consistent public access to “walkway” rights-of-way need to be reassessed. Creating facilities where they are easy to implement, rather than where they are needed, also needs to be reassessed. Boulevard pathways and isolated cycling lanes are examples of misdirected energy and effort.
- Everyone involved needs to work together. Through consultation with local interest / user groups, the CRCA, the KFL & A Health Unit and Loyalist Township, it is evident that the City of Kingston is not alone in the pursuit of improvements in cycling and pathways. Excellent knowledge and enthusiasm exists within the community. Success and change will often depend on the knowledge and enlightenment of City staff. Individuals who understand the needs and preferences of others will be invaluable in the endeavour to work cooperatively.
- Just do it. It is easy to look for excuses not to walk or cycle. Most of the actual deterrents are psychological. A lack of facilities or support programs does not mean these transportation alternatives cannot make a difference immediately. Initiating creative ways to inspire the community to get active is the first step. Strong participation will drive the necessary political will.

1.0 Introduction

1.1 Study Background and Context

In October 2002, the City of Kingston adopted a *Community Strategic Plan*. The *Community Strategic Plan* was the result of an extensive community consultation process. The *Plan* identified 12 initiatives to be acted upon during the life of the strategy. One of these initiatives was the Official Plan initiative.

The Official Plan initiative includes a Waterfront Strategy to develop a single updated and integrated approach to the waterfront and a *Transportation Master Plan* to provide a balanced and sustainable transportation system

Furthermore, there was increasing public demand for more recreational pathways and greater waterfront access. As a result, it was recognized that there was the need for a comprehensive review of the cycling and pathway systems for the entire new City of Kingston.

The purpose of the *Kingston Cycling and Pathways Study* is to provide the City and its' citizens with ideas and direction. This work has been based on thorough investigation of local opportunities and challenges. It has benefited from ongoing input from community user / interest groups and the general public, who have attended a number of meetings and open houses. The *Study* draws from the experience of other municipalities and, represents the state of the art in planning for pedestrians and cyclists. It also explores a number of misconceptions associated with these modes of transportation.

The *Kingston Cycling and Pathways Study* presents a vision of what could be. It recommends the programs and facilities that would provide pedestrians and cyclists with an obtainable level of reasonable service. The *Study* is not intended as an exercise in advocacy or to assess feasibility. The *Study* requires that the City, through its' staff, user / interest groups and citizens, rally and develop strategies to make the ideas presented a reality. The City of Kingston is approximately 453 square kilometres in area with the urban/ suburban area comprising 12 percent of the City's land base and 78 percent of the City's 2001 population of 114,195 persons. The City of Kingston is projected to have a population of nearly 147,000 persons (medium projection) by the year 2026.

There is over 150 kilometres of shoreline in the City, fronting on Lake Ontario, the St. Lawrence River, the Great Cataraqui River and the Little Cataraqui Creek. Currently, the City of Kingston waterfront pathway system extends approximately 19 kilometres.

The City has an abundance of parks, open space areas, recreational uses, historical and environmental sites and attractions, many of which could be linked with an improved pathway system. The City currently controls, through ownership / lease / right-of-way a significant amount of public open space, of which waterfront property is a major component. Two nationally renowned attractions include the Rideau Canal and Fort Henry.

The City of Kingston offers a variety of existing transportation components that give a wide range of choice to residents and visitors. The key transportation components include the following:

- Approximately 803 kilometres of roadways in a variety of roadway classifications;
- An existing waterfront pathway system in the former City of Kingston along part of the Lake Ontario waterfront and the Great Cataraqui River;
- An urban pathway system comprised of sidewalks, subdivision walkways and linear parklands;
- Limited on-road cycling facilities;
- A section of the Rideau Trail;
- Linkage to four regional highways including Highways Number 2, 15, 33 and 38 of which many locations have paved shoulders of various widths;
- A municipal airport, a regional bus terminal and a rail passenger station with regular VIA train service; and
- A municipal urban transit system consisting of standard buses.

The Waterfront Regeneration Trust, a not for profit organization, has been working to facilitate the regeneration of the Lake Ontario waterfront. Central in this regeneration is the long-term goal of implementing the Lake Ontario Waterfront Trail, a multi-use pathway/greenway extending from Niagara-on-the-Lake to Trenton and beyond. Locally, the Waterfront Working Group is working to extend the trail eastward from Napanee and the Glenora Ferry to connect to Kingston, Gananoque and Brockville.

Although there has long been interest in waterfront regeneration in the Kingston area, it was not until discussion for a new master plan for the Lemoine Point Conservation Area began that a local group was established to plan the extension of the Lake Ontario Waterfront Trail eastward.

There are four important studies / strategies which will impact this *Kingston Cycling and Pathways Study*. The *Kingston Transportation Master Plan*, a two-year project, expected to be complete in 2003, will propose integrated multi-modal improvements to the municipal transportation system. The *Urban Growth Strategy* will provide direction as to the areas of potential growth from the perspective of planning, servicing and financial considerations. *The Downtown Action Plan* will examine above ground infrastructure and landscaping in the downtown. It is to be completed in 2003.

The fourth strategy, a waterfront strategy, was identified in the *Community Strategic Plan* and selected by City Council as a priority item for completion. The City has completed an extensive waterfront public consultation exercise and is currently preparing a work plan to undertake a waterfront strategy. City Council, through waterfront visioning exercises in November and December 2001, established some broad principles for the waterfront.

The overall goal of the City and the *Kingston Transportation Master Plan* is to reduce automobile use and increase alternative modes of transportation; therefore, it is useful to know the existing levels of each mode with respect to cyclists.

As part of the *Kingston Transportation Master Plan* a household travel survey was conducted by telephone in January of 2002. The survey was based on a random selection of listed telephone numbers in the study area. Travel data was collected from approximately 5 percent of households. During the afternoon commuter peak hour, 82 percent of trips were made by automobile, 11 percent by walking, 6 percent by transit (3 percent school bus and 3 percent public transit) and just over 1 percent by cycling. It is acknowledged that the annual percentage of walking and cycling trips are likely greater than those reported in the survey, given that the survey was undertaken in January when the snow and cold temperatures discourage walking and cycling. As well, the extent of travel undertaken by the City's student population may have been underrepresented in the survey. Residential students may not have permanent phone lines. They may reside at a particular location on a temporary basis and thus, may not be included in Bell Canada's directory for the study area.

The average all-day trip length for the City was reported as 6.23 km. This is certainly a distance that can be traveled by most people cycling. The survey reported that 10.2 percent of all City trips made were by walking a distance of less than 2 kilometres.

To compare the modal split in Kingston, with other metropolitan areas, Statistics Canada reports the following on their website www.statcan.ca:

TABLE NUMBER 1

Five Metropolitan Areas in Canada with the Highest Proportion of Workers Cycling to Work are as follows:

<u>Top Metropolitan Areas</u>	<u>Proportion in 1996</u>	<u>Proportion in 2001</u>	<u>Change</u>
Victoria	4.9%	4.8%	-0.1%
Saskatoon	2.0%	2.5%	+0.5%
Kingston	2.1%	2.2%	+0.1%
Ottawa-Hull	2.1%	1.9%	-0.2%
Vancouver	1.7%	1.9%	+0.2%

In Canada, more people walked or cycled to work, combined, than rode as a passenger in someone else's vehicle. It is noted by Statistics Canada that car-pooling declined from 7.4 percent to 6.9 percent of all commuters between 1996 and 2001.

To put pedestrian and cycling travel into context in terms of their current importance, or potential for increase, comparisons are naturally made relative to the current dominance of the automobile. To put changes in perspective, doubling the proportion of commuter cyclists would still result in the cycling mode representing less than 5 percent of the total modal split. There is a long way to go to make significant changes to the status quo.

In terms of walking and cycling initiative in neighbouring communities, in 2000-2001, the County of Lennox and Addington and its constituent lower tier municipalities worked collaboratively to complete a County roads transportation study. One recommendation that was adopted by County Council was to establish a County Road Cycling Facility Technical Steering Committee to examine the opportunities for a countywide network using County roads as the spine.

The Committee was formed in late 2002 and has met twice in 2003. To date the following actions have:

1. Identified the County Roads that will have paved shoulders included when the road is resurfaced or rehabilitated.
2. Established paved shoulders at a 1.5 metre width, wherever possible.
3. Agreed to examine linkages with neighbouring counties and cities to create a regional system.

County Council must approve these Committee decisions before they are official.

The County has been including approximately 1.2 metre wide shoulders in its road-resurfacing budget for select County Roads since 1999.

The goal of the *Kingston Cycling and Pathways Study* is to introduce new, state of the art standards for potential facilities and programs that, if implemented, would greatly contribute to the increased awareness of pedestrian and cycling transportation. In reality, any significant changes to the transportation patterns of Kingston will evolve over time. This Study is the first step towards that greater goal of increased awareness.

1.2 Study Assumptions

The following represents the assumptions used in this Study. If clarification is required, some terms are defined in Appendix One - *Glossary of Terms* which is also located in *Volume 2 – Technical Appendices*.

- Off-road facilities would, wherever possible, accommodate a multi-use concept that would include appropriate users such as pedestrians, cyclists, runners, in-line skaters, skateboarders, those in wheelchairs and persons with physical disabilities using motorized scooters.
- A designated network of continuous linear facilities (pathways and roadways) will focus the public's attention on a number of identifiable interconnected travel ways in order to encourage use. It is expected that this will spark interest in the Facility Network and take away much of the "where to go" guesswork that might otherwise deter public use. Highlighting the existence and accessibility of facilities with signage, user maps and promotional information goes beyond suggesting "get out and have some fun exercising", it gives the would-be pedestrian or cyclist tangible, physical places to go.
- Another strategy of encouraging hesitant pedestrians and cyclists to take their first trips on designated facilities is to encourage them to eventually take longer, more varied trips, on and beyond the designated system, as their confidence and ability increases.

- Designation is the fundamental act in establishing authorized cycling, pedestrian and multi-use pathway facilities. Designation can entail signage, pavement markings or highlighting on a user map through the Official Plan or in promotional information.
- Some pathways, because of their environmental sensitivity, steepness of grade, potential for crowding and inability to be widened or twinned are not suitable for use by cyclists or in-line skaters.
- Safe is a relative term, not an absolute. There is always some risk associated with using a pathway or cycling facility. Consequently, no facility should be referred to by the City as being “safe”.
- All public rights-of-way are generally open to and will be used by cyclists and pedestrians, except for limited access highways such as the 401. In general, cyclists are encouraged to travel on roads integrated with other vehicular travelers.
- The bicycle is considered to be a vehicle by the *Ontario Highway Traffic Act*. Cyclists have the same rights, duties and responsibilities as motorists when operating their vehicle on a public roadway. As stated in Kingston’s municipal by-laws, cyclists are not allowed to travel on sidewalks. Anyone, regardless of age, skill or knowledge, may legally operate a bicycle.
- Certain roadways may serve the needs of particular types of users better than others. Designated facilities are not necessarily better than undesignated roadways. Many inexperienced cyclists complain that the well-known arterial roads where they normally drive their cars are too narrow and fast paced for them to comfortably ride a bicycle. A designated route provides guidance and reduces an inexperienced cyclist’s insecurities about using the facility, such that it decreases the fears of getting lost or ending up on a busy dangerous road.
- For the purpose of this Study the Kingston “urban area” has been differentiated from the rural and regional context by the constraints of the Facility Network Master Plans. The focus of facilities is in the urbanised area of Kingston bordered roughly by Bur Brook Road, the Lake Ontario waterfront, the Lemoine Point Conservation Area and the Butternut Creek Swamp Forest. The Study urban area is larger than the “urban area” defined in the Official Plans.

2.0 Methodology

2.1 Summary of Methodology

The following is a brief summary of the steps the Study consultants followed during the course of the *Kingston Cycling and Pathways Study*:

- A review took place of previous studies, reports, mapping, correspondence and meeting minutes relevant to the Study as supplied by the City. The purpose of this background search was to uncover past events, determine the location of existing facilities and proposed facilities by others, as well as to establish a list of issues to be dealt with in the Study.
- A digital (AutoCAD) base plan was developed from information supplied by the City. Regional context, urban area and downtown waterfront focussed maps were produced.
- The Study prepared an inventory of existing linear facilities and conceptual linear facilities proposed by those other than the City. Initially the source of information was the review of previous studies and mapping. This information was confirmed in the field by the consultants and then shown on the Study Facility Network Master Plans. These plans were displayed at public open houses and at meetings with user / interest groups, where additions and corrections were made. The Cultural Services, Engineering and Planning Divisions also reviewed these plans. For the results of the inventory see Appendix Two – *Inventory of Existing Facilities, Including Facilities Proposed by Others* in *Volume Two – Technical Appendices*.
- Lists of destinations relevant to pedestrians and cyclists were compiled. Recreational, utilitarian, student and tourist interests were anticipated.
- Facility Network Master Plans were developed initially on the field checks of linear facilities proposed by others, but also on study and investigation by the consultants in the field. The road network, open space systems and anticipated desire lines for users that could cross private property were all investigated for potential facilities. In all cases the connection of destinations and the continuity of facilities was the desired objective.
- Public Consultation was addressed in a number of ways:
 - The general public was invited to attend three open houses that were facilitated. The consultants were available to answer questions and comment sheets were circulated for written input. As a result of the public open houses numerous e-mail and letter correspondences were received. Comments were recorded and incorporated appropriately.

- To ensure that input was received from the various user / interest groups and clubs who have particular knowledge of pedestrian and cycling issues in Kingston, meetings with specific interest groups were also held. For a list of the participants and meetings see Section 2.2, User / Interest Groups and Section 3.1, Public Consultation. These meetings were useful to confirm facility proposals, recommendations and the implementation strategies. The consultants used and reviewed other technical manuals, resource information and relied on previous studies experience.
- The City maintained information about the Study on the City's website www.cityofkingston.ca. A downloadable comment sheet was available.
- Meetings with the Study Steering Committee and their key municipal divisions – Planning, Engineering and Cultural Services, were held.
- An initial draft Study report and a final Study report were produced and circulated for comments from City staff, the Cataraqui Region Conservation Authority (CRCA) and the general public through the City website.
- A presentation was made to the Planning Committee and City Council.

2.2 User / Interest Groups

To date, the *Kingston Cycling and Pathways Study* has received input from the following organizations and user groups:

- Kingston Bicycling Advisory Committee
- Kingston Velo Club
- Cataraqui Region Conservation Authority
- Loyalist Township Planning Department
- Lake Ontario Waterfront Working Group
- Rideau Trail Association (Hiking)
- Seniors Association - Kingston Region
- Kingston Multi Sport (Triathlon)
- K & P Trail Interest Group
- Kingston Trail Riders Association (Equestrian)
- Portsmouth Villagers Association
- Provincial Cycling Route Network
- Kingston Wetlands Working Group
- Meadowbrook Area Community Association
- Kingston Independent Living Resource Centre

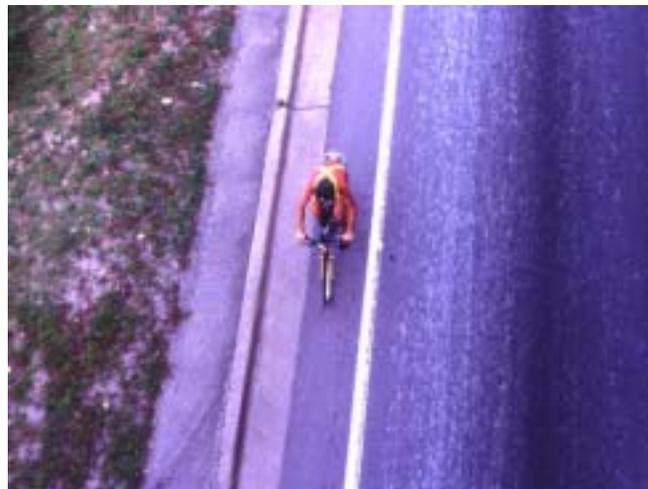
- Kingston Area Land Conservancy
- Valley Lands Group
- Queen's University (School of Urban and Regional Planning)
- Safe Access For Everyone
- Kingston, Frontenac, Lennox and Addington (KFL & A) Health Unit

In addition to this list, many individual citizens have made comments and attended public events. Other groups not mentioned above were invited to participate in the Study.

The City's original Kingston Bicycle Advisory Committee (KBAC) was a Committee of Council. It was established in July 1990 and disbanded in May 1994. The purpose of the Committee was to:

1. Promote the use of the bicycle as a form of transportation in Kingston and area, for reasons of improved health and fitness, reduced pollution, energy conservation, reduced parking demand, and increased tourism.
2. Explore the possibilities of bicycle paths and routes within the city.
3. Educate cyclists and motorists to improve cycling safety through mutual respect and co-operation.

Kingston currently does not have a Committee of Council providing input on cycling or pedestrian issues. The existing Kingston Bicycle Advisory Committee (KBAC) is an independent organization.



Existing Users

2.3 Development of the Facility Network Master Plans

The following discussion provides background on the issues and realities that directed the consultants in the development of the three Facility Network Master Plans plus the Regional Context Master Plan.

Although pedestrian and cycling travel is typically planned together, as it in this Study, in reality the travel motivation and preferences of a mother with a baby stroller, a teenage in-line skater and a training triathlete are all quite different. The challenge of providing facilities for the wide range of potential users has caused the Study to focus facilities on three major user categories that include:

- pedestrians, typified by strollers, hikers and dog walkers;
- recreationalists, typified by leisure, fitness and tourist pedestrians, cyclists and in-line skaters;
- utilitarian cyclists, typified by commuters and all-purpose cyclists.

In Canada, planning efforts to encourage walking and cycling have created few major accomplishments or benchmarks for Kingston to strive towards. The majority of facilities relate to sections of suburban and rural off-road pathway. If widespread, continuous networks of urban off-road pathways are the goal, then rare successful examples of this approach would be Calgary, Edmonton and Ottawa-Hull. The Lake Ontario Waterfront Trail, Quebec's La Route Vert and some sections of the Trans Canada Trail (primarily abandoned railway conversions) have demonstrated that significant infrastructure improvements can be made in favour of recreational pedestrians and cyclists.

Toronto and Montreal have demonstrated ways of facilitating urban cycling on arterial roadways with on-road cycling lanes. These projects have involved challenging accomplishments including removing on-road automobile parking, reducing the number of travel lanes and road widenings. Toronto, Ottawa and Montreal have all established sophisticated, yet different, cycling advisory and advocacy groups that interact with local government on cycling issues. Interestingly though, public participation and acceptance of on-road utilitarian cycling has not grown. It remains at approximately only 2 percent of all trips. The development of on-road ideal cycling facilities suffers from a lack of consensus in terms of what to do.

Planners and engineers have been given the opportunity to solve the cycling dilemma. The theoretical results of their efforts are probably best expressed in guidelines produced by the Ontario Ministry of Transportation (MTO), Transportation Association of Canada (TAC) and the American Association of State and Transportation Officials (AASHTO). However, the failure of cities to effectively implement these ideals is significant.

It is important to understand the difference between planning facilities from a "vehicular cycling approach" rather than a "cycling - inferiority approach". It is recommended that in Kingston a "vehicular cycling approach" be adopted.

The challenges involved in providing useful improvements to cyclists has been summarized in the document *The Dilemmas of Bicycle Planning* by Paul Schimek, 1997. The author describes the numerous public misconceptions associated with cycling and the ways that authorities have side stepped making effective improvements. Clearly the emphasis has to be in creating a situation where cyclists are confident and with sufficient skills to be fully integrated with motorists on existing roads. Establishing rights and responsibilities with encouragement and enforcement programs, as well as providing “vehicular” cycling training opportunities on a broad community wide scale, are seen as the alternative approach. Providing expensive facilities that tend to segregate and alienate cyclists from transit users, pedestrians and motorists has not evolved as the answer.

There are two ways of addressing on-road cycling facilities:

- One is to spread out improvements and designation efforts. Focus on low-profile roads that have a lower relative cost and degree of complication to satisfy designation standards. This offers the most benefit to the broadest range of cyclists. More can be done.
- Another is to concentrate improvements and designation efforts. Focus on the most challenging roads used by existing cyclists. Make improvements to high-profile roads that put cycling into the “main stream” (i.e. Princess Street). Such raises the profile of cycling facilities. Less can be done for the same amount of funding.

In the *Kingston Cycling and Pathways Study* a combination of the above has been proposed.

3.0 Findings

3.1 Public Consultation

The following is a list of public consultation meetings that were held over the course of the *Kingston Cycling and Pathways Study*.

- First Meeting with Interest Groups:
Kingston City Hall, Memorial Hall, September 18, 2002.
- First Public Open House held in conjunction with the *Transportation Master Plan* and the *Urban Growth Strategy*:
Kingston City Hall, Memorial Hall, November 13, 2002.
- Second Meeting with Interest Groups:
Kingston City Hall, Loyalist Room, November 28, 2002.
- Second Public Open House:
Glenburnie Fire Hall, Meeting Room, March 5, 2003.
- Third Meeting with Interest Groups:
Johnson Street Public Library, Delahaye Room, March 27, 2003.
- Third Public Open House:
Kingston City Hall, Memorial Hall, August 26, 2003.

Typically, the Study consultants presented information on existing and proposed facilities on large-scale maps with alignments shown highlighted in colour. A summary of work to date was given. A question and answer session was facilitated at all of the meetings with user / interest groups, as well as at the second and third public open houses. The consultants collected comment sheets, letters and other written submissions from the general public and user / interest group members. This material was reviewed and acted on appropriately. Generally speaking the public consultation was upbeat and positive.

3.2 Opportunities and Constraints

These opportunities and constraints are based on the consultant's experience and findings.

Opportunities

Kingston has the potential to build on a number of opportunities that exist in the city relating to both physical realities and social situations.

- The City benefits from access to the Lake Ontario and the Great Cataraqui River waterfronts. The waterfront sharply defines the physical boundary of the city to the south and divides Kingston East from the rest of the City.
- Although broken somewhat by the Great Cataraqui River, the Little Cataraqui Creek and Highway 401, urban development in Kingston is focused in areas that can be traveled across easily by most cyclists and many pedestrians.
- The City has a compact and vibrant downtown and University that remain the cultural and commercial heart of the area. Suburban shopping malls have proliferated, but have not yet dominated.
- Although winter can involve long periods of snow cover, it is possible to walk or cycle the majority of the year. Kingston is relatively flat and benefits from air quality, compared to other cities, that supports physical exercise.
- Kingston has four significant demographic groups that are particularly interested in pedestrian and cycling travel, those being college and university students, visiting tourists, active seniors and urban professionals.



Confederation Park

- Kingston possesses exceptional existing natural resources on which new and improved facilities could be built. They include the Little Cataraqui Creek Conservation Area, the Lake Ontario waterfront and St. Lawrence islands, the abandoned K & P rail corridor, as well as an accessible rural landscape that surrounds the City.
- Improving cycling and pedestrian opportunities in Kingston has been a priority requested by the public.

Constraints

Kingston is behind most other Ontario communities in terms of providing facilities and programs to its citizens and tourists for pedestrian and cycling travel. Most off-road pathways are substandard, and there are limited existing on-road cycling facilities. There is currently no City department or public group set up to deal specifically with pedestrian and cycling issues although some user groups may be trying to carry out this role.

Most Ontario municipalities, similar to Kingston in size, have already studied pedestrian and cycling issues in their communities and produced master plans to guide in their development. In most cases facilities have been built and the situation is being reconsidered with a new round of studies, examples include Ottawa, Windsor and Guelph.

Given the size and generally favourable conditions for walking and cycling that exist in the City, the constraints that occur in other municipalities may have not previously forced Kingston to address its situation more vigorously. The City is also “new” from amalgamation in 1998. Other municipalities may lack the public ownership of waterfront and parkland, something that Kingston enjoys. Other municipalities have felt the negative effects of urban sprawl and traffic congestion and have responded by attempting to provide relief through pedestrian and cycling opportunities.

Although other municipalities have not necessarily acted on what they have learned through experience, the level of sophistication in terms of knowing what is involved in planning for cycling and pathways facilities has been raised. An objective of this *Kingston Cycling and Pathways Study* is to increase the knowledge base and raise the level of sophistication of Kingston’s staff and citizens on pedestrian and cycling issues.

- The Great Cataraqui River, Little Cataraqui Creek, Canadian National Railway and Highway 401 are the major barriers to travel for pedestrians and cyclists in Kingston. New grade-separated crossings of these barriers are generally prohibitively expensive. At-grade crossings of railways, especially busy mainlines which is the case through Kingston, are particularly difficult to negotiate and establish.
- Although comparatively flat, there are a number of hills associated with valley slopes that challenge cyclists. Highway 2 and Fort Henry Drive east of Highway 15

and Division Street north of Highway 401 and over the CNR rail bridge are examples.

- The typical width of Kingston's existing roadway lanes is not generous. In many cases the width of curb lanes is 3.5 metres, which makes the sharing of road space by motor vehicles and cyclists difficult.
- Private properties and high-security federal lands that cannot be accessed by the public are a significant constraint to off-road pathway development. It is hoped that the City will endeavour to acquire lands, or negotiate easements on lands, that are critical to the continuity of key off-road pathways. This is particularly true of lands associated with the waterfront. The following is a list of significant constraint properties:
 - Dupont Canada Inc. property
 - Elevator Bay Developments, Commodore's Cove, The Waterside residential developments.
 - Kingston Psychiatric Hospital has an existing easement pathway.
 - Bayshore Apartment – Mowat Ave.
 - Portsmouth Olympic Harbour Marina – Search and Rescue Station Office
 - Corrections Canada – Kingston Penitentiary
 - City of Kingston Water Treatment Plant – King Street West
 - Kingston General Hospital – King Street West parking lot
 - Cataraqui Region Conservation Authority – floodplain restrictions.
 - Edgewater Residence – Emily Street
 - Kingston Yacht Club – Maitland Street
 - Shipyard Apartment – Ontario Street
 - Maritime Heritage Centre (Marina Museum of the Grand Lakes / Pump House Museum)
 - Quicklaw Office – The Admiralty Apartment
 - Gillan Engineering Construction – Block D
 - Downtown Hotels – Radisson Inn, Howard Johnson, Holiday Inn
 - Gas Station / Tim Horton's – Ontario Street (no water frontage)
 - Queen Street Dock – proposed for a hotel
 - Ferries and Cruises – Barrack Street Dock
 - Department of National Defence – Fort Frontenac, Canadian Forces Base Kingston
 - St. Lawrence Marina (Anglin Bay)
 - Rowing and Canoe Club (Emma Martin Park)

- City of Kingston Main Pumping Station – River Street
- Village Drive Apartment - Montreal Street
- Ministry of Public Works – crown lands along Greater Cataraqui River north of Hwy. 401
- Department of National Defence –St. Lawrence Parks Commission – Fort Henry
- Lakeshore Boulevard and private beaches
- Awlington Place private beach



La Salle Causeway

4.0 Recommendations

4.1 Summary of Recommendations

The following is a summary list of recommendations made by the Study consultants, based on their experience and expertise.

4.1.1 City Policy

The City should adopt policies that support pedestrian and cycling travel with clearly defined positions on specific issues, including:

- Priority should be given to persons with physical disabilities. Physically disabled individuals should be given first consideration; pedestrians over cyclists; cyclists over public transit operations and motorists; and public transit operations over motorists. The assumption that motorists have first priority in the public transportation system should be challenged.
- Wherever possible modes of travel should compliment each other. Multi-modal trips should be encouraged. Bicycle racks on transit vehicles are an example of this potential. The City has proposed a trial program of bicycle racks on City buses in 2004, to be dubbed “Rack and Roll”.
- The City should actively promote pedestrian and cycling travel as progressive, socially responsible and enjoyable. Highlight the benefits of alternatives to automobile dependency. They include but are not limited to environmental, health and fitness, convenience and money saving benefits.
- The City should lead by example. Adopt programs to encourage walking and cycling by City employees.

4.1.2 Existing Facilities

The City should make the primary infrastructure (sidewalks, pathways and roadways), conducive to comfortable and efficient travel by pedestrians and cyclists. The following objectives are recommended:

- In “urban areas” (as used in this study), public rights-of-way should have at least one continuous, hard surfaced linear facility for the use of pedestrians. (i.e. a concrete sidewalk on at least one side of the public roadway.) An example of where sidewalks are missing as of 2003 is Third Avenue, between Victoria Street and Macdonnell Street.

- Where continuous, paved facilities are not feasible along both sides of a roadway, approved standard crossing facilities should be installed to provide access to the continuous facility on the single side. In some cases a sidewalk exists on one side of the roadway, however, because of site-specific conditions a sidewalk on both sides may be required. An example of where sidewalks are missing as of 2003 is King Street West, east of the Kingston Penitentiary to Beverley Street.
- Sidewalks should not be placed directly adjacent to the roadway where the posted speed limit of the roadway is greater than 50 km per hour. A separation distance (i.e. a boulevard) or barrier is recommended between the roadway and the sidewalk where possible.
- The typical operating space of on-road cyclists is the outside or curb lanes of municipal roadways. They should be efficient and comfortable for through-travel by cyclists. The surface of the roadway, the gutter area and utility covers (i.e. manholes and catch-basins) should be sound and bicycle-compatible. The surface of bridges (i.e. metal grating on the La Salle Causeway in 2003) and railway track crossings should be reviewed and made bicycle-compatible. The Causeway is owned by Public Works Canada.
- Special attention should be given to anticipating the operating movements of cyclists through multi-lane and signalized intersections. All multi-lane signalized intersections should have adequate lane space for waiting and turning cyclists. Cyclist's needs for road space should not be compromised.
- Attention should be given to how the typical operating space required by cyclists in outside or curb lanes is affected by right turn lanes, highway on / off ramps and major driveways. A continuous operating space is required.
- Before existing paved shoulders / maintenance widenings can be designated (i.e. with signs and/or on maps) as cycling facilities, they should be evaluated and upgraded to standard conditions of service. The continuity of paved shoulders and maintenance widenings should be reviewed at specific problem areas and amended appropriately.
- Eventually all intersection signals actuated by under-road sensors should be upgraded to employ activation sensors (i.e. quadruple loops) that respond to bicycles. As priority conversions, signalized intersections located on roadways identified on the Urban Area - Utilitarian Cycling Focus and Recreational Focus Master Plans should be upgraded first.
- The City should remove existing signs that are not consistent with new policies once adopted. Examples are the following:
 - numerous old Waterfront Walkway / Pathway signs
 - green signs of the existing but discontinuous Kingston cycling route
 - cycling-prohibited sign on Gardiners Road northbound, north of Bath Road.

4.1.3 Future Facilities and Master Plans

The City should adopt the following four Facility Network Master Plans, developed through this *Kingston Cycling and Pathways Study* as attached, as schedules in the new Official Plan:

- Regional Context - Existing Facilities & Master Plan
- Urban Area - Pedestrian Focus Master Plan
- Urban Area - Recreational Focus Master Plan
- Urban Area - Utilitarian Cycling Focus Master Plan

These plans should be maintained digitally by the City for future reference and would guide the planning and development of citywide future facilities intended specifically for pedestrians and/or cyclists.

- Once adopted, the City should dedicate funds to begin the phased implementation of the facilities, programs and policies recommended by this *Kingston Cycling and Pathways Study*.
- The City should attempt to systematically acquire or negotiate public access agreements on properties with important waterfront and pathway connectivity potential.
- With regard to the future of Highway 401, the following facility crossings are recommended:
 - Westbrook Road bridge over Highway 401 (No roadway changes anticipated.)
 - K & P abandoned railway (MTO to install a reduced sized culvert – from the existing 8.6 m height to a proposed 5.0 m height corrugated steel pipe culvert.)
 - Between the abandoned K & P railway and the Little Cataraqui Creek Conservation Area. (Rebuild the existing culvert to accommodate both the Little Cataraqui Creek and a 3.3 metre wide asphalt multi-use pathway or develop a new independent tunnel for a 3.3 metre wide asphalt multi-use pathway.)
 - Division Street / Perth Road (Install sidewalks on at least one side of the roadway. Widen the roadway curb lanes to 4.25 metres or install 1.5 metre cycling lanes.)
 - Montreal Street / Battersea Road (Widen roadway to incorporate minimum 1.2 metre wide paved shoulders continuous through the interchange.)
 - CN Railway underpass (Install chain link fencing and grading of ground adjacent to the existing overhead telephone line, east of the tracks.)
 - Montreal Street / Highway 15 (Widen roadway to incorporate min. 1.2 metre wide paved shoulders continuous through the interchange.)
 - Joyceville Road (Widen roadway to incorporate minimum 1.2 metre wide paved shoulders continuous through the interchange.)

4.1.4 Facility Standards and Guidelines

The Study recommends that the City should adopt standards and guidelines for the development of new facilities and the redevelopment of existing facilities for pedestrians and cyclists that are based on established principles and newly adopted City policies. Standards and guidelines should be applied consistently. For a complete list of guidelines see Section 4.4, Facility Design, and Maintenance Guidelines. The guidelines recommend that:

- The City should be cautious not to promote the use of facilities (i.e. with designation signage or with promotional programs) that do not meet minimum performance standards.
- Standards for on-road cycling facilities should generally be consistent with the Ontario Ministry of Transportation *Bikeways Planning and Design Guidelines*, March 1996 and the Transportation Association of Canada *Bikeway Traffic Control Guidelines for Canada*, December 1998. Additional relevant guidelines are included in this *Cycling and Pathways Study*.
- Standards for off-road facilities for pedestrians, cyclists and other pathway users should generally be consistent with the Waterfront Regeneration Trust *Design, Signage and Maintenance Guidelines*, April 1997. Additional applicable guidelines are included in this *Cycling and Pathways Study*.
- All new urban multi-use pathways or existing pathways that are to be rebuilt should be a minimum of 3.0 metres wide in consideration of pedestrians, cyclists and in-line skaters.
- The recommended minimum width of a public right-of-way corridor intended to include a multi-use pathway is 10 metres. This minimum width allows for the potential inclusion of a 3.0 metre wide pathway, horizontal clearance distances, landscaping (i.e. shade trees), seating areas and property line fencing. Where it is necessary to make a vital off-road connection between existing and/or potential facilities, an absolute minimum corridor width of 5.0 metres would be acceptable.
- All new urban arterials and urban collectors that are to be rebuilt should be reconfigured to have, at a minimum, wide curb lanes (i.e. minimum 4.25 m wide) in consideration of cyclists. As priority conversions, cycling routes located on roadways identified on the Urban Area - Utilitarian Cycling Focus and Recreational Focus Master Plans should be upgraded first and others as opportunities arise.
- All new rural cross section roadways and rural cross section roadways that are to be rebuilt should have paved shoulders (i.e. minimum 1.2 m wide) in consideration of cyclists. As priority conversions, cycling routes located on roadways identified on the Urban Area - Utilitarian Cycling Focus and Recreational Focus Master Plans should be upgraded first.
- In future traffic calming exercises, the City should exempt cyclists from signed turn restrictions. Cyclists should be “filtered” through traffic diverters and speed humps so as

not to adversely affect their access and momentum. Traffic calming is proposed to slow down the speed of traffic or to avoid motor vehicle traffic from passing through residential areas. These problems do not apply to cyclists and therefore cyclists should be exempt from access and turn restrictions.

- The maintenance level of outside or curb lanes on all arterial and collector roadways identified on the Urban Area - Utilitarian Cycling Focus and Recreational Focus Master Plans should be increased to equal that currently on roads. This should include pothole and crack repairs, utility covers repairs and adjustments, street sweeping, snow clearing and general troubleshooting.
- The City should avoid the future development of boulevard pathways, except where short lengths of this type of off-road facility can bridge the gap between otherwise discontinuous linear facilities. Boulevard pathways that simply parallel arterial roads where other opportunities may be available should not be developed. Refer to Appendix One - *Glossary of Terms* for a definition of boulevard pathways.
- Where major multi-use pathways or other high profile pedestrian facilities cross high-traffic-volume, high speed and / or multi-lane arterial roads mid-block it is recommended that only demand-activated signalized crossings be installed. These signals should be visual and audible traffic signals. This system allows pathway or sidewalk users by use of a push button, to activate a red traffic control signal light to stop vehicular traffic in order that pedestrians can cross. Textural pavement changes should occur to indicate facilities for the visually challenged.
- Where major multi-use pathways or other high-profile pedestrian facilities cross lower-traffic-volume, lower-speed and / or two-lane collector and local roadways it is recommended that crossing facilities acceptable to the City be installed.
- The City should expand the program of providing secure bicycle parking facilities. The City should continue to install facilities such as the successful “post and ring” lock-up or other facilities that support the bicycle frame and allows at least one wheel and the bicycle frame to be locked. These facilities should eventually be provided citywide at appropriate locations along city streets, at public transit transfer stations and at major workplace, parkland, education, tourism and shopping destinations. It is further recommended that the City should lead by example and install bicycle-parking facilities at municipal offices and city-owned buildings.
- Design high-quality designation signage for all future multi-use and pedestrian-only pathways. Only post designation signs where the facilities meet acceptable standards.
- The City endorses the principles of environmental protection. It recognizes that a sensitively planned and implemented off-road pathway system is consistent with those objectives. The City should initiate a comprehensive pathway management program to ensure there is adequate monitoring, signage and public education that has regard for environmental protection.

- The City should consider lowering the posted maximum speed on local residential streets and significant sections of roadway (i.e. in the vicinity of schools and cycling priority roadways) to 40 kilometres per hour.
- The City should consider moving on-road parking on one-way streets consistently to the left side of the roadway in consideration of cyclists who conventionally travel on the right side of the roadway.

4.1.5 City By-Laws

Overall, the City should amend by-laws that regulate off-road travel by pedestrians and cyclists. Many of the existing by-laws are dated in their terminology, overly complicated and in a practical sense difficult to enforce. For current by-laws relating to pedestrians and cyclists refer to Appendix Seven in *Volume Two – Technical Appendices*. Specific recommendations include the following:

- By-law 38-10 (former City of Kingston) should be rewritten to exempt children under 10 years of age from being prohibited from riding on sidewalks.
- By-laws regulating pedestrian and cycling travel along the Lake Ontario waterfront and specific neighbourhoods should be consistent with the by-laws regulating other City off-road facilities and other City by-laws. By-laws 59-3045 and 64-4729 excluding cyclists from certain “walkway” rights-of-way should be repealed.
- By-law 94-100 (former City of Kingston) should be replaced. The current Waterfront Walkway / Pathway should be redefined. It is recommended that a restricted use facility be identified as the section of the future Kingston Waterfront Trail located immediately adjacent to Lake Ontario between Barrie Street, Anglin Bay and the Fort Henry Drive / Duty Drive/ Highway 2 intersection, and it should be reserved as a pedestrian-only precinct due to potential user conflicts with cyclists and in line skaters. Riding cyclists and in-line skating should be prohibited. Riding cyclists and in-line skaters should be facilitated elsewhere.
- By-laws 9, 229 and 96-119 (former City of Kingston) concerning licensing of bicycles should be repealed. Current compliance is low. Enforcement and administration likely cost the City more than the collected fees generate in public revenue.
- The City of Toronto has the following by-law in place with regard to cycling lanes:

“A motorist may ONLY enter a bicycle lane in order to enter or exit a private lane or driveway; to drop off and pick up disabled persons as defined in the *Highway Traffic Act*; or to make a right turn at a road intersecting a bicycle lane.”

A similar by-law for Kingston and strict ongoing enforcement is recommended.

4.1.6 Planning Issues

- The City should assign an individual staff member to manage cycling and pedestrian issues, programs and development. This position would be an important liaison between various City divisions, user / interest groups and the general public.
- The City should work in close co-operation with the other local groups and authorities that are planning and implementing cycling and pathway facilities and programs. This would include the Cataraqui Region Conservation Authority, adjacent municipalities, the Waterfront Regeneration Trust and other levels of government (i.e. Ministry of Transportation Ontario, Corrections Canada, Department of National Defence, Parks Canada, etc.). The City should consult with CRCA technical staff on an ad-hoc basis, for example, when a subject pathway would affect a CRCA property or if it is located near an environmental feature (i.e. floodplain or wetland).
- New development and redevelopment should be evaluated through site plan approval in terms of its accommodation of pedestrians and cyclists (i.e. direct accessibility, sidewalks, bicycle parking, snow clearing, personal security, etc).
- The City should not accept linear parkland dedications from developers adjacent to roadway rights-of-way if the intention is to develop boulevard pathways within them. Boulevard pathways are typically two-way multi-use pathways located on one side of a roadway in the boulevard with the purpose of duplicating or replacing the on-road cycling use of the roadway. They should not be developed or encouraged unless there is no other alternative. Multi-use pathway development should be associated with linear open space systems based on off-road (i.e. through sub-division) and/or natural systems (i.e. valley lands). Cyclists should either be cycling on the roads with vehicle traffic or well separated from the roads on multi-use pathways. Boulevard pathways raise safety concerns particularly in ways cyclists interface with intersections. Boulevard pathways put cyclists in a position where they surprise motorists, which potentially could cause accidents.

4.1.7 Support Programs

- The City should seek out and establish partnerships with organizations in the community that would share in the provision of support programs. Those potential partners would include the CRCA, local businesses, the KFL & A Health Unit and advocacy, sports and environmental groups, etc.
- Provide *Can-Bike* training courses to the public of all ages. The City's Cultural Services Division could administer these courses, which could be a municipal program run at community centres. *Can-Bike* has programs specifically created for school-age children. These could be made available through the Boards of Education.
- Continue to support the community walking groups program, *Walk On*.

- A similar approach to *Walk On* could be introduced for cyclists. Existing Bicycle User Groups (BUGs) have been created at Queen’s University, MTO and OHIP. New support groups should be encouraged or introduced at other schools, businesses and institutions.
- Continue the annual “Kingston Bike Week” or “Walk to Work” promotion day(s) or week.
- Reintroduce the “Kingston Share the Road” motorist / cyclist awareness campaign.
- When establishing new types of facilities (i.e. road crossings, or multi-modal roadways), the City should proceed with an extensive public education campaign addressing the background and operations of the new facilities. This could include the distribution of pamphlets, radio announcements and newspaper advertisements, along with information signs located at strategic points of entry to the City.
- Initiate a police enforcement campaign for responsible cycling, pedestrian and motor vehicle use. For cyclists, target infractions including failing to stop where legally required, riding on sidewalks and not having appropriate lights at night. For pedestrians, target jaywalking and proper use of crosswalks. For motorists, target opening doors into cyclists, failing to signal turns and illegal parking and standing.
- Establish Citizen Advisory Committees that would provide the City with on-going input on pedestrian and cycling travel issues made up of citizens and City staff.
- Target students, seniors and other groups for pedestrian and cycling awareness and education programs, through student media, social and orientation events.
- A balance should be found between building pedestrian and cycling facilities and supporting education programs, so that these facilities are used in the best manner possible, by cyclists, pedestrians and motorists alike. Funding that is spent on expensive facilities may be unavailable for education programs. It is a good idea to consider the cost effectiveness of facility development balanced with potential education, encouragement and enforcement programs that may prove to be desirable or preferable.

4.1.8 Methods of Managing Risk and Liability

The following methods of reducing risk should be initiated to help Kingston minimize the liability associated with providing designated facilities.

- **Reduce accidents.**

Improving the physical environment, increasing public awareness of the rights and obligations of cyclists and pedestrians and improving access to educational programs are all positive steps that will reduce the likelihood of accidents occurring and lawsuits being initiated by injured parties. Although these improvements may also promote increased use of pathways and road facilities, increased use operating in improved conditions must be viewed as a preferable situation to the do nothing alternative.

- **The selection, design and designation of facilities should conform to the highest prevailing standards.**

The City has shown due care by initiating this in-depth *Kingston Cycling and Pathways Study* and by employing experts in the specific field of multi-use pathways and cycling transportation. In terms of the design of future City facilities and programs, it is recommended that designers have knowledge of current appropriate design standards and trends.

This *Kingston Cycling and Pathways Study* has incorporated standards from the Waterfront Regeneration Trust *Trail Design, Signage and Maintenance Guidelines*, Canadian Institute of Planners (CIP) *Community Cycling Manual*, the Ministry of Transportation (MTO) *Bikeway Guidelines*, the American Association of State Highway and Transportation Officials (AASHTO) *Guide for the Development of Bicycle Facilities*, as well as guidelines from other North American transportation planning agencies and those responsible for multi-use pathways.

Regulatory signs, as identified by the MTO *Manual of Uniform Traffic Control Devices*, should be used to indicate the applicability of legal requirements that might not otherwise be apparent.

- **Facility design should comply with all applicable laws and regulations.**

Proposed on-road facilities should be designed in complete compliance with the Ontario *Highway Traffic Act* and current municipal legislation. Off-road pathways should be designed to meet current and accepted municipal standards.

- **Maintenance operations should conform to acceptable standards.**

Remove all cycling hazards from public roadways. Remove all pedestrian and cyclist hazards from pathways. If a hazard cannot be removed, it must be isolated with barriers or notified by clear warning signage.

- **Monitor, on a regular basis, the physical conditions and operations of roadways and pathway facilities.**

Regular inspections should be made to identify design oversights, deteriorations and new developments that present themselves as hazards. The individuals making these inspections should be trained in assessing hazards that are specific to the use of cyclists and pedestrians in urban conditions and on multi-use pathways. All reports of hazardous conditions received from cyclists, pedestrians, police or others should be promptly and thoroughly investigated.

It is noted that the insurance company for the Cataraqui Region Conservation Authority (CRCA) encourages the CRCA to make at least one property inspection, preferably two, on an annual basis. This is in response to “due diligence” procedures and the responsibility for public safety. On the Cataraqui Trail, north of Kingston, the CRCA has 5 volunteer maintenance coordinators who do more regular inspections to monitor existing conditions and potential problems.

- **Keep written records of monitoring and maintenance activities.**

Formal records chronicling the City's activities will be useful in court to show the City took appropriate action in response to reports of hazardous conditions.

- **Avoid describing or promoting facilities as "safe" or "safer" than alternatives.**

Safe is a relative term, not an absolute. There will always be some risk associated with the use of any facility. There may be a public perception that designated cycling facilities are safer than other roadways. That perception should not be augmented by safety claims made by the City.

Avoid classifying facilities for different users' skill levels. This acknowledges a variable element of risk that is difficult to quantify and would complicate the basis of liability claims. What risks would be acceptable to experienced pedestrians and cyclists, as opposed to novice pedestrians and cyclists? There should not be a difference. It is preferable for facility users to assess their capabilities themselves and govern their choices accordingly, which is the prevailing situation.

- **Maintain proper insurance coverage.**

Some liability is inevitable; therefore the City should maintain its public liability insurance policy as a safeguard against having to draw payment for damages from the public treasury.

4.1.9 Future Studies and Monitoring

- The City should initiate a more detailed study of pedestrian and cycling travel in the Kingston downtown waterfront, defined as the area between Macdonald Park in the west, Riverview Park in the east, and as far inland as Bagot Street. Pedestrian and cycling travel should be a “first principle” planning priority within this important area.
- The City should initiate a risk management and maintenance assessment of all key sidewalks, pathways and related public facilities. This assessment could include issues such as snow clearing, identifying potential trip hazards (i.e. differential settlement of pavement, streetscape obstructions), personal security and lighting, drainage, accessibility (i.e. ramps, intersection curb cuts), etc. This annual assessment will demonstrate that due diligence has been performed by the City in the case of negligence or claims against the City. (Refer to Appendix Four – *Managing Risk and Liability* in *Volume Two – Technical Appendices*.)

- The City should seek continued public participation and involvement for cycling and pedestrian facilities and programs. Surveys and counts are methods to monitor public opinion and satisfaction. A community-wide survey could be implemented that would explore and document public perception of pedestrian and cycling modes. Conclusions must be able to substantiate assumptions and follow-up with recommendations that are realistic. As a public relations exercise, this work would aim to promote wide spread acceptance of the *Kingston Transportation Master Plan* and the *Kingston Cycling and Pathways Study*.

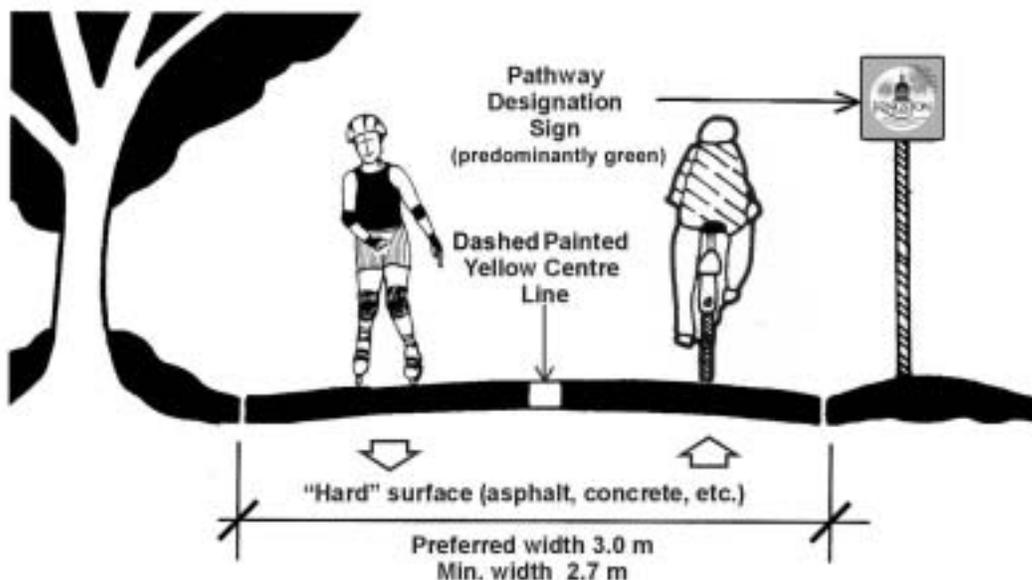
4.2 Potential Facility Network

4.2.1 Typical Forms of Recommended Facilities

The following descriptions and illustrations depict the various forms of linear facilities recommended for implementation in the Facility Network. Some facilities may involve minimal implementation requirements (such as painting a centre line on the existing pathway) or they may involve more detailed and costly implementation requirements (such as eventually widening an existing roadway to ensure adequate facility widths). The actual form of the proposed facility is most often determined by the specific conditions encountered along the alignment. It is important to note that designation is a constant and unifying element in each of the forms. For additional detail on recommended facilities see Section 4.4 Facility Design and Maintenance Guidelines.

- **Designated Multi-Use Pathway**

Multi-use pathways are for shared use by cyclists, pedestrians and in-line skaters, etc. These pathways are typically two-way facilities. They are designated with signage and possibly indicated on maps. Multi-use pathways are rarely located within the right-of-way of a roadway. These off-road pathways are physically separated from the travel portion of roadways by an open space or barrier. If by necessity short sections of multi-use pathways can bridge the gap between otherwise discontinuous facilities they are referred to as “boulevard pathways.”



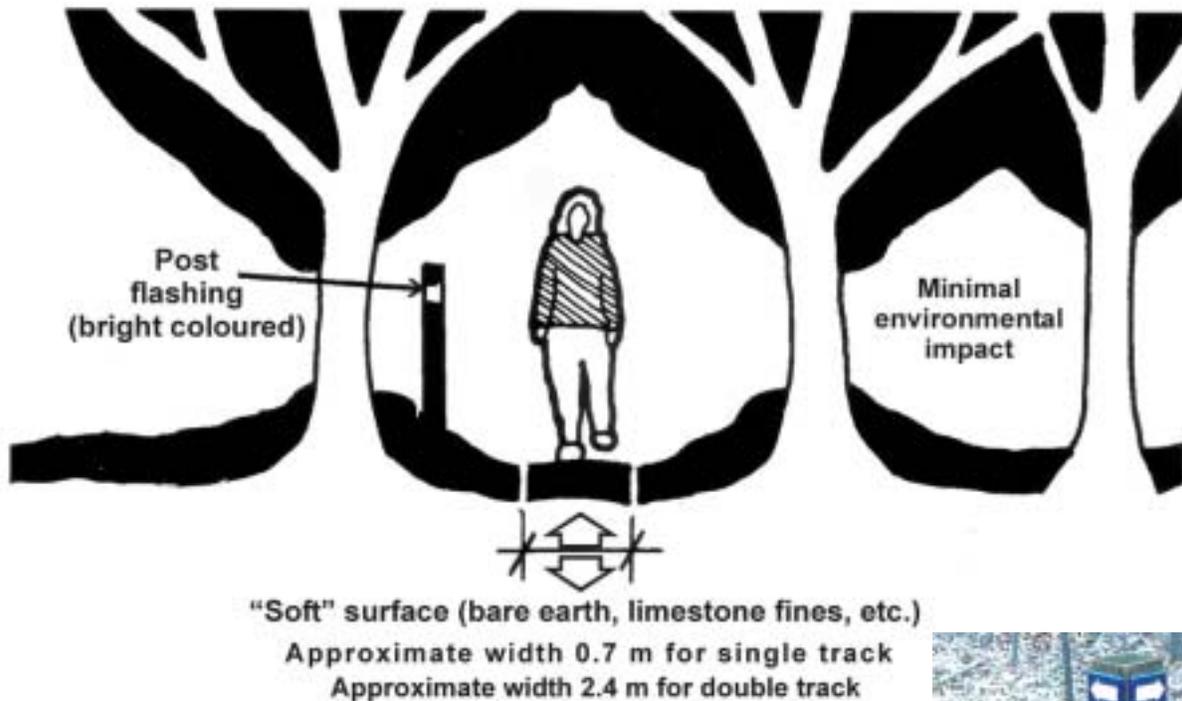
Designated Multi-Use Pathway

Figure 1

- **Designated Pedestrian Priority Pathway**

Pedestrian priority pathways are for shared use by pedestrians and cyclists, with the right-of-way priority intended for pedestrians. Pedestrian priority pathways are typically two-way facilities located in natural areas that are wooded, rocky and / or hilly. They could also be referred to as “single track” or hiking trails. Unlike multi-use pathways these pathways are narrower and not paved with asphalt (i.e. do not require a large paving machine to install). Therefore they can be introduced into natural areas with some environmental sensitivity. If a pathway surface (i.e. limestone fines) is provided, the material is conducive to storm water infiltration and plant root growth over time. Pedestrian priority pathways can be designated with path-side post or tree mounted flashings (small metal signs attached to tree trunks or posts) and possibly indicated on maps.

Because of their narrow width, it is necessary for one of the pathway users to yield the right-of-way to the other pathway user. Verbal communication and respect for other pathway users is required.



Designated Pedestrian Priority Pathway

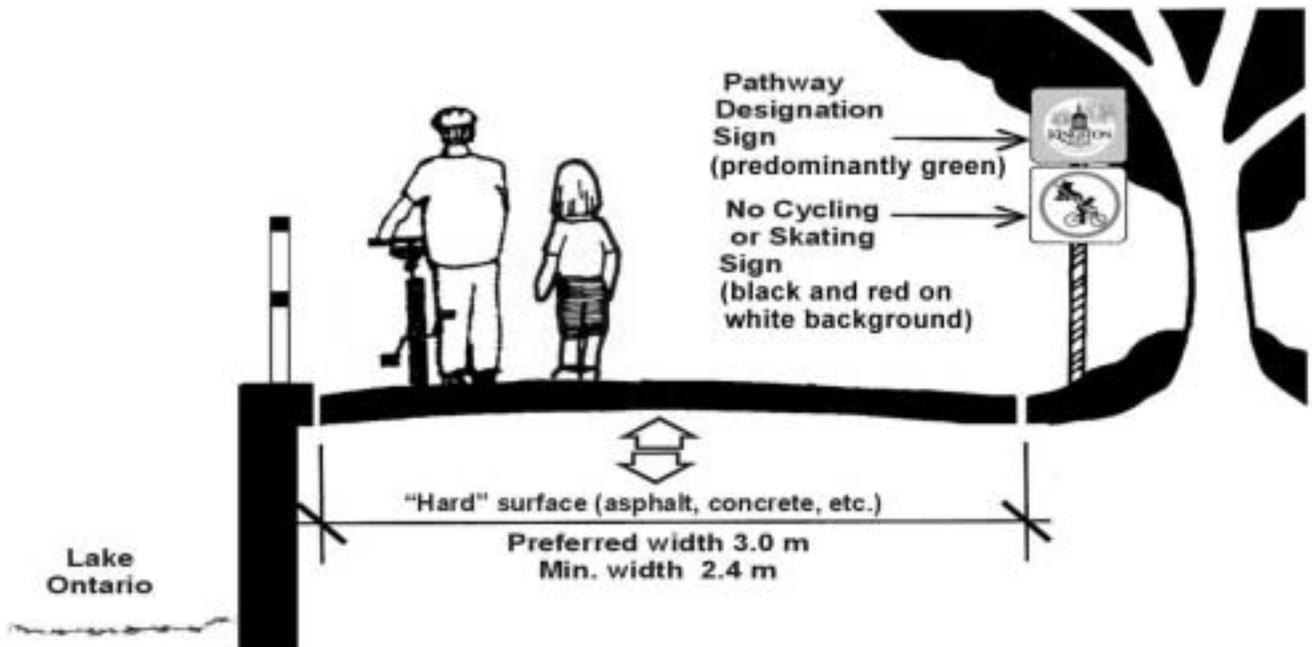
Figure 2



Example of Post Flashing

- **Designated Pedestrian-Only Pathway**

Pedestrian-only pathways are intended for the exclusive use of pedestrians. Signage is recommended to communicate the exclusion of riding cyclists and striding in-line skaters. These pathways are typically two-way facilities. They can be designated by path-side signage and possibly indicated on maps. Unlike sidewalks, pedestrian-only pathways are rarely located within the right-of-way of a roadway. Existing public right-of-way widths are often constrained by private land ownership, existing buildings and the waterfront edge. Consequently some existing pathways cannot realistically be upgraded to multi-use pathway facility standards. The tight scale and urban character of the downtown waterfront are often not conducive to the provision of facilities for riding cyclists and striding in-line skaters. These travel modes should be accommodated with parallel facilities.

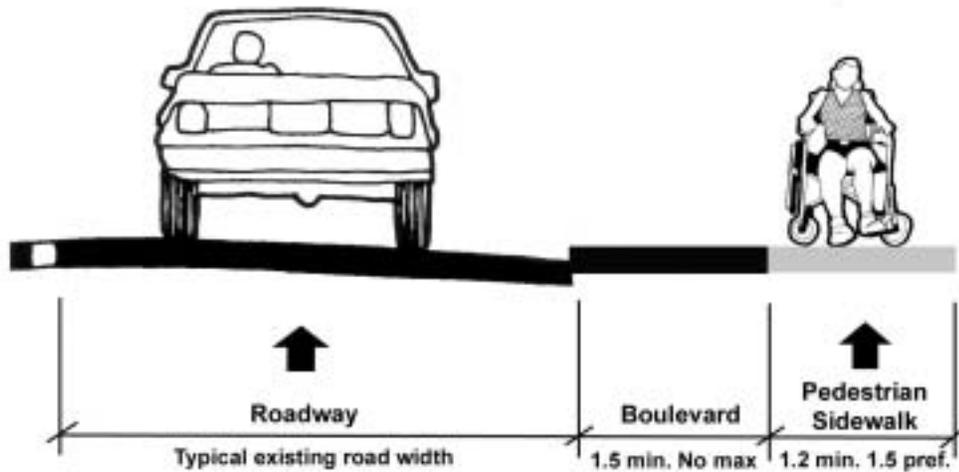


Designated Pedestrian-Only Pathway
Figure 3

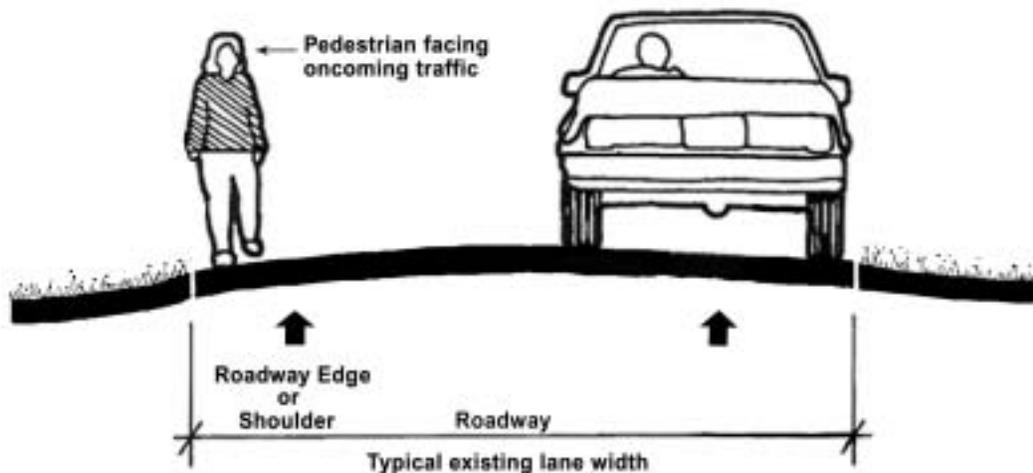
- **Sidewalks and Roadway Edges on Roadways Without Sidewalks**

Municipal sidewalks are intended for the shared use of pedestrians, in-line skaters and child cyclists. Where required, signage is recommended to communicate the exclusion of riding cyclists. Sidewalks are typically two-way facilities located on one or both sides of a roadway. Where sidewalks are located on only one side of a roadway, consideration should be given on how users will cross the roadway to access the sidewalk. Sidewalks can be designated by signage and possibly indicated on maps if they are part of a designated pedestrian route.

On uncurbed or unpaved (i.e. gravel) roadways, typically associated with rural areas or large parks, the provision of sidewalks is impractical. In these situations users will travel on the roadway edge or on the roadway shoulder. The *Highway Traffic Act* allows pedestrians to travel on the edge of a roadway without sidewalks if they travel on the left side of the roadway facing oncoming traffic.



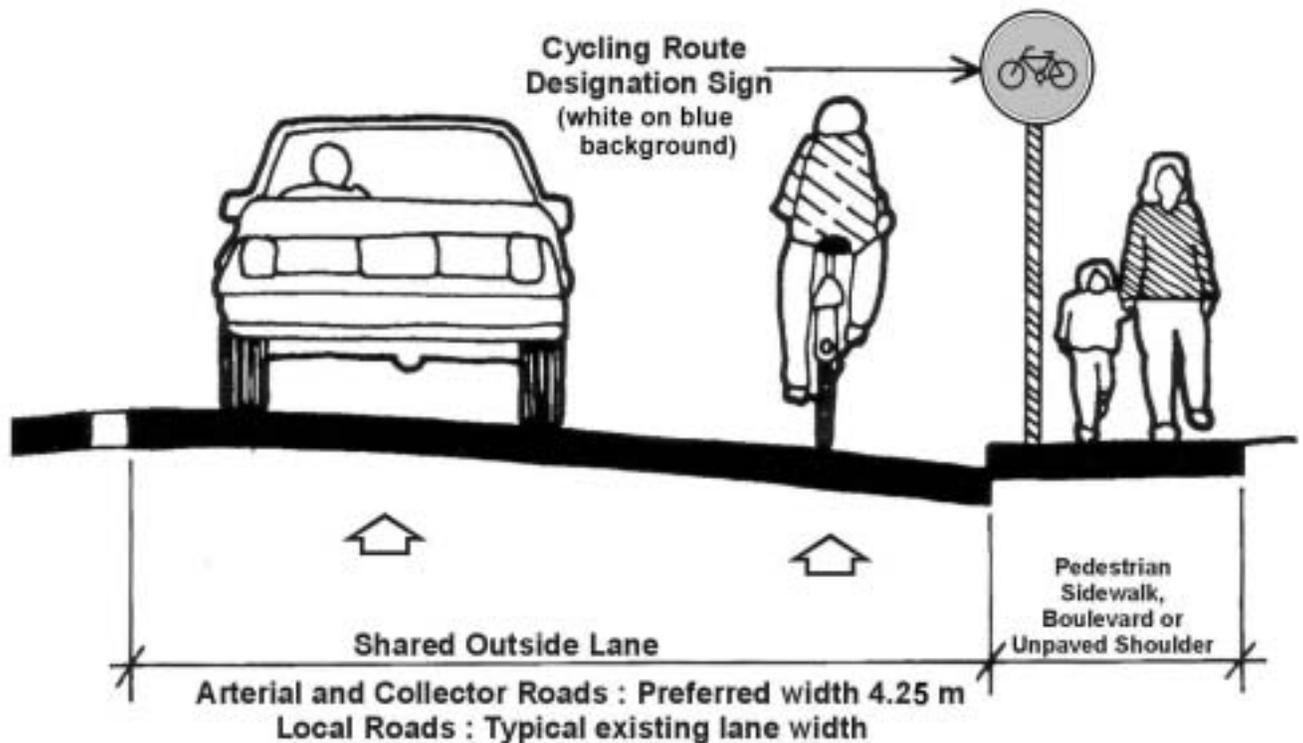
Sidewalk
Figure 4a



Roadway Edge
Figure 4b

- **Designated Shared-Use Cycling Route**

Designated cycling routes are the outside lanes of a roadway designated by roadside signage, optional painted pavement symbols, and possibly indicated on maps for focused shared use by cyclists and motorists. The signage and optional pavement symbols are used to remind motorists that cyclists are to be anticipated to share the lane with motor-vehicle traffic. This facility form requires cyclists to be fully integrated with motorists.

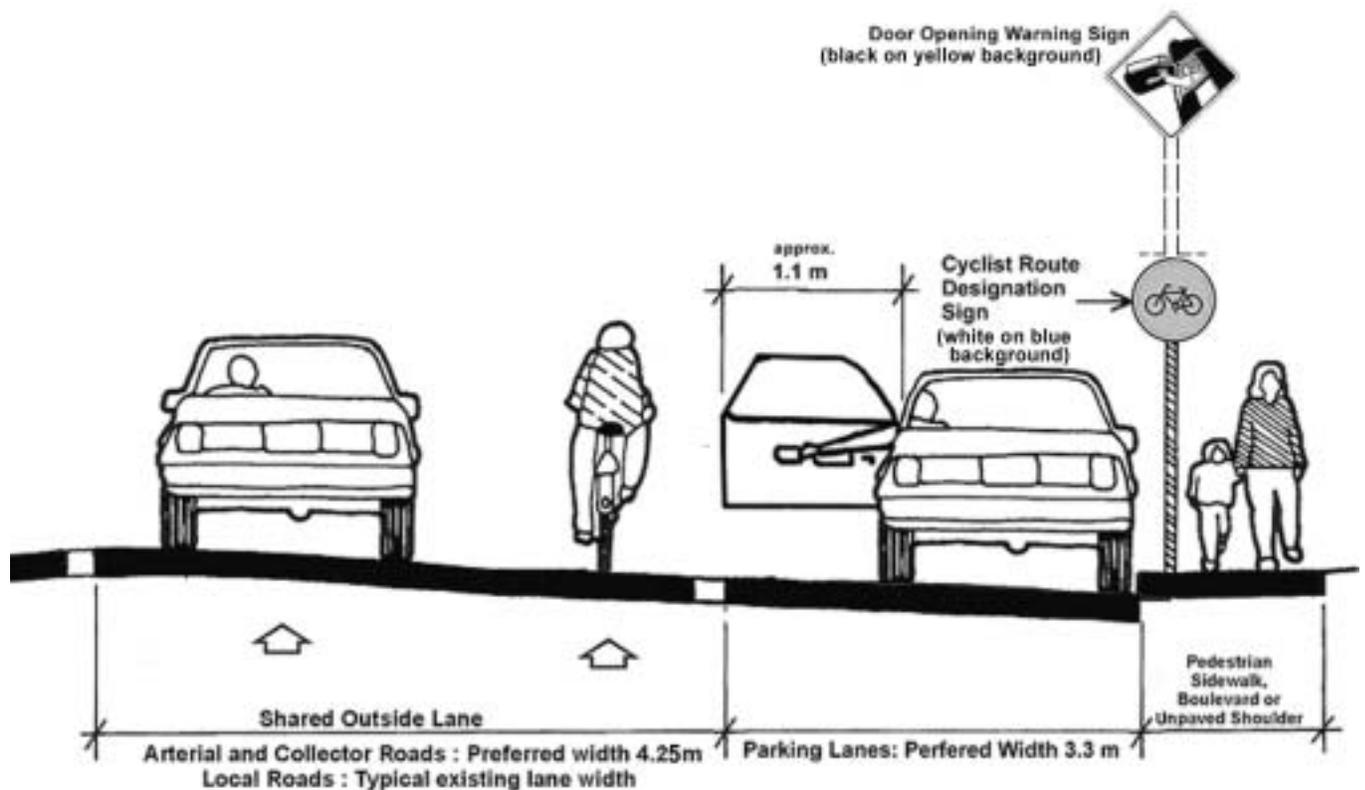


Designated Cycling Route

Figure 5

- **Designated Cycling Route with Parking**

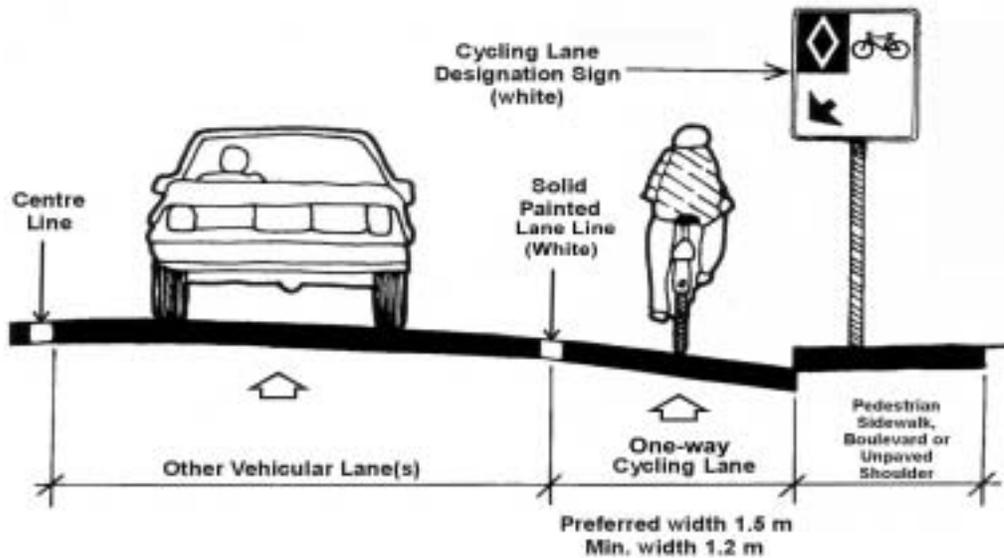
Roadways with on-road parking spaces can be made compatible with a designated cycling route if adequate space is available to accommodate the opening of automobile doors without interfering with cycling traffic. “Door Opening Warning” signs and an awareness program to prevent “dooring” are recommended. These signs would be spaced to alternate with “Cycling Route” designation signs.



Designated Cycling Route with Parking
Figure 6

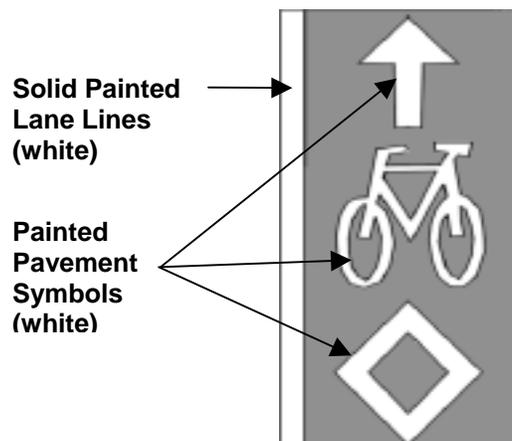
- **Designated Cycling Lanes**

Designated cycling lanes are the outside portions of a roadway that are designated by lane lines, roadside signage, painted pavement symbols and possibly indicated on maps for the exclusive use of cyclists. Cycling lanes are typically one-way facilities located on both sides of a two-way roadway. They are used to guide cyclists through difficult traffic situations or to establish a constant graphic reminder to motorists that cyclists are authorized users of that specific lane. Cyclists are integrated with motorists at intersections where cycling lanes are discontinued.



Designated Cycling Lanes

Figure 7a

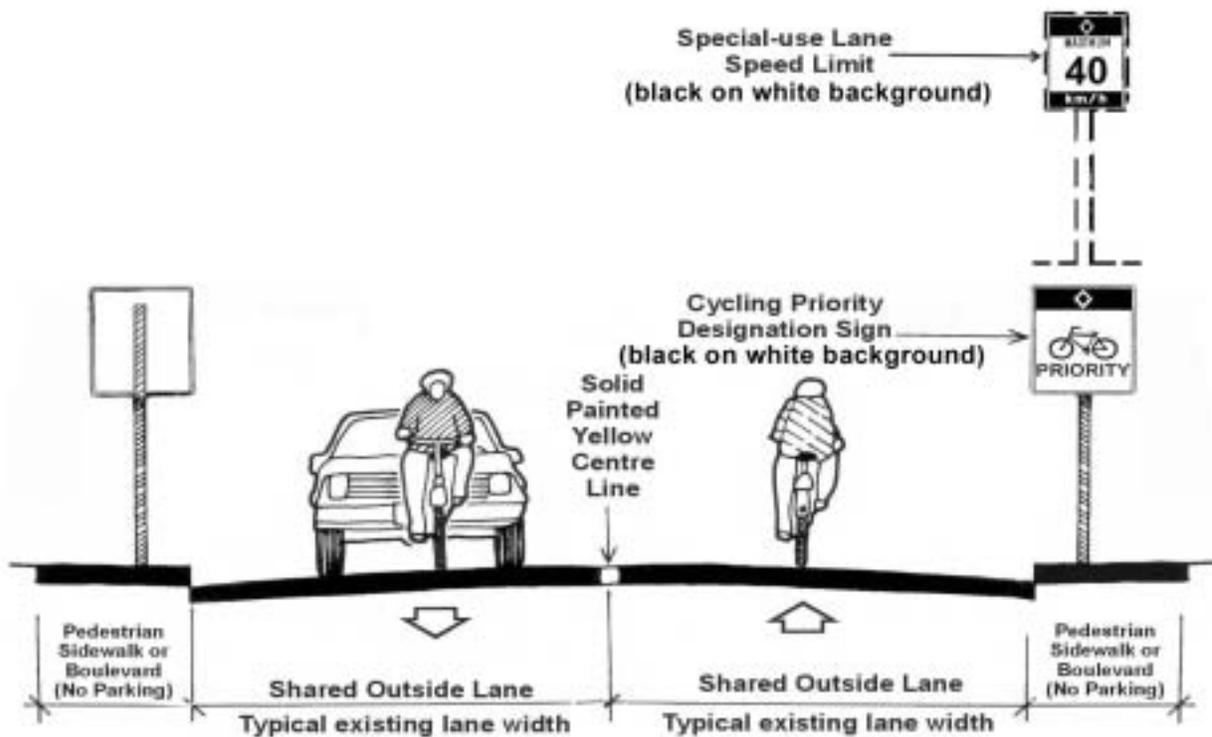


Cycling Lanes Pavement Markings

Figure 7b

- **Designated Cycling Priority Multi-Modal Road**

Designated cycling priority roads are the outside lanes of two-lane roadways or bridges that are designated by signage and possibly indicated on maps for first priority use by cyclists. Motorists and transit vehicles use this lane as second priority users. They are required to travel at reduced operating speeds (i.e. 40 km per hour maximum) within the lane. Cyclists have the right to use the full lane width. Vehicles wanting to overtake cyclists are required to change lanes in order to pass. Since existing public right-of-way widths are constrained by private land ownership, street trees, roadside utilities (i.e. hydro poles) and buildings or bridge structures, certain sections of roadway or bridges cannot realistically be upgraded or widened to an ideal standard. Designated Cycling Priority Roads are a compromise response to this reality.



Designated Cycling Priority Multi-Modal Road
Figure 8

4.2.2 Pedestrian Focus

When developing facilities it is important to consider the characteristics and preferences of all potential users. The following observations are based on those made by the Study consultants when preparing the *Waterfront Trail Design Guidelines* in 1994. Pedestrians can be divided into two general groups - leisure walkers and distance hikers. Differentiation is based on the motive and physical effort of their travel. For additional information see Appendix Nine - Excerpts from *Why Ontarians Walk, Why Ontarians Don't Walk More* in *Volume Two – Technical Appendices*.

Leisure Walkers

Leisure walkers represent a wide range of recreational interests with motives such as relaxation, socializing, exploring, contacting with nature, meditation, getting moderate exercise, or walking the dog. People of all ages, abilities and backgrounds pursue these activities. Generally, for leisure walkers:

- a typical stroll might involve an hour long outing (assuming a travel speed of 3 km/h)
- access to pathways by foot, car, public transit or bicycle
- would be concentrated in the urban area

The primary attraction in Kingston is the Lake Ontario waterfront and the public parks and natural lands along its shore. Leisure walkers typically access off-road pathways via urban streets on which they are considered responsible for their own decision-making and safety. When they arrive at a designated pathway, however, their expectations may change to a more carefree and relaxed mental state.

Planners must have regard for the needs of potential users that may be impatient, inattentive or have sensory, cognitive or ambulatory difficulties. Walking is a basic activity and a freedom that is enjoyed by most; therefore, facilities must be anticipated for all potential users. Planners and designers should also consider the needs of walkers with baby strollers or walking aids, carrying picnic baskets or other equipment, and walkers in pairs or in groups, such as a class of school children.

Distance Hikers

Generally it has been found that distance hikers display some of the following characteristics, namely:

- day trips between 5 and 30 kilometres in length
- may be more keenly interested in natural features
- may be more adept at map reading
- more self sufficient than leisure walkers
- may expect fewer amenities
- attracted to challenging terrain and rural areas

Urban multi-use pathways may not appeal to hikers in the same way as the rural Rideau Trail would, for example. However, hikers are often the elite of the recreational walking set and may challenge themselves to cover long distances and be willing to walk on sections of rural roadway shoulder considered less safe or less interesting by the majority of leisure walkers. Facility

planners should assume that there will be keen pedestrians walking in remote or highway environments, even though the frequency may be very low.

Runners and Joggers

Although the motive for runners and joggers is primarily exercise, they may share more in terms of profile characteristics with distance hikers than they do with leisure walkers. They are accomplishment oriented. Runners and joggers are interested in enjoying off-road pathways at a greater speed and over distances between 3 and 15 kilometres. They will often avoid a paved pathway and run on adjacent lawn or gravel to benefit from the cushioning effect of these softer surfaces.

4.2.3 Recreational Focus

Recreational Cyclists

The mechanical efficiency of bicycles allows people of all ages to significantly increase their recreational travel distance and experience much more countryside by cycling rather than walking. Generally, some of the characteristics of recreational cyclists include:

- day trips between 15 and 45 kilometres in urban areas and between 20 and 90 kilometres in rural areas
- access to recreational facilities by cycling, car or public transit
- typical trip is one to two and a half hours (assuming a travel speed of 18 km/h)

Recreational cyclists generally have the same travel motives as leisure walkers. Although moderate exercise is a benefit of cycling, the primary motive is often recreational. Utilitarian cyclists may also use off-road pathways, though people commuting to work or involved in intensive athletic training will generally be expected to travel on roadways. In fact, speed limits and warnings should be posted to discourage fast riding and aggressive behaviour on off-road pathways. Since recreational cyclists will, along with leisure walkers, be the primary users of off-road pathways, their preferences and abilities should be carefully considered.

Although cyclists have the right to access the extensive existing public roadway system, many inexperienced cyclists feel unsafe sharing the road with automobiles. Most do not have the desire or skill level to ride in traffic. Off-road pathways, shared with pedestrians, may offer recreational cyclists a more secure environment to enjoy the use of their bicycles.

Recreational cycling pursuits, such as cycling together as a family outing, tend to involve a casual, non-vehicular cycling approach. These pursuits can be accommodated on pathways where established traffic laws for roadways are not applicable. However, when cyclists use the public roadway they are considered vehicles by the law, and are expected to follow the same traffic laws as motorized vehicles. Dangerous misuse of roadways by inexperienced, intimidated or inconsiderate cyclists should be anticipated and addressed by an appropriate design approach. For example, most cyclists will stop at traffic lights and travel on the right side of the road; however, many will not come to a complete stop at stop signs, nor signal turns, nor be able to

merge through a single lane of traffic on an arterial road to make a left turn. In addition many cyclists will walk their bicycles up a 5 percent or steeper grade.

As with pedestrians, there is no licensing program that restricts the use of roadways by incompetent, inconsiderate or dangerous cyclists. Planners must consider that cyclists are people of all ages, abilities and experience.

Another factor affecting the recreational cyclist is the bicycle itself. Some bicycles, such as the popular, fat-tired mountain bike can travel effectively over soft screenings and gravel surfaces, whereas, traditional narrow-tired touring and city bicycles require well compacted granular surfaces or asphalt pavement. With a recreational focus, maximizing the speed and mechanical efficiency for bicycles on off-road pathways is not a primary concern. Most public roadways on the other hand are paved with asphalt, as are most park roads and urban parking lots. The ability of cyclists to negotiate the transition between an asphalt surface and a granular surface is a legitimate safety concern, especially in the case of a gravel shoulder parallel to the roadway. Many recreational cyclists still use narrow-tired bicycles that skid easily on granular surfaces.

In-Line Skaters

In-line skating has become very popular among all age groups, particularly in urban areas.

In some municipalities, in-line skaters and skateboarders have been prohibited from using either roadways or sidewalks by local by-laws. Consequently, they are avid users of hard-surface off-road pathways.

Although in-line skaters may have more in common with cyclists than pedestrians in terms of their travel motive and speed. However, the Ontario Ministry of Transportation does not consider their skates to be “vehicles”. Municipalities have responded on an individual basis to the question of where to allow in-line skaters to travel. Some municipalities specify that in-line skaters use sidewalks, others the roadways. No obvious solution has emerged and consequently no standards have been widely adopted.

In-line skaters (as well as skateboarders and roller skaters) require a very smooth surface. Loose sand, gravel, twigs, branches and puddles are significant hazards. In many cases in-line skaters' efficient operating space is in excess of a width of 2.3 metres. An inability to come quickly to a complete stop is a significant characteristic and drawback to this travel mode. In-line skaters view long or steep hills with limited visibility as either challenging or terrifying depending on their level of experience.

4.2.4 Utilitarian Cycling Focus

Utilitarian cyclists use their bicycles for purposes such as travelling to work or school, shopping, transporting goods, performing business, running errands, getting to social engagements, etc. Generally these cyclists will take the most direct way to their destination. Just as with motor vehicles, utilitarian cyclists currently use arterial roads for making the majority of long distance trips because they are direct and familiar. As the Kingston Facility Network is developed over

time, it is hoped that cyclists will increasingly use the designated on-road facilities that are identified on the Urban Area - Utilitarian Cycling Master Plan.

In terms of the typical distance commuter cyclists travel, the *Kingston Whig Standard*, February 12, 2003 reported the following:

TABLE NUMBER 2
City of Kingston Median Cycling Commuting Distance as Reported in 2001

Distance	% of Use
Less than 5 km	58.52 %
5 to 9.9 km	25.59 %
10 to 14.9 km	6.38 %
15 to 19.9 km	2.53 %
20 to 24.9 km	0.99 %
25 to 29.9 km	0.89 %
More than 30 km	5.06 %

Source: *Kingston Whig Standard*, February 12, 2003

The population of Kingston in 2001 according to Statistics Canada was 114,195. The total of all Kingston commuters was 46,000. 2.2 percent of the 2001 Kingston population represents 2,512 cycling commuters.

Bicycles used by the novice cyclist for commuting may be heavy, inefficient and in poor working order. The effectiveness of brakes for stopping and gearing systems for climbing hills and accelerating may be inadequate. This is an unfortunate handicap that often discourages some novices during their initial attempts at commuting by bicycle. It is a generalization, but as commuter cyclists gain experience, they may upgrade their bicycles and acquire special clothing and accessories to improve their personal comfort and travel efficiency. Fenders, racks and panniers (bicycle luggage), lighting systems and secure locks are typical acquisitions. For additional information see Appendix Eleven - *Deterrents to Cycling as a Mode of Transportation and Possible Sources of Improvement in Volume Two – Technical Appendices*.



Utilitarian Cyclists



4.3 Potential Support Programs

4.3.1 Cycling Education

In the City's desire to improve conditions for cycling, bicycle use training and education are strongly recommended. Educational programs can have a significant impact on reducing accidents and giving inexperienced cyclists the confidence they need to cycle on-road and cycle more often. Although the focus is initially on improving the skill and confidence of cyclists, it is recommended that other road users (i.e. motorists) are educated to travel cooperatively with cyclists. This can be accomplished through awareness and promotional programs such as the "Share the Road" program.

Bicycle use education is a topic that has received considerable attention by cycling experts. A Canada-wide program designed to educate all age groups has been developed by the Canadian Cycling Association (CCA), and is distributed through the Ontario Cycling Association. The CCA's *Can-Bike* Skills Courses are modern programs endorsing a vehicular cycling approach. Most of the courses are conducted on-bicycle, with some theoretical classroom lectures.

A benefit of a structured education program is that training accelerates the development of cycling skills. Whether it is tennis or typing, one learns any skill more quickly when taught by an expert rather than by trial and error.

Educational programs can be considered as the "instructions" for the comfortable and efficient use of public roadways and recreational paths. They should promote awareness of responsibilities and knowledge of traffic laws. They should teach road sense, conflict avoidance, route selection, basic bicycle maintenance and handling skills. Educational programs are encouraged because they are based on a preventative approach. These programs will be discussed separately for children and adults.

Cycling Education Programs for Children

Statistics show that most motor vehicle-bicycle collisions involve the age group between 11 and 16 years. The problem with promoting a vehicular approach to cycling is that children do not have motor vehicle driver's licenses and consequently, the concepts of manoeuvring in traffic are unfamiliar to them.

Most motor vehicular-bicycle accidents involving children occur as they enter the roadway from sidewalks, residential driveways or at parking lots. It is believed that factors such as their small size, feeling of immortality, disregard of the rules and unpredictable riding behaviour can occasionally get them into trouble.

Educational programs for children concentrate on the ages 9 to 13 (grades 4 to 8). Generally children 6 and under should ride on sidewalks near their home under adult supervision. Children between 7 and 8 can ride unsupervised but not on the road. Children 9 and over can, through proper training, begin to use quiet streets and understand how traffic works. Cycling gives them a taste of personal mobility and independence. They may have trouble judging vehicle speeds or

understanding concepts such as rights-of-way, but they can learn specific rules and develop a high physical level of bicycle handling skills.

Often, a decision must be made between implementing more expensive, in depth courses using well qualified, highly motivated instructors, or regular teachers who may have minimal cycling skills or interest in cycling and are already constrained by a tight schedule. Although a limited budget may dictate that training must reach a wide audience, there is no substitute for quality programs.

The CCA offers two courses for age groups 9 to 13:

- *Cycle Right* is a basic hands-on course with 6 hours of classroom instruction and 6 hours of on-bicycle training. It is taught by certified instructors and stresses the basics of looking, yielding and judging.
- *Smart Cycling* is a teacher-ready classroom course involving 12 lessons with video input and optional outdoor activities.

CCA qualified instructors are available in most parts of Ontario on an hourly charge basis, plus travel expenses. There are apparently five qualified Can-Bike instructors living in the Kingston area. Other costs are classroom space, audiovisual equipment, etc. The development of these courses was assisted by Fitness Canada, a component of the Government of Canada's Ministry of Fitness and Amateur Sport. The calibre and training of instructors are important factors.

Utilizing the talents and energy of older teenagers as cycling instructors may also be an effective way of reaching youngsters. They will be viewed as admired role models rather than figures of authority such as the police or a regular teacher. For example, teenagers have been used extensively as swimming instructors. Cycling courses run in the summer months in conjunction with day camps and other summer programs by a small number of trained teenage instructors should be encouraged. The City of Toronto runs day camps that include an optional *Cycle Right* course taught by university students that have passed the *Can Skills* Course.

The following are suggestions for successful education programs for children:

- Avoid programs that stress fear of cars and what not to do rather than what to do. Typically, they promote non-vehicular cycling techniques (the cycling-inferiority approach) such as hugging the curb regardless of the roughness of the road or gutters, riding slowly with the head locked robot-like straight ahead, using only the left arm to signal turns and generally relying on luck rather than skill to avoid accidents. Instead, focus on employing a vehicular approach to cycling.
- Comprehensive cycling education programs involve safety knowledge plus a considerable component of encouragement and fun. Incorporate cycling issues into other school subjects such as geography (i.e. travel), physics, environmental awareness and the physical education curriculum. Bring the cycling education approach out of the strictly safety realm and make the approach include more of a lifestyle issue. This is particularly

effective with teenagers who respond to informal education experiences such as fun races and bicycle tours into the countryside.

- Two basics of an effective program are practice by doing and correction by a skilled observer. Perfecting a manoeuvre in a controlled environment, such as a schoolyard, is advised before attempting it on a quiet street or ultimately in busy traffic.
- For the children who do not have access to a bicycle, it is advisable to have extra bicycles (such as the adjustable Dahon folding bicycle) available.
- Each age group should be given a specific set of skill objectives that build a foundation for the next year. Training should take place over an extended time frame so that there are opportunities for practice and review between lessons.
- Bicycle rodeos and bicycle safety inspections are other activities that complement education programs. For example on May 2, 2003, during the *Rolling on the Runway* event, families were invited to “ride anything with wheels...bike, skate, in-line skate, skateboard” at the Kingston Airport. The KFL & A Health Unit and the City sponsored this event.
- Children should be encouraged to make their own decisions. Many cycling accidents occur when they follow each other without looking or thinking (i.e. running stop signs). If they want to play games with their bicycles, they should be encouraged to stay away from roads and sidewalks.
- An added advantage of teaching children proper cycling skills is that they will be more considerate and aware of cyclists if and when they begin to drive a car.
- Reinforcement of efficient cycling must continue at home. Parents should ensure that their children's bicycles fit them correctly and are properly maintained. They should be responsible role models and follow all the rules when they are cycling with their children.

Cycling Education Programs for Adults

The cycling challenges confronting adults are different from those involving children. Most adults have motor vehicle driver's licenses but lack the confidence to operate a bicycle in the same way they operate an automobile. They may be inhibited by misconceptions about their physical ability or by social pressure. These cyclists are often too cautious of the dangers least likely to produce an accident. They will not merge with traffic because they are afraid of delaying motorists or "getting in the way". Reinforcing their rights to the road is of fundamental importance.

Educational programs for adults can involve more complex principles of traffic management. The North American roadway system is based on channelling traffic into laneways depending on speed and turning intentions. Complex intersections can be negotiated through an established hierarchy of merges and lane changes. Unlike European roadways that have fewer controlled, perpendicular intersections, the Canadian road system requires less skill and vigilance. However, no matter how sophisticated or logical our traffic system is, its comfort and efficiency are defeated when misused by confused or incompetent cyclists or motorists.

The rules of using the road effectively can be quite basic:

- Obey the Ontario *Highway Traffic Act*. It is law for all vehicles on the road whether they are motorists, recreational or utilitarian cyclists.
- Signal turns while using shoulder checks, rear view mirrors or both.
- Travel in a constant direction at a reasonable rate of speed.
- Ideally, cyclists should overtake on the left, but when traffic is stopped, it is practical to proceed cautiously on the right, realizing that the biggest blind spot of most motor vehicles is the right rear.
- Be patient, courteous and maintain a positive attitude.

The CCA offers three courses for adults, which feature small classes and nationally certified instructors.

- *Can-Bike Skills I* combines five to eight two-hour classroom sessions with videotapes and some on-bicycle instruction. It is directed at novice cyclists and includes basic maintenance and equipment selection sections. It is typically offered over a 5-week period.
- *Can-Bike Skills II* combines five three-hour classroom sessions, nine hours of on-bicycle instruction and a six-hour day that may include a cycle tour. It is intended for more experienced cyclists and teaches advanced traffic cycling skills, hazard avoidance skills, efficient cycling techniques for all types of weather and terrain, and group riding techniques. It is also held over a five-week period.
- *Cycling Freedom for Women* is similar in content and length to the *Can-Bike Skills I* course, but all instructors and participants are women and additional information specific to women is included.

Improving the proficiency of cyclists is also an objective of a successful bicycle use program for adults. Since the rider is the engine of a bicycle, any improvements to cardiovascular fitness and coordination will improve the efficiency of cycling. Improving physical performance from an average level to a sporting level is attainable by most people regardless of age. Cyclists should be taught how to use gears, adjust cadence, climb hills, cross railway tracks, carry baggage, as well as how to ride at night and in the rain. They should be taught the basics of bicycle maintenance including repairing a flat tire, cleaning a chain, adjusting brakes and derailleurs. The following are other suggestions:

- Adults will respond to instruction if it is incorporated with other cycling interests such as touring for fun or commuting efficiently to work. An opportunity to improve skills for recreational cyclists and commuters is suggested.

- Programs should be geared to the average cyclist rather than the established enthusiast, except in the case of an advanced course. They should be based on real life problems and situations. Experienced cyclists who communicate confidence and certainty to their pupils should teach inexperienced cyclists.
- The success of any program depends on it being readily available, enjoyable and respected. If participants are unwilling to comply with its teachings it will be considered a failure. Once cyclists see how easy it is to ride in traffic, they will be encouraged to do so. The more cyclists the public sees on the road riding correctly with respect and confidence, will foster respect and make it more likely they will be able to do the same.
- Adults don't want to appear foolish, yet they will often buy expensive equipment and clothing. They would be better to invest in lessons that will improve their comfort and skills.

Although course content and philosophy has been refined and standardized for CCA Courses etc., the implementation process remains a major obstacle. The challenge to acquire funding and successfully promote these programs is beyond the resources of a typical cycling or service club. The City must have funding and confidence in whatever programs it endorses in order to successfully market them to the Boards of Education, concerned parents and the community at large.

4.3.2 Promotion and Awareness

The objective of promotional activities is to highlight new travel and recreational opportunities that the Kingston Facility Network will create for current walkers, cyclists and in-line skaters. However, promoting the use of the facilities and fostering awareness of potential users is equally important.

This effort should be directed towards frequent pedestrians and cyclists, occasional pedestrians and cyclists, motorists, and in general to all taxpayers, to convince everyone that this is an extremely worthwhile activity, deserving support now and in the future. One of the programs that assist with this promotional effort is the “*Share the Road*” campaign directed at motorists in Toronto for example to “Share the Road” with cyclists.

Suggestions for Encouraging Walking and Cycling

The following is a list of ideas and examples with the goal of promoting cycling and walking in Kingston. The City should develop specific recommendations and priorities from this list.

- The Kingston, Frontenac, Lennox and Addington Health Unit (KFL & A) recently launched their *Walk On* program to encourage the community and City councillors to take part in various walks. The idea is to get people active at their own pace by joining neighbours and friends to walk in neighbourhoods throughout the City. There are group walks led by volunteer leaders. As well, maps for 2 km long, 30 minute long walking

routes have been created so walkers can follow them whenever they choose. The website address is www.healthunit.on.ca.

- Develop a series of in-city cycling or walking tours highlighting points of architectural, historic, environmental or scenic interest that would compliment the *Walk On* program. Consider charging a small fee to offset the cost of summer student guides or self-tour maps.
- Promote cycling and walking as activities that are progressive and socially respectable. Highlight the benefits of increased non-motorized travel. They include, but are not limited to, environmental, health fitness, convenience, spin-off businesses and money saving benefits.
- A well-designed, visible system of facilities, composed of co-ordinated elements, will silently self-promote awareness and appreciation of a newly implemented network. For example, a dynamic and high profile series of image, directional and regulatory signs will do much to raise the visibility, comfort and efficiency of both on-road cycling routes and off-road multi-use pathways.
- Wherever possible, create incentives for walking, in-line skating and cycling to work. These incentives could be in many forms. The City could offer employee related benefits to its own staff as an example to the private sector and other municipalities. The incentives could be considered a part of the general employee benefit package. The following are suggestions for workplaces:
 - Designate preferred parking locations for bicycles. Secure racks and overhead protection from weather are recommended.
 - Provide free-of-charge locker, changing and shower facilities.
 - Make "flex time" available so cyclists can avoid traffic rush hours.
 - Support the formation of an employee commuter cycling or walking club. Award a monthly prize, such as a gift certificate at a sports shop, for new or most consistent commuters.
 - Encourage incentives for non-motorized travel. In Switzerland, a chemical company cancelled plans to build a new car park by encouraging its employees to cycle to work. Anyone giving up his or her existing parking place was offered a new bicycle.
- Determine a "preferred standard" bicycle-parking device. Incorporate its use throughout the City especially along the cycling routes, and at public buildings. Make ordering information available to developers and individual landowners.
- Encourage bicycle-parking facilities at all major destinations, institutions and work places.
- Bicycle parking devices should become a standard requirement of site plan control.

- Close a road or a number of lanes on Sunday mornings throughout the summer and create a temporary, car-free recreation way. Moveable barricades and police may be necessary at difficult intersections, but otherwise the requirements would be minimal. This is currently done in Kingston on Ontario Street for special events.
- Support a participating organization in the subsidized sale of safety products such as helmets, lights, reflectors, rear view mirrors and warning bells. For example, the Ontario Medical Association (OMA), in conjunction with the Ministry of Transportation, Canadian Tire and Helmtech (a bicycle helmet manufacturer), launched the OMA Helmet Campaign. Ontario doctors distributed 11,000 vouchers for five dollars off the price of a particular bicycle helmet to the public.
- Develop a facilities maintenance program with community input. For example, organize a spring sweep program of roads, shoulders and pathways. Involve youth groups, service clubs, school groups, etc.
- Establish and advocate a telephone line that can receive complaints about vandalism, maintenance problems or minor accidents on pathways or cycling routes. The City has established this service, however, it is poorly advertised (both 546-0000 and customerservice@cityofkingston.ca). Ensure that designated cycling routes and pathways remain user friendly. Currently Kingston uses a similar system for potholes through the City's Customer Service Department.
- Support cycling, walking and running related events such as walkathons, dog walks, road races, duathalons and triathlons in the City and area.
- Develop a recreational cycling or running racing league or drop-in time trial facility on a circuit closed to traffic.
- Support activities such as the Police auction of unclaimed, found and stolen bicycles.
- Ensure that public libraries have current books and magazines on a wide variety of cycling, running and hiking activities, including John Forester's book *Effective Cycling*.
- Mass rides and walks have become very popular. They offer a comfort level because of the numbers of participants and a feeling of being part of an important event. They can be used to raise money for charities, or simply to promote physical activity. At the end of the event, offer refreshments, displays and activities.
 - The *Tour de L'iles de Montreal* is the world's largest of such cycling rides; it involves over 35,000 official riders, 40,000 roadside spectators, 2,500 volunteers and 150 police. It is 45 km long. The *Ride for Heart* is held in communities throughout Southern Ontario. It typically has 20 and 50 kilometre long routes for cyclists and in-line skaters. It raises money for the Heart and Stroke Foundation of Ontario. The *Run for the ROM*, in Toronto, involved multiple laps of an 11 km circuit in benefit of the Royal Ontario Museum.

Special Cycling Events

- Concentrate efforts on what is becoming a very high profile event in other communities and Kingston, the annual "Bike Week" (BW). Kingston celebrated BW with events on Sunday, June 1, through to Sunday, June 8, 2003. Bicycle tours, skills clinics, a commuter breakfast, time trials and races were featured. BW is a continent-wide celebration of cycling generally occurring in early June. It has been promoted in a number of cities and involved a variety of activities, many of which could be encouraged other times of the year as well. Some suggestions are as follows:
- On the mornings of BW, organize a mass ride through the downtown area on a predetermined route. Depending on turnout, it may be necessary to close the curb lane, but ideally participants would integrate with the regular traffic. Moveable barricades and police may be necessary at difficult intersections, but otherwise the requirements would be minimal.
- On the mornings of BW, co-sponsor commuter pancake breakfasts with restaurants or food companies.
- Unveil a preferred standard bicycle-parking device at a prominent downtown location, such as City Hall.
- Display children's bicycle art or poetry at an art gallery or other appropriate place.
- Support a bicycle art auction where local artists reuse bicycles as art pieces.
- Sponsor a bicycle race on the Thursday or Friday evening of BW or a duathlon on the weekend. "Criterium" races (multi-lap races typified by a pack of riders and aggressive sprint finishes) held on a few blocks of city streets and are exciting events for spectators to watch.
- For rainy noon hours, present an on-going slide show of cycle touring in exotic places.
- As an evening feature, show popular bicycle movies, such as *American Flyers*, *Bicycle Thief*, *Breaking Away* or *Peewee's Big Adventure*. Offer free admission to anyone with a bicycle helmet.
- Stage a commuter race between a pedestrian, a cyclist and a motorist.
- Promote a campaign in which current cycle commuters escort a fellow employee from their home to the workplace.
- Provide noon hour entertainment in the general area of bicycle displays and activities such as live bands, basketball unicyclists, comedy skits on cycle commuting, BMX demonstrations, cycling wear fashion shows, buskers and other street theatre.
- At all of the BW events, hand out a questionnaire asking the respondent for suggestions / opinions on facility development priorities, the best and worst commuter routes, their habits for cycling use and their general level of satisfaction or concern with the City's cycling facilities.

- Challenge other municipalities, businesses and institutions to participate in a bicycle rack installation or total employee commuter trips competition. Stage a "corporate challenge" style relay or obstacle race featuring celebrities or departmental teams. The City of Kingston is doing the "*Big Bike*" race in support of the Heart and Stroke Foundation.
- Offer local bicycle shops and cycling groups an opportunity to provide the public with introductory, free-of-charge bicycle maintenance workshops, make minor sizing adjustments and suggestions for upgrading equipment.
- Ask participants of BW to register for a prize draw for participating. Hold an awards presentation event on Friday at noon. Distribute prizes such as a bicycle or gift certificates. Acknowledge the winners and sponsors of various competitions and activities.
- Encourage the local media to cover cycling issues and events. Radio, newspaper and television features on BW are an important way of reaching non-cyclists.

4.3.3 Enforcement

It is in everyone's best interest that pedestrians, cyclists, in-line skaters and motorists understand and comply with the guidelines developed by authorities for the comfortable and effective use of the pathways and roadways. For cyclists on public roadways, regulations for operating a vehicle have been established in the Ontario *Highway Traffic Act*. For the users of off-road pathways, municipal by-laws and rules of common courtesy prevail. The City of Kingston, in its role as the planner, developer, administrator and manager of facilities and programs encouraging pathway use, has the responsibility of designing, advertising and enforcing rules of operation and encouraging partnerships.

These rules of operation must be logical, consistent and practical. If they are, they will be defensible and respected. Rules must be part of a comprehensive enforcement program that considers the interests of all users fairly. They should encourage awareness of other travel modes and a cooperative philosophy of sharing travel space.

The principal reason for enforcement is the reduction of incidents causing property damage, injuries and death. However, the basic strategy of an enforcement program is to achieve voluntary compliance with laws, as well as to identify and correct violators and repeat offenders.

In terms of on-road incidents, statistics from a variety of sources identify illegal and incompetent behaviour on the part of the cyclist as the cause of 50 percent of motor vehicle-bicycle accidents. The most dangerous cyclist violations happen to be the most undeniably obvious offenses and therefore easily ticketed:

- cycling on the sidewalk
- cycling the wrong way on a one-way street
- disobeying traffic control devices
- cycling at night without headlights or reflectors

Other frequent violations and suggestions are as follows:

- ticket motor vehicles parking illegally in cycling lanes, on sidewalks and blocking pathway entrances
- administer written and verbal warnings for less serious offences; issue citations for serious offences
- encourage an understanding and compliance with existing traffic laws. For example, it is difficult for most motorists to respond to hand signals by cyclists when they don't know what they mean.
- listen to cyclist, pedestrian and motorist complaints

For information purposes it is noted that the City of Kingston's Police Department has two downtown patrol officers year round to assist with the enforcement of pedestrian and cycling by-laws. They also have four police officers and four to six community volunteers on bicycles to patrol various areas.

Further, the City of Kingston *Traffic Offender Program* is a broad-based educational / enforcement tool. One of its objectives is to target aggressive cyclists and encourage them to participate in a review of the traffic laws applicable to cyclists by way of a reduced fine. As with other modules within the *Traffic Offender Program*, one of the objectives of this program is to have traffic offenders review common rules of the road, which helps to correct bad habits or incorrect assumptions that have developed over time.

With regard specifically to cyclists riding on sidewalks former City of Kingston By-Law No. 38 – 10 states:

“No person shall propel, push or draw any vehicle, sleigh, handcart or wheelbarrow, bicycle or tricycle, or any cart, wagon or carriage wheel, on any public sidewalk or boulevard of the City, except at the entrance gateway in crossing such sidewalk to pass through such gateway, nor shall such person suffer the same to remain thereon. Anyone who contravenes this section shall be fined in the amount of One Hundred (\$100.00) Dollars, though young children would not be fined.”

City of Kingston Bylaw 98-228 indicates a fine of \$100 for riding a bicycle on a sidewalk. Kingston Township Bylaw 36-81 indicates a fine of \$200 for riding a bicycle on a sidewalk.

Suggestions for Law Enforcement

- Central to the issue of law enforcement is securing basic respect for the rights and priorities of others. Occasionally incidents occur between users on pathways, sidewalks and roadways that highlight this lack of respect.

In some cases there is a perception that certain individuals have total disregard for rules and that they are incorrigible (i.e. road rage). It is the responsibility of law enforcement

to curtail these extreme individuals. However, for the majority of society a more reasonable and logical approach should be taken.

In most cases pedestrians, cyclists and motorists are most concerned about personal safety, status and travel efficiency. Everyone is equal in the eyes of the law whether the individual is strolling across a crosswalk or rushing to work in an expensive car. The purpose of the trip or the mode of travel has no bearing on the individual's basic right to respect from others. As a road user, even though cyclists may be travelling quietly, compactly and without creating pollution, they do not have a right to purposely inconvenience other roadway users. And motorists, even though they may be paying substantial insurance, interest and fuel costs, do not have a right to intimidate or endanger the lives of others.

The rules for operating cooperatively exist. It is the attitude that we have towards each other that must be improved.

- As the agency responsible for enforcement, the Police Department needs the support of civic, educational and judicial authorities, as well as the media, if it is to be effective in reducing violations. Any new program should be preceded by publicity.
- The most efficient approach seems to be selective enforcement. This type of program examines accidents and determines where and what violations occur most often. Efforts are targeted at accident locations in an attempt to prevent them before they happen. This approach must be on going because saturation patrols and short-term crusades usually fail to achieve lasting changes in the behaviour of violators.
- Enforcement and penalties should be both firm and fair. All by-laws should be written and posted publicly or advertised periodically.
- The punishment should be tailored to the offence. Parents are responsible for the actions and safety of their children. Written warnings sent home with young offenders depends on the co-operation of parents to be effective. Older violators may be offered the option of attending a "Responsible Cycling Seminar" in lieu of paying a fine or going to court.
- The City of Toronto has the following by-law in place with regard to cycling lanes:

“A motorist may ONLY enter a bicycle lane in order to enter or exit a private lane or driveway; to drop off and pick up disabled persons as defined in the Highway Traffic Act; or to make a right turn at a road intersecting a bicycle lane.”

A similar by-law in Kingston and strict enforcement of such a by-law is recommended.

- The City of Toronto, administered through the Police Department and Cycling Ambassadors, has a program called *S.P.A.C.E.* This stands for Safety, Prevention, Awareness, Courtesy and Education. The program is a brochure and outreach program that attempts to combine enforcement issues with other aspects of improving conditions for cyclists. If this type of program were adapted by the City of Kingston it could incorporate input from the existing *Traffic Offender Program*.

4.4 Facility Design and Maintenance Guidelines

The following guidelines recommend a range of possible design standards for on and off-road pedestrian and cycling facilities in Kingston. They are based on a number of sources including the 1990 *Canadian Institute of Planners Community Cycling Manual*, the 1996 *Ontario Ministry of Transportation Ontario Bikeways Planning and Design Guidelines*, the 1997 *Waterfront Regeneration Trust Waterfront Trail Design, Signage and Maintenance Guidelines* and the 1998 *Transportation Association of Canada Bikeway Traffic Control Guidelines for Canada*.

In some cases a number of alternative approaches are presented because a definitive recommendation is not appropriate. It is important not to adopt guidelines because they are simply commonplace or have been adopted elsewhere. To a certain extent the City of Kingston must decide what approach to guidelines it wants to take.

Nevertheless, the consistency with which facilities are implemented is an important objective. The minimum width of facilities, the method of signage and all other design aspects should be developed to the same standard.

Guidelines have been listed in approximate order of priority.

Index of Design Guidelines for Pathway and Cycling Facilities

- (.1) Environmental Consideration and Protection
- (.2) Flooding and Erosion
- (.3) Personal Security
- (.4) Accessibility for Pathway Users with Disabilities
- (.5) Adjacent Land Owner Privacy Issues
- (.6) Cyclist and In-line Skating Operating Space and Clearance Distances
- (.7) Horizontal Curvature and Cross Slope
- (.8) Grades
- (.9) Sight Distances
- (.10) Width Standards for Off-Road Pathways
- (.11) Width Standards for On-Road Cycling Facilities
- (.12) Signage
- (.13) Pavement Markings
- (.14) Travel Surfaces for Off-Road Pathways
- (.15) Travel Surfaces for On-Road Cycling Facilities
- (.16) Posted Speed Limits for Off-Road Pathways
- (.17) Stopping Distances for Recreational Cyclists
- (.18) Detector Loops for Traffic Signals
- (.19) Mid-Block Crossings
- (.20) At-Grade Roadway Crossings
- (.21) At-Grade Railway Crossings
- (.22) Bollards and Gates

- (.23) Fences and Other Barriers
- (.24) Grade-Separated Crossings
- (.25) Access to Bridges and Tunnels
- (.26) Bridges and Tunnels for Off-Road Pathways
- (.27) Staircases
- (.28) Median Refuges for Crossing Roadways
- (.29) Rest Facilities
- (.30) Lighting
- (.31) Bicycle Parking
- (.32) Pathway and Cycling Facility Travel Surface Maintenance
- (.33) Roadside and Pathside Edge Maintenance
- (.34) Signage and Pavement Marking Maintenance
- (.35) Maintenance of Auxiliary Facilities
- (.36) Winter Maintenance
- (.37) Sewer Grates and Other Utility Covers
- (.38) Curbs and Shoulders
- (.39) Delayed Green Traffic Signals
- (.40) Contra-Flow Cycling Lanes
- (.41) On-Road Parking for Motor Vehicles
- (.42) Roadway Turn Lanes

(.1) Environmental Consideration and Protection

The public is concerned about possible negative environmental impacts of human access and pathway development in “natural” areas. A number of concerns have been identified as a result of what is considered detrimental intrusion. These include the disruption of vegetation, the disturbance of wildlife, the loss of privacy for adjacent landowners, personal security concerns and remote location gatherings.

Human travel through natural areas, if planned appropriately, is minimally detrimental to some natural environments. There may be circumstances in which identified nesting locations or the presence of a rare species of flora requires that visitors be directed to other less sensitive locations. Environmental protection may be achieved by identifying the sensitive features and then carefully adjusting the alignment of pathways around the features. Recreational travel provides citizens with an opportunity to experience and appreciate first-hand an undeveloped environment. The pathway itself, whether it is composed of worn earth, compacted limestone fines, or asphalt, is for the most part the extent of the imposition. Construction of pathways, unlike highway construction (which occurs at a much larger scale and is much less flexible in terms of alignment routing, curvature and grades) can be woven sympathetically into the fabric of many types of natural landscapes.

The City, in providing high profile, quality pathways that are continuous and link significant destinations, will focus human impact where it can be best accommodated. This strategy will reduce the tendency for individuals to create new, potentially detrimental pathways elsewhere. For example the Cataraqui Region Conservation Authority (CRCA) has addressed the creation of

undesirable secondary pathways through a “comprehensive pathway management program” which involves signage and tree planting.

A buffer area of naturalized vegetation approximately 5.0 metres wide should be maintained between a pathway corridor and wetlands or other water bodies. A buffer area of mown grass is not recommended because often it contributes to bank erosion and the degradation of the subject environmentally sensitive area. In terms of construction practices within and adjacent to environmentally sensitive areas, the following guidelines are recommended:

- Create naturalized buffer strips between paths and natural areas or watercourses.
- Minimize disturbance to natural vegetation adjacent to the pathway and traveled right-of-way.
- Install sediment and erosion control measures around all disturbed areas prior to the commencement of construction. These measures are to remain in place until the area has stabilized.
- Maintain and improve local drainage in order to prevent ponding on and adjacent to pathways.
- Dogs should be kept on a leash when they are being walked through natural areas to avoid disturbing wildlife. As is the policy elsewhere in the City, “stoop and scoop” waste removal is required.
- It should be noted that the advice of a qualified environmental professional may be required when siting a pathway within or adjacent to an environmentally sensitive area. The Provincial Policy Statement intends that site alteration, such as grading and filling, not be permitted within a provincially significant wetland south and east of the Canadian Shield.

(.2) Flooding and Erosion

The City should, wherever possible, develop off-road pathways outside of areas that may be subject to 1:100 year flooding and/or erosion hazards. In the case of floodplains, the concern is partially for the well being of pathway users during flood events, but also for the need to remove sediment and debris from the pathway following a flood event. In the case of erosion hazards, the CRCA has observed that pathways along steep slopes may be undercut over time, resulting in the need for their relocation or stabilization. The CRCA suggests that a preventative approach be taken instead. Pathways with unpaved surfaces should be constructed across, rather than directly up slopes, in order to minimize the potential for surface rill and gully erosion.

The CRCA has a Fill, Construction and Alteration of Waterways Regulation that applies to the City. This regulation was made under Section 28 of the *Conservation Authorities Act*. A permit may be required for certain pathway projects. Where a pathway is proposed within a 1:100 year

floodplain, staff seek to ensure that the volume of the floodplain is not reduced and ensure that filling, culverts, bridges, etc. do not act as impediments to water flows.

(.3) Personal Security

Personal security refers to pathway users' security and feelings of security, typically as experienced by women, the elderly, children, and other vulnerable groups. The Safe City Committee and Planning Department of the City of Toronto have identified a number of factors that enhance security in any environment that are endorsed by this Study as follows:

- Visibility by others could include the following:
 - Have routes pass through well-used public areas.
 - Parking should be provided in highly visible areas.
 - Signs at entrances to routes through natural parks, industrial areas, or other isolated areas could indicate the area is isolated and suggest an alternative route.
- Visibility by users could include the following:
 - Underpasses and bridges should be designed so that users can see through to the opposite side into the surrounding area beyond. If underpasses and bridges cannot be avoided, alternative routes should be provided and signed as such.
 - Shrubs and trees should be pruned to maintain sightlines and ensure that lighting fixtures and signs are not obscured.
- Ability to find and obtain help. Signage that informs pathway users where they are and how to quickly escape. Provide "escape" routes from isolated areas to areas of high traffic or pedestrian activity. Routes should be signed so that pathway users can reach other people quickly. The City of Toronto suggests one such exit every 500 metres of pathway length.
- Security must be considered from the viewpoint of all users. Sight distances, for example, are to be considered from a cyclist, a pedestrian, an in-line skater and a wheelchair user's vantage point.
- Routes should be designed so as to avoid passing alongside breaks in building facades, stairwells, dense shrubs and other features that create hiding places. This aspect is particularly important at places where pathway users must slow down, such as at roadway crossings.
- Emergency call boxes and / or pay phones should be installed at trailheads and at remote or potentially dangerous off-road locations. Queen's University has installed these facilities on their campus.

For a discussion on lighting issues see Guideline (.30) - Lighting.

(.4) Accessibility for Pathway Users with Disabilities



Not all pathway facilities are easily adaptable to a level of accessibility that will accommodate all persons with disabilities. When attempting to make facilities accessible, the goal is to make facilities accessible for persons in wheelchairs and motorized scooters. If a pathway can achieve conditions suitable for wheelchair travel, it can generally accommodate a wide range of users with physical disabilities, seniors and persons pushing strollers.

Though it is certainly desirable to make all of Kingston's facilities as accessible as possible, some portions are more easily adapted than others. Hard surfaced multi-use pathways and pedestrian-only pathways are most easily adaptable, while hiking paths typically provide a natural, more rugged experience and are harder to adapt.

As a general rule, the level of accessibility increases as one moves closer to the downtown. The following are some general guidelines that can be applied to pedestrian priority pathways and multi-use pathways to bring them to a level of accessibility suitable for use by persons in wheelchairs or motorized scooters.

For further information pertaining to making facilities accessible to people with a variety of physical disabilities refer to the *Accessibility for Disabled Users of the Waterfront Trail: a Checklist*, 1996. Additional detailed information can also be found in the *Ontario Building Code - Exterior Ramps, 1997* and *Ontarians with Disabilities Act, 2001*.

(.4.1) Grade

Pathway grades should generally be under 5 percent, with the ideal situation providing for grades no greater than 3 percent. Entrances to facilities should have a smooth transition in grade. A grade up to 8 percent is acceptable but only for short distances, preferably less than 9 metres in length. Long climbs at slopes between 5 percent and 8 percent should be broken up with level landing areas, measuring at least 1.5 m in length, providing the opportunity for the user to stop and rest. Slopes greater than 5 percent are considered ramps and should be provided with handrails modified for persons using a wheelchair. The grade across pathways is recommended to be a maximum of 2 percent.

(.4.2) Width

Optimally, accessible pathways should measure 1.5 metres wide, and should never measure less than 0.92 metres. Paths measuring less than 1.5 metres across should be widened to 1.5 metres at least every 60 metres to enable passing. Generally, a 1.85 metre width is required for two-way traffic.

(.4.3) Travel Surface

The pathway travel surface treatment should be firm, smooth, stable and slip-resistant. Concrete and asphalt paving is ideal although wooden boardwalks are also acceptable. Elevation changes along accessible pathways (caused by changes in materials, the warping of wooden boards, curb cuts, etc.) should measure no more than 13 mm and are best avoided altogether. Similarly, gaps in the surface of the path, such as the spaces between wooden decking and the holes found in metal grates, should never measure more than 13 mm across and these gaps should be arranged to run perpendicularly to the movement of traffic along the path. The surface of all travel areas

(e.g. walks, ramps, stairs, boardwalks, rest areas) should be well drained and free of water trapping depressions.

Sidewalks and curb cuts at crosswalks should be designed to standards recommended by the Canadian National Institute for the Blind in consideration of persons who are visually challenged.

(.4.4) Pathway Edges

A minimum 50 mm high curb, a protective wall or a railing should protect pathway edges with adjacent drop-offs.

(.4.5) Amenities

Accessible pathways should connect all accessible amenities. For instance, accessible parking should be linked to an accessible portion of the pathway at the closest possible location. Picnic areas should be located no further than 60 metres from accessible parking and should be equipped with a number of picnic tables suitable for persons using a wheelchair, an accessible source of drinking water and accessible washrooms.

Other amenities that should also be linked include play areas, garbage receptacles, bridges and boardwalks, telephones and seating areas.

(.4.6) Signage

Pathway signage should be able to be easily read by persons in wheelchairs. For details on signage lettering size, colour differentiation, etc., in consideration of persons with sight disabilities consult standards recommended by the Canadian National Institute for the Blind. Special way finding aids such as tactile maps should be considered in high-profile locations.

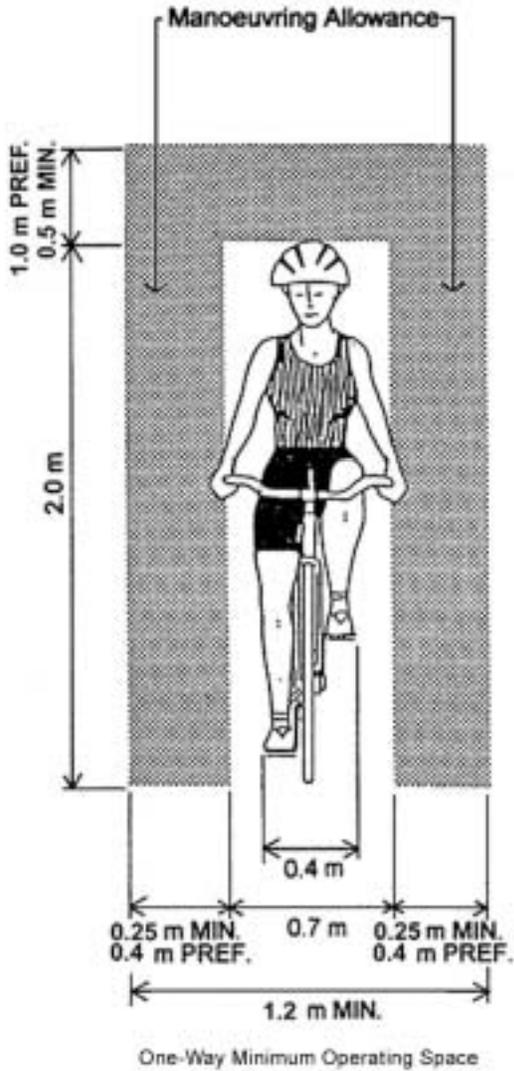
(.5) Adjacent Land Owner Privacy Issues

The development of off-road pathways often involves bringing the public into and through areas that were not previously used. These areas may be publicly owned parkland or open space where citizens already have the right to access. Pathways may be developed on “walkway” rights-of-way where informal public access has occurred for years but no facilities exist. Pathways may be developed on lands where public access has been newly provided for through a lease, or other form of agreement, with private landowners. In all cases the privacy of adjacent landowners should be protected as much as possible.

To accomplish this objective, adjacent land uses, security issues and view planes need to be determined and analysed. It will be necessary for the City to consult with adjacent landowners to identify their concerns. To screen views and minimize the potential for trespassing, the need to include new fencing and/or plant material (trees and shrubs) should be determined by the City facility designer. The extent and quantity of these screens may need to be negotiated with the individual landowner.

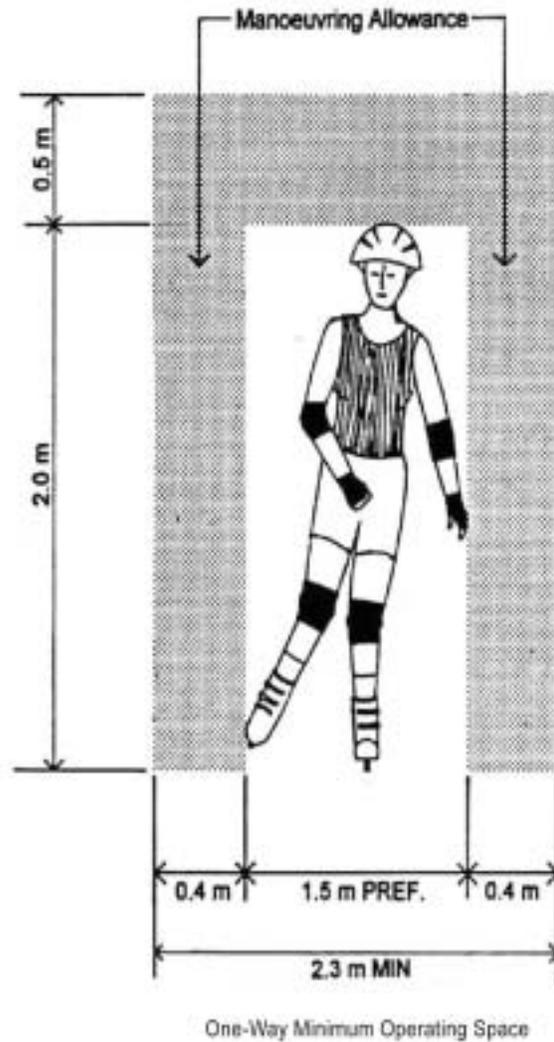
The City should not tolerate encroachments by adjacent landowners onto publicly owned land. Encroachments such as private gardens and private storage facilities should be removed. Lockable access gates and views into the pathway open space from adjacent properties should be encouraged to increase access and surveillance of pathways.

(.6) Cyclist and In-line Skating Operating Space and Clearance Distances



Cycling Operating Space Distances

Figure 9



In-line Skating Operating Space Distances

Figure 10

The minimum recommended operating space allowance for a cyclist on a bicycle is 0.7 metres, which is based on the handlebar width of a typical mountain bike. To allow for the natural movement of a cyclist and avoidance of roadway surface hazards a 0.25 metre manoeuvring allowance on either side of the operating space is recommended. This translates to a minimum recommended one-directional cycling lane width of 1.2 metres for low speed, low traffic volume roadways. If the roadway has a barrier curb, a 0.3 metre clearance distance is recommended, which translates to a minimum cycling lane width of 1.5 metres.

Two cyclists, passing each other in opposite directions, benefit from a shared central manoeuvring allowance of 0.5 metres. Therefore, the minimum recommended width for a two-way off-road multi-use pathway is 2.4 metres. For hard surfaced pathways the minimum recommended width is 2.7 metres. The preferred width is 3.0 metres.

In-line skating requires a functional operating space of 1.5 metres, with 0.4 metre manoeuvring allowances on either side, totaling 2.3 metres for one-way travel.

The presence of vertical obstacles such as barrier curbs, walls, poles or railings immediately adjacent to a cycling facility require that a minimum horizontal clearance distance of 0.3 metres be maintained. The preferred horizontal clearance distance is 0.5 metres.

The minimum recommended vertical clearance height is 2.5 metres with the preferred vertical clearance height of 3.0 metres.

(.7) Horizontal Curvature and Cross Slope

On-road cycling routes, which use the roadway, will have the same horizontal roadway curvature and cross slope as the roadway. Since roadway curvatures and turns are designed to accommodate motor vehicles, they will be more than sufficient for cyclists. Note, however, that cyclists typically use the right edge of the roadway where the super-elevation of a roadway is most pronounced.

A pathway should be designed with a minimum 2 percent cross slope for stormwater runoff and slanted towards the inside on a curve for greater cornering efficiency. Where paths are on a hillside, an upper slope drainage ditch may be needed. Runoff debris would otherwise be deposited on the pathway, which could lead to loss of traction.

The American Association of Highway State and Transportation Officials (AASHTO) *A Guide for the Development of Bicycle Facilities*, which we recommend be generally used, provides full details on minimum turning radii for paved shared use paths. For general use, a 10.5 metre inside radius is the recommended minimum.

(.8) Grades

Grades are important because cyclists are more sensitive to the effects of gravity than motor vehicles. Acceptable grades for cycling depend on a variety of conditions such as the characteristics of the cyclist, the total bicycle weight, the travel surface, wind speed, and length of slope.

Grades greater than 5 percent are undesirable because the ascents are difficult for many cyclists to climb and the descents cause some cyclists to exceed the speeds at which they are comfortable. Where the terrain dictates, uphill grades over 5 percent and less than 150 metres long are acceptable when additional roadway or pathway width can be provided.



Waterfront Trail, Toronto

(.9) Sight Distances

Generally, attaining adequate stopping sight distances (being able to see hazards or objects in enough time to stop) on cycling facilities that share the roadway will not be a problem because the roadway has been designed to accommodate motor vehicle speeds equal to or greater than cycling speeds. However, with off-road multi-use pathways, stopping sight distances must be checked. The AASHTO *Guide for the Development of Bicycle Facilities* provides full details on stopping sight distance requirements.

It is recommended that sight distances be increased at and approaching intersections. Test the conditions with a cyclist riding at a speed of up to 40 km per hour. Reduce adverse impact on visibility for cyclists by removing vegetation, fences, signs, parked vehicles, etc., within sight lines; this is particularly important for off-road cycling routes with significant curves and rolling grades.

(.10) Width Standards for Off-Road Pathways

The following chart identifies the recommended minimum and preferred width in metres for off-road multi-use pathways.

	Minimum width <500 users/day	Preferred Width <500 users/day	Minimum Width > 500 users/day
Two-way multi-use pathway	2.7 m	3.0 to 3.5 m	4.0 to 4.5 m

In some situations because of especially high use, or the apparent need for both a multi-use facility and a pedestrian-only facility, it may be necessary to establish twin pathways. This alternative is only feasible where a wide, open space right-of-way is available.



Pathway Twinning, Toronto

(.11) Width Standards for On-Road Cycling Facilities

The following chart identifies the recommended minimum and preferred widths in metres for on-road cycling facilities.

TABLE NUMBER 3

“Forecast Year” AADT per lane	Recommended Facility	Minimum Width in metres
1. 1,000 to 2,000	Shared-use curb lane	4.3
2. 2,000 to 3,000	Shared-use curb lane	4.6
3. less than 3,000	Exclusive-use cycling lane	1.5
4. 3,000 to 10,000	Shared-use curb lane or Exclusive-use cycling lanes	4.9 1.8
5. greater than 10,000	Exclusive-use cycling lanes	1.8 + 0.5 offset zone

Notes: Conditions and Assumptions of Recommendations

- Forecast year to be 10 years beyond the year of implementation.
- All roadways assumed to have barrier curbs. For roads without barrier curbs subtract 0.3 metres.
- “Roadway” speed less than 75 km/h.
- Less than 6 percent truck traffic.
- AADT = Annual Average Daily Traffic.

Source: MTO Ontario, *Bikeway Planning and Design Guidelines, 1996*.

(.12) Signage

The best way to manage risk is to eliminate hazards. If the hazard cannot be eliminated, its presence must be communicated to users of the facility through the use of appropriate warning signs.

On-road cyclists are governed by standard regulatory, warning and information signage intended for all vehicular traffic. The MTO *Manual of Uniform Traffic Control Devices (MUTCD)* specifies these signs. Additional signage developed specifically for cycling facilities should not contradict or detract from standard roadway signage.

There are a number of official signs relating to on-road cycling facilities and roadway crossings. They are as follows, with the MUTCD reference numbers shown where possible.

- Cycling route (international blue on white sign)
- Cycling lane (Rb-84)
- Pedestrian and/or Cyclist prohibition (Rb-66, 67, 68)
- Cyclist exempt tab (similar to Rb-10)
- School crossing (Wc-1)
- Pedestrian crossover (Ra-4)

It is recommended that signage developed specifically for cycling facilities should be derived from standard roadway vocabulary in order to maintain the consistency and to minimize excess text. Standard roadway signage types can, in most cases, be modified or adapted to communicate information to cyclists with only slight changes in layout or text.

To be effective, signage should attract the attention of fast moving cyclists as well as casual cyclists and pedestrian traveling at lower speeds. To communicate to all speeds of cyclists, signage should provide simple, easy to understand messages, which are visible and legible from a distance, without being oversized or visually obtrusive.

It is important to ensure that all signage and its installation comply with the requirements of all governmental jurisdictions. If a highway is to be crossed for example, the Ontario Ministry of Transportation has specific requirements, which include the posting of standard crossing signs.

Off-road pathways require their own stand-alone regulatory, warning and information signage. Most signs are based on standards found in the *Manual of Uniform Traffic Control Devices (MUTCD)*. The following is a list of signs that should be considered for off-road facilities:

- Regulatory Signs:
 - Stop, Yield (Ra-1)
 - Pedestrian and / or Cyclist prohibition (Rb - 66, 67, 68)
 - “Cyclist dismount and use pedestrian crosswalk”
 - Speed control tab (i.e. 20 km/h)
 - One-way (Rb-21), Do not enter (Rb-19)
 - Parking prohibition (Rb-51)
 - Motor vehicles prohibited (similar to Rb-62)

- Warning Signs:
 - "Bicycle Crossing", Pathway crossing (Wc-14)
 - Stop ahead (Wb-1), Railroad crossing ahead (Wc-4), Steep hill ahead (Wa-21)
 - Sharp curve (Wa-1,2), Intersection ahead (Wa-11)
 - Roadway / Pathway narrows (Wa-28)
 - Bump ahead (Wa-22), Low clearance, other hazard markers
 - Truck entrance (Wc-8)
 - Door opening warning

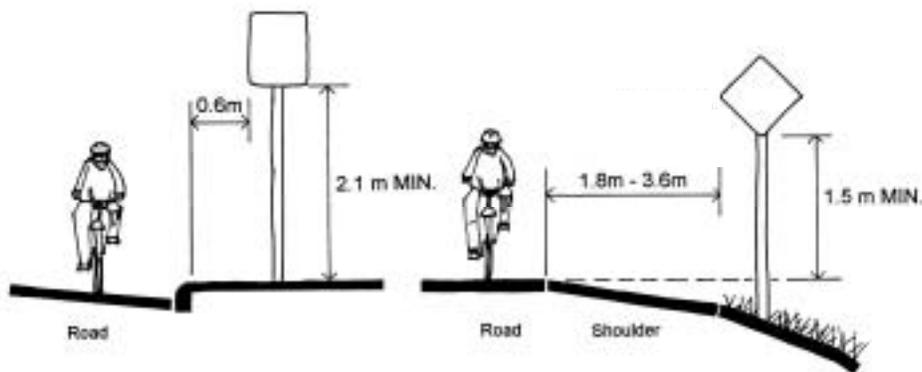
- Information Signs:
 - Designation (i.e. "City of Kingston Multi-Use Pathway", “City of Kingston Pedestrian Route”)
 - Direction arrow tabs – right turn, left turn, continue straight
 - "Keep to the right, Pass on the left".
 - Location Information (i.e. "Lemoine Point Conservation Area 2 km")
 - Identification of municipal borders and major cross-street names.

Information signage includes designation and directional signs and to a lesser extent, notice of upcoming services or attractions. Possible services or attractions to be signed are as follows:

- emergency telephone or call box
- drinking water or washrooms
- kilometre signposts
- parking lot (motor vehicle and bicycle parking)
- recreational facilities

Interpretative signage should not be placed within the road right-of-way but rather off-road where it can be read.

Sign Mounting Heights and Setbacks

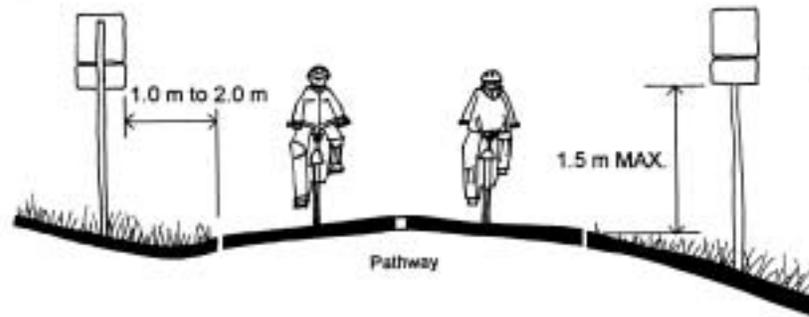


On-road Cycling Facilities
Figure 11

It is recommended that on-road cycling facilities be designated with blue on a white background "Cycling Route" regulatory signs developed internationally and used by the City of Toronto. These signs would be installed on straight portions of the cycling route, at regular intervals. Designation signs would also function as directional guidance signage with the addition of an "arrow" sign tab indicating change in cycling route direction in advance of a turn.

On-road cycling routes would use existing roadway regulatory, warning and information signage; however, it may be necessary to add signage specific to meet the needs and concerns of cyclists.

On-road "Cycling Route" and "Cycling Lane" signs should be posted at the beginning of blocks, at an interval of approximately 500 to 700 metres and at all significant points of access.



Off-road Pathways
Figure 12

It is important to keep in mind that the designation of cycling and pedestrian facilities is a relatively new and evolving field of endeavour. Many of the recommended signage applications presented here may be without precedent in Kingston. It may be necessary to apply for and obtain approval for these concepts from the MTO or to the Federal Government for the Causeway before proceeding to an implementation stage. It may also be necessary to develop municipal by-laws to formally establish these signs.

It is also recommended that tamperproof mounting hardware be used to minimize the vandalism of signage.



Ontario Street Sidewalk



Cycling Lanes, Toronto

(.13) Pavement Markings

On-road cycling lanes are separated from other travel lanes by a painted line or reflective tape. Lines should be painted or taped the same white colour as other roadway lane lines. Paint should be to Ontario Provincial Standards and Specifications (OPSS) and may include glass beads, which increases the reflectivity and surface roughness. They should be solid and 0.1 metres wide. A solid line does not indicate that cyclists are restricted to this lane. Cyclists are free to travel in other lanes as well. Cycling lane lines, as well as the recommended bicycle symbol and diamond-shaped, special-use lane symbol painted directly on the roadway surface, all reinforce the exclusive right of use of a cycling lane by cyclists. Cycling lane lines should be 1.0 m long and broken with 1.0 m spaces 20 metres before an intersection so that cyclists and motorists can merge before turning. Cyclist lanes should also be dashed at bus stops or turning lanes. Cycling lanes should not be continued through an intersection.

As with other lane lines it will be necessary to create cycling lanes under appropriate conditions such as over narrow bridges or in advance of a pedestrian crosswalk.

Using a different paving material, such as concrete or coloured asphalt, to demark a cycling lane is not recommended. Besides being costly, there is an ongoing problem of maintaining two different materials at a flush grade with one another. Painting the entire cycling lane is not recommended because painted surfaces can become slippery when wet and consistency and coverage would be difficult and costly to maintain.

Concrete curbs, bollards, rumble strips, and raised lane marks are examples of physical barriers used, in Europe for example, to separate cycling lanes from other travel lanes. They are not recommended in Canadian cities with different road and cycling realities. A continuous physical barrier restricts the entrance and exit of the cycling lane to intersections. Bollards would be a collision hazard for both passing cyclists and motorists. Rumble strips and raised lane marks, while acceptable for most motor vehicles, can be dangerous for both bicycles and motorcycles.

The OPSS recommends water borne traffic paint, which is the most common pavement-marking product. Generally it must be repainted annually because of the effects of tire wear, cold climate, road sanding and snow removal. Vinyl stripes are pre-cut lane markings glued to the travel surface, which have some advantage over paint. To extend their life span they should be applied to new asphalt into which they become embedded. A benefit of vinyl stripes is that on lanes with volumes of 3,000 vehicles per day vinyl stripes can last 3 to 4 years. They are also removable. Thermoplastic paint is hot-rolled onto the travel surface. Its visibility and life span are superior to alternatives. Thermoplastic paint is the most costly alternative but its removal destroys the pavement surface.



Cycling Lane Pavement Markings, Toronto

(.14) Travel Surfaces for Off-Road Pathways

Compacted stone fines may be used for typical shared-use recreational paths with less than 500 users per day. This surfacing is less expensive and more environmentally friendly than alternatives, but requires periodic maintenance. Asphalt is generally recommended for pathways intended for utilitarian cycling or with more than 500 users per day. Poured-in-place concrete, concrete pavers and bare earth are not recommended for cyclists. Concrete control joints and expansion joints can create a bumpy surface as these rigid paving units settle over time. Bare earth becomes rutted when wet. Wood chips are not recommended for cycling paths and shared-use paths because they can cause flat tires.

(.15) Travel Surfaces for On-Road Cycling Facilities

All shared lanes, cycling lanes and paved shoulders are to be constructed to the corresponding accepted provincial or municipal roadway standards. The recommended minimum for pavement is asphalt. Gravel roads and shoulders are generally not considered acceptable as a designated facility travel surface for cyclists.

(.16) Posted Speed Limits for Off-Road Pathways

A desirable posted speed limit for shared-use paths is 20 kilometres per hour. Although where rolling terrain and significant downgrades greater than 5 percent are prevalent, a design speed of 40 km/h should be used. On pathways with a stone fines travel surface, where cyclists tend to travel more slowly, a posted speed limit of 15 km/h should be used.

(.17) Stopping Distances for Recreational Cyclists

Cyclists require the following distances in order to come to a complete stop from various traveling speeds.

- 35 metres on flat sections with a design speed of 30 km/h
- 60 metres on hills with 5 percent grades, a design speed of 40 km/h
- 100 metres on hills with 10 percent grades, a design speed of 50 km/h

Stopping distances for in-line skaters are greater than for cyclists.

Refer to the *Guide for Development of Bicycle Facilities*, (American Association of State Highway and Transportation Officials, 1991) for complete details.

(.18) Detector Loops and Push Buttons for Traffic Signals

Many traffic signals in urban areas are activated by detector loops embedded in the roadway. These traffic loops respond to the magnetic field induced by the metal in a motor vehicle. The sensitivity of these loops can be adjusted to detect a bicycle without sensing passing vehicles by using a quadruple loop. This minimizes sensitivity outside the loop while increasing it within. Detector loops are not usually installed across the entire lane and it is quite possible that a waiting cyclist on the far right side of the roadway will not be detected. Painted pavement markings, either stencils or a series of three 150 mm diameter painted yellow dots, should be used to denote the most sensitive area of the loop. This will allow a cyclist to line up on the loop and activate the signal.

Detector loops should be positioned so that cyclists effectively activate traffic signals in all monitored through and turn lanes. Detector loops should extend widely enough within the lane to ensure that cyclists positioned on either side, such as those making right or left turns, are sensed. They should be positioned so that a cyclist waiting directly over a traffic stop bar (painted stop line) will be sensed.

(.19) Mid-Block Crossings

Mid-block crossings of roadways should be avoided. It is preferable for pedestrians and cyclists on a multi-use pathway to cross roadways at existing intersections. In the case of mid-block pedestrian crosswalks, cyclists using them are required by the *Highway Traffic Act* to stop, dismount and walk their bicycles across the roadway.

(.20) At-Grade Railway Crossings

Railway tracks can be especially hazardous for cyclists and pedestrians. They may not be flush with the road surface and there can be gaps on either side of the rail where a bicycle wheel can be trapped. The rails are metal therefore they can be slippery when wet.

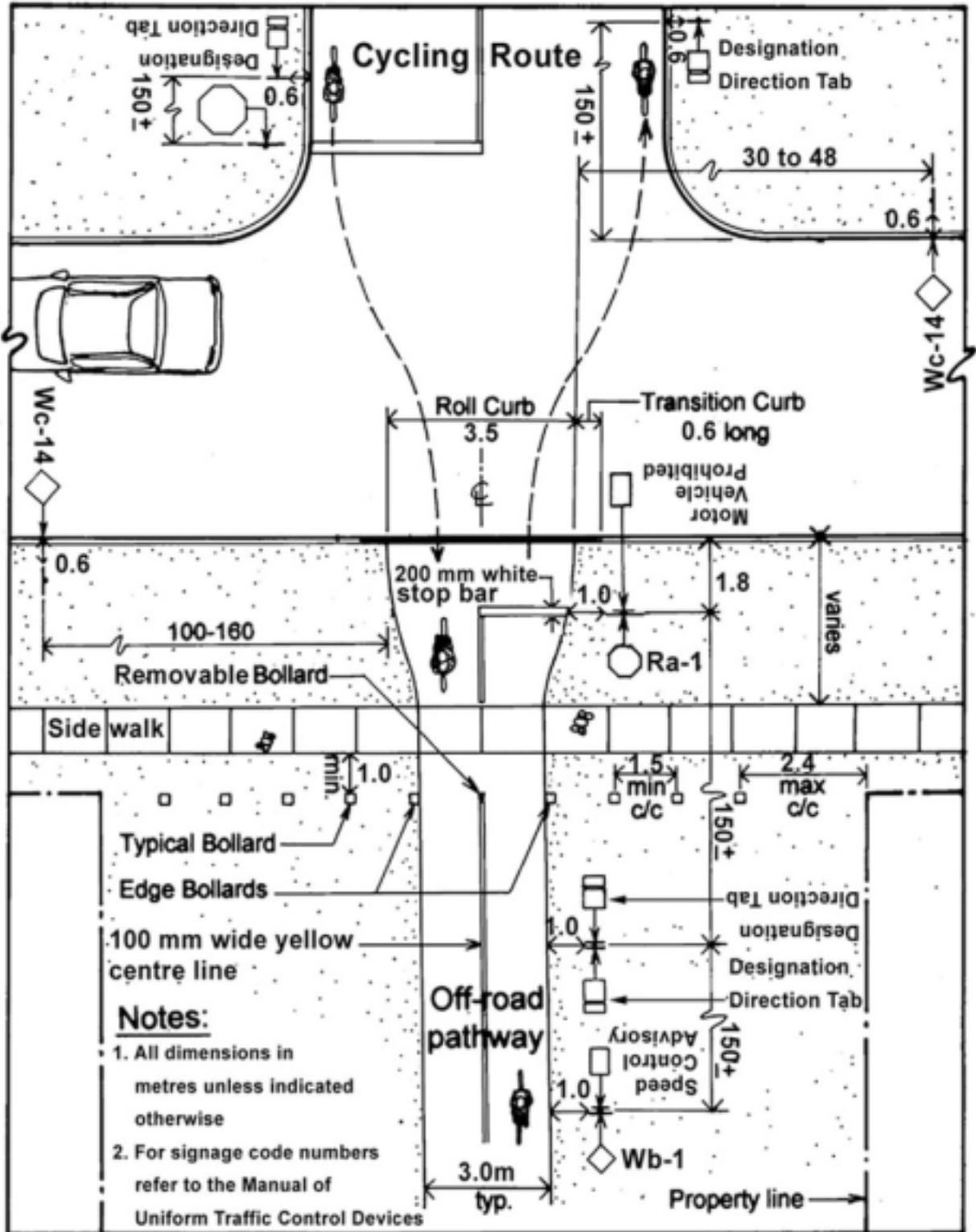
In addition, tracks often do not cross the roadway perpendicular to the direction of travel. Cyclists must slow and turn in order to cross the tracks properly at right angles. This can put them in conflict with other road users.

Where the tracks are not flush with the roadway the roadbed must be raised or rubber track guards ramping up to the rails installed. Rubber track guards have the added advantage of narrowing the rail gap and protecting bicycle wheels from entrapment. However, this is a costly solution because the rail bed must be re-laid. This is recommended in high use urban locations. Rubber track guards are only effective where train speeds are low, primarily in urban locations.

Where an off-road pathway makes a single track crossing, a stop sign with bollards, as described, should be installed as a minimum facility. At double track crossings, it is recommended that descending arm barricades be installed at a minimum. Ensure that descending arm barricades completely block the path of cyclists and pedestrians.

(.21) At-Grade Roadway Crossings

At the transition between an off-road multi-use pathway route and a roadway, it is advisable to stop cyclists before they proceed across sidewalks, ramp cuts or onto the roadway. A series of bollards, to be spaced in order to create 1.5 metre wide gaps, can be used to slow cyclists down immediately in advance of road crossings. These bollards would function in conjunction with access control bollards. See Guideline .22 - Bollards and Gates.



Typical Multi-Use Pathway / Cycling Route Transition
Figure 13

(.22) Bollards and Gates

Bollards, gates or barriers are used to control access to off-road pathway routes and at roadway crossings; however they should not be used as en route speed control devices. Ideally bollards should be highly visible, flexible, a minimum 1.2 metres high and fitted with reflectors so they can be highlighted at night by headlights. Bollards should be removable or hinged so service vehicles can access the pathway. A single, central bollard should be used whenever possible. This configuration helps prevent collisions between cyclists without causing undue congestion. The use of two bollards can cause congestion and collisions when cyclists riding in both directions converge into the narrow central opening. It is generally better to use one or three bollards. When more than one bollard must be used, they should be spaced 1.5 metres apart. The gap should not be narrowed to exclude motorcycles. The danger of a cyclist colliding with narrowly spaced bollards is more likely than a confrontation with a motorcyclist. Pathways can be signed to prohibit motorcyclists. Bollards should be removable so that City maintenance, utility companies and emergency vehicles can access the pathway.

Controlling access to a pathway by installing one or two "offset" gates is not recommended due to the potential for cyclists having collisions with such gates. If used, gates should extend a minimum of 2.0 metres beyond the edge of the pathway.

(.23) Fences and Other Barriers

Chain link fences (transparent), sound attenuation barriers (opaque) and pre-cast concrete "New Jersey" barriers (crash proof) are useful barriers for limiting the access to cycling facilities.

Where space is limited, narrow width fences or railings are recommended to separate off-road pathway routes from hazards such as adjacent roadways, busy pedestrian sidewalks, edges of water, steep drop-away side slopes, narrow bridge crossings, railway gates and puddle splashes. Fences should be made of a heavy-duty material such as tubular steel and be 1.2 metres high. They should not be filled in with a solid material. Metal mesh is an option as an infill material as long as it allows enough sunlight through to melt snow. Solid fences and barriers must be set back from roadways and pathways to avoid causing wind tunnels and unwanted snow deposition.

Curbing, because of its low height and poor visibility, is not recommended as a spatial barrier.

On rural pedestrian-priority pathways such as the Rideau Trail, fencing is typically page wire mesh on wood or metal line posts. This is the least expensive form of fence. It is intended primarily to contain livestock in pastures. Where it is necessary to maintain this containment, a wood stile can be installed. A stile is a two-sided ladder that allows a person to cross over a fence more easily.



Offset Stagger Gates



Fence Stile

(.24) Grade-Separated Crossings

Concerns associated with conflicts between off-road multi-use pathways and busy roadways or high-speed railways may be solved by the total vertical grade separation of these modes of travel at critical locations and crossings. Grade separations are either bridges or tunnels. These are extremely costly crossing solutions and are only possibly affordable for high use locations.



Examples of Stairs and Ramps

(.25) Access to Bridges and Tunnels

Often a narrow existing bridge or tunnel (i.e. railway trestle) is the only way to cross over or under an obstacle. There are four possible solutions to restrict access over or under these structures to improve safety concerns.

The first is to amalgamate pedestrian access to only one side of the roadway and widen the outside travel lanes using the resulting extra width. The second is to encourage cyclists onto whatever sidewalks are present, where they would be required to dismount and walk their bicycles. The third is to widen the right-of-way during future reconstruction or to add on extra travel width with a new parallel structure in the case of a bridge. The fourth is to establish "Cycling Priority" special-use lanes.

In all cases the minimum recommended bridge or tunnel width for an off-road two-way pathway is 3.3 metres. Any necessary alignment or grade changes should be made on the access ramps not on the bridge or tunnel itself. Tunnels should be well lit with special consideration made to security, maintenance and drainage. Abutments should be appropriately marked with hazard signage.

For travel efficiency, cyclists and pedestrians often prefer a tunnel to a bridge if it is shorter and easier to negotiate; however, tunnels do not provide opportunities for scenic views out or surveillance views in. In some areas, the lack of visibility may create security and vandalism concerns.

(.26) Bridges and Tunnels for Off-Road Pathways

There are two basic types of bridges, the linear bridge and the curved ramp-bridge. Selection of the appropriate design depends upon how high the bridge must rise and the available space.

A linear bridge is often preferable because it is the simplest to build and gives the cyclist a straight run out. This type of structure works best where the height rise is minimal (over a sunken roadway or railway) and where the ramp grade is less than 8 percent. Space limitations and increased clearance heights may require greater ramp grades. This can cause excessive exit speeds, especially dangerous if the bridge exits onto an intersection. In these situations, curved ramps should be used. The ramps should be elliptical, not circular, to reduce the grade. In addition, bridge entrances should not be at intersections where visibility is limited.

Bridges should be 0.6 metres wider than the pathways they are serving, to provide adequate side clearance of railings. They should also be wide enough and strong enough to support service vehicles where required. They should be paved or covered with a non-slip travel surface. This excludes untreated wooden or metal surfaces because they are slippery when wet or icy.

Bridges less than 3.3 metres wide should not be considered for riding cyclists as part of a designated multi-use pathway. Warning signage and centre line bollards can be used to slow cyclists down and alert them to a constricted bridge crossing ahead. In some cases it may be necessary to designate the bridge as a pedestrian-only precinct with signage that requests that cyclists walk their bicycles.



Railway Tunnel

Covered bridges provide protection from the wind and rain; however, they should be left open unless adequate ventilation is installed. If an enclosure is needed, a solid top with mesh sides is preferable.



Ramped Bridge



Linear Bridge



Ramped Bridge

(.27) Staircases

Staircases can pose a problem for cyclists and stroller users and those in wheelchairs if the bicycle or stroller has to be carried up or down a long distance. One solution is to build wheel ramps on either side of the staircase. This allows cyclists and stroller users to roll their vehicles up or down the staircase without having to carry them. Those in wheelchairs cannot use this type of facility.

Each ramp should be at least 150 mm wide. Preferably there should be two ramps, one for ascending and the other for descending. A ramp with a concave cross section is preferred, as it will help keep bicycle wheels within the ramp. Separate ramp systems need to be installed for those in wheelchairs.

For information on alternatives to stairways for persons with disabilities see Guideline (.4).



Stairs with Ramp for Bicycles and Strollers

(.28) Median Refuges for Crossing Roadways

A cyclist and pedestrian refuge within a roadway median is a place in the middle of a roadway where cyclists and pedestrians can wait comfortably before crossing the next lane(s) of traffic. It allows a cyclist or pedestrian to cross half of the road without waiting until both directions of traffic are clear. A refuge can consist of a curb cut in the existing median or a structure built specifically as a new crossing refuge. They are used where crossing of a busy roadway is required and where a central median or room for an island exists, but where a mid-block crossing signal light is undesirable.

For medians, the minimum width of the refuge should be 3.0 metres. This allows cyclists at least 0.5 metre clearance at either end of their bicycles. The refuge should be a minimum of 2.7 metres long. This allows cyclists or pedestrians from both directions to congregate. Too large a width is to be avoided as motorists could use it for turning. Standard painted crosswalk pavement markings should be used.

Where there is not an existing median, narrowing lanes and installing an island refuge is an option. This type of refuge must be physically defined with standard barrier curbs, not just paint on the roadway surface. The two halves of the island should extend 3.0 metres in either direction. The use of fitted-with-reflectors bollards is recommended.

A median refuge for crossing roadways is not appropriate as a refuge for cyclists on the roadway making left turns. If that turning movement must be specifically facilitated, cyclists turn lanes would be required on the roadway.

(.29) Rest Facilities

Any long off-road pathway should have periodic rest facilities. These should be at midway points, scenic lookouts, or near amenities such as parkettes, restaurants, picnic areas, etc. A rest stop should have, at a minimum, a bench and a bicycle parking rack. They should be located at a desirable interval of every 2.5 kilometres (i.e. every 10 minutes at a cycling speed of 15 km/h or every 30 minutes for walkers). Rest areas with a drinking water fountain, washroom facilities, and a pay telephone should be considered at all "major" parks and access points with parking lots having more than 20 motor vehicle spaces.

When constructing playgrounds, benches and water fountains it is recommended they be located well away from the general thoroughfare of the pathway.



Examples of Trailheads and Seating Areas

(.30) Lighting

Lighting of off-road pathways is generally not recommended because of the equipment, operating and maintenance costs involved. Lighting may also disturb the natural habitat of wildlife and cause other negative environmental impacts. It may encourage night use that may in turn disturb adjacent landowners or encourage users into isolated areas at night raising personal safety concerns. Nighttime park use is restricted by the rules of the specific property through which the pathway passes. General lighting, if desirable, should be examined on a case-by-case basis. In the interests of energy conservation and economy, lighting levels should be kept as low as practical while still facilitating the visual requirements of cycling.

If required under special circumstances, the following lighting standards for off-road pathway facilities are recommended:

TABLE NUMBER 4
Recommended Lighting Criteria

Luminance Criteria		Illuminance Criteria	
Average luminance at pavement (candella / m ²)	0.25	Average illuminance on horizontal plane for asphalt (lux)	3.5
Uniformity Ratio (average : minimum)	10:1	Uniformity Ratio (average : minimum)	10:1
Uniformity Ratio (maximum : minimum)	20:1	Uniformity Ratio (maximum : minimum)	20:1
Maximum Glare (veiling luminance at the eye)	50%	Average Glare (candella / m ²)	0.12

Source: Vélo Québec, *Technical Handbook of Bikeway Design*, 1992.

Bicycle parking areas with more than 20 spaces should be lighted to a minimum of 2 lux and an average of 5 lux. The uniformity ratio should be 6:1.

For information purposes the Roads and Transportation Association of Canada's *Guide to the Design of Roadway Lighting*, 1990, has established design criteria for various roadway classifications and pedestrian facilities.



Example of Poor Lighting at Radisson Hotel

Notes on Lighting Standards for On-Road Facilities

The recommended eye height for lighting calculations is 1.45 metres. The following stopping sight distances for motor vehicles under night driving conditions on dry roadways are recommended:

TABLE NUMBER 5
Design and Stopping Sight Distances

Design Speed (km / h)	Stopping sight distance (m)
50	65
60	85
70	110
80	140
90	170
100	200
110	220

Cyclists are required by the *Highway Traffic Act* to operate on their vehicles an illuminating white front light and a rear light or reflector visible from a distance of up to 150 metres at any time from one-half hour before sunset to one-half hour after sunrise and at any other time due to insufficient light or unfavourable atmospheric conditions.

TABLE NUMBER 6
Recommended Minimum Illumination Levels for On-Road Cycling Facilities

Type of Cycling Facility	Minimum Lux	Average Lux	Uniformity Ratio
On-road Cycling Route *			
Horizontal	2	5	6:1
Vertical	2	5	6:1
Intersection on a Lit Roadway *			
Horizontal	1	3	3:1
Vertical	2	5	3:1
Intersection on an Unlit Roadway			
Horizontal	1	3	5:1
Vertical	2	5	5:1
Tunnel, less than 10 metres long			
Horizontal	6	20	5:1
Vertical	7	24	5:1
Tunnel, 10 metres or more long			
Horizontal	10	40	5:1
Vertical	12	50	5:1

Legend: * = Illumination should be equal to that of the subject roadway.
 Source: Vélo Québec, *Technical Handbook of Bikeway Design*, 1992.

(.31) Bicycle Parking

There are some bicycle parking space standards in the *City of Kingston Downtown and Harbour Zoning By-law* but the consultant recommends those used by the Victoria Transport Policy Institute.

The Victoria Transport Policy has developed the following recommended guidelines for the provision of bicycle parking facilities. They identify two categories for facilities, long-term and short-term parking.

Long-term parking is for residences, employment centres and transit terminals to store bicycles and related equipment for several hours or days at a time. They must be protected from the weather and enclosed in a secure space. These facilities include lockers, storage rooms or fenced areas with restricted access.

Short-term parking is for streetscape and general public areas associated with commercial and recreational locations. Parking should be located as close as possible to the destination. If possible it should be protected from the weather. It should be visible to passers-by to discourage theft. Ideally, facilities should be located in areas lighted at night.

The City of Kingston should adopt inexpensive, straightforward, yet highly identifiable bicycle parking devices such as the post and ring rack, which support the body of the bicycle as well as facilitating the locking of both wheels. They are compatible with a wide variety of bicycles and locking devices.

Bicycle parking should be located in convenient locations that do not impede pedestrian traffic or snow removal. It should be located convenient to building entrances and serve all major destinations (shopping areas, residential buildings, services, employment centres, etc.)



Bicycle Lock-up with Advertising



Post and Ring Bicycle Lock-ups

TABLE NUMBER 7
Bicycle Parking Requirements

Land Use	Bicycle Spaces Required	Long-term	Short-term
RESIDENTIAL			
Single family / two family	N/A	N/A	N/A
Apartment / Townhouse	1 per residential unit, plus 6 space rack at each building entrance.	100%	6 space rack
COMERCIAL			
Hotel / Motel	1 per 15 rooms. In addition, when hotel/motel is greater than 75 rooms, a 6 space visitor rack should be provided	60%	40%
Office, retail sales of goods and services, restaurants, research establishments, laboratories	1 per 250 m ² for the first 5000 m ² and 1 per 500 m ² for any additional area	50%	50%
Shopping Centre	1 per 250 m ² GFA of gross leaseable area for the first 3000 m ² and 1 per 500 m ² of gross leaseable area for any additional area.	30%	70%
INDUSTRIAL (ALL)	1 per 950 m ² GFA	80%	20%
INSTITUTIONAL			
Hospitals	1 per 500 m ²	75%	25%
Schools	All levels: 1 per 10 employees	employees 10%	Students 90%
Elementary	1 per 10 students		
Junior Secondary	1 per 8 students		
Senior Secondary	1 per 8 students		
College	1 per 5 students		
University	1 per 5 students (full time, max. attendance)		
Churches	1 per 50 members		100%
Library / Museum/ Art Gallery	1 per 100 m ² GFA	20%	80%
Personal Care / Nursing Home / Group Home	1 per 15 dwelling units	75%	25%
Correctional Institutions	1 per 50 beds	70%	30%
CULTURAL AND RECREATIONAL			
Community Centre	1 per 80 m ² of GFA	20%	80%
Stadium, Arena, Pool, Exhibition Hall, similar places with spectator facilities	1 per 100 m ² of surface area	20%	80%
Gymnasium, Health Spa	1 per 80 m ² of surface area	20%	80%
Bowling Alley, Curling Rink	1 per 2 alleys or sheets	20%	80%
GFA = Gross Floor Area or the total area in square metres of all floors of a building			

Source: Victoria Transport Policy Institute, *Pedestrian and Bicycle Planning – A Guide to Best Practices*, 2003

(.32) Pathway and Cycling Facility Travel Surface Maintenance

Cyclists require higher facility maintenance standards than other roadway users because bicycles are inherently less stable than other vehicles. Bicycles are lightweight, single-tracking vehicles typically with narrow tires, a short wheelbase and limited shock absorbing capabilities. They require their operator to maintain control and balance throughout a range of travel speeds. Bicycles are easily de-stabilized by crosswinds, ice and travel surface debris. Acceleration and braking are less effective than for other road vehicles especially in wet conditions. At best, cyclists only have their helmets to protect themselves in the event of a crash whereas motorists benefit from the bulky protective barrier of their vehicles' frame and body. Cycling may also include three wheel tricycles, recumbent bike trailers, or trail-a-bikes, each having special requirements over single tracking vehicles.

Facility maintenance considerations must be developed concurrently with the planning, design and costing of the Facility Network. As well, strong policy commitments are necessary to ensure that acceptable maintenance standards are established and implemented. Facilities that are poorly designed or constructed in a substandard manner will require more maintenance attention and ongoing costs than those that were established properly in the first place. Low maintenance benefits should be a fundamental feasibility and facility design consideration.

Maintenance must not be compromised as a cost saving measure. Poorly maintained facilities are detrimental to the overall success of pedestrian and cycling networks for a variety of reasons. It is preferable to properly maintain what has been established rather than to expand the Facility Network beyond the capabilities of maintenance resources. A run down, low profile and/or dangerous facility will not attract new users. On-going maintenance communicates to existing and potential users that a facility is an important component of a vital, continuous system. The image and worth of the Facility Network will be based, to a large part, on the condition and upkeep of its component parts. It is therefore important to maintain high standards consistently throughout the system.

Facilities that are poorly maintained are a liability risk. It is possible that maintenance standards may need to be higher than the minimum on designated cycling facilities to provide a reasonable expectation that those designated facilities provide a superior level of service and address potential liability issues. See Appendix Four – *Managing Risk and Liability in Volume Two – Technical Appendices*. For on-road cycling facilities, it is generally recommended that whichever authority was responsible for roadway maintenance before improvements should be responsible for the maintenance of newly implemented cycling facilities. For off-road cycling facilities it may be necessary for the City of Kingston to pay or provide maintenance for pathways to ensure that they are maintained at an acceptable standard.

It would be beneficial to establish a coordinated "Spot Improvement Program" as a complement to the City's customer service telephone number (613) 546-0000 for reporting problems relating to roadways such as potholes. This program could be expanded to include off-road pathways. The Seattle Engineering Department has developed an example of this program. Their program makes small-scale, low-cost spot improvements such as the basic patching and sweeping of

existing transportation facilities most commonly used. Public input is vital in the implementation of the program.

In the City of Kingston, staff from the appropriate jurisdiction (i.e. the City of Kingston, Cataraqui Region Conservation Authority, MTO, etc.) would confirm this information with the reporter, and to let them know what spot improvement is to be made. The benefits of this program are that knowledgeable users are directly involved in maintenance monitoring and that monitoring coverage is both current and widespread. A spot improvement program would not take the place of the responsible agency's independent inspection schedule, which would continue on a regular, pre-determined basis.

Recommended maintenance standards are identified separately in the following categories - travel surface and drainage maintenance; roadside and path-side maintenance; signage and pavement marking maintenance; maintenance of auxiliary facilities and winter maintenance.

Travel surface irregularities on paved roadways and pathways are inevitable because of environmental effects (i.e. freeze / thaw cycle) and general wear. Irregularities take many forms. They affect mainly on-road cycling and off-road multi-use pathways. Irregularities and how to deal with them are summarized as follows:

(.32.1) Pot Holes and Depressions

Within on-road cycling lanes and the outside 1.5 metres of an on-road cycling route travel surface holes created by the loss of upper pavement layers are particularly significant to cyclists. Bicycle wheels can be damaged and cyclists can lose control or fall because of a hole within a prime cycling alignment. The 10 mm depth tolerance was developed and adopted by the City of Palo Alto, California and is recommended by the consultants for adaptation by the City of Kingston. The 100 mm hole width tolerance is based on the bridging capability of a 559 mm "mountain bike" size rim.

Recommended repairs for holes 10 mm deep or greater and between 100 and 300 mm across:

Deepen the cavity with a mechanical grinder to a minimum depth of 40 mm. Clean out the cavity by wire brushing, sandblasting or with compressed air. Apply an asphalt emulsion tack coat and let cure as per the manufacturer's directions. Fill cavity with HL3 fine asphalt, compact by hand tamping or mechanical roller. The finished surface is to match or slightly exceed the elevation of adjacent pavement following compaction.

Recommended repairs for holes 100 mm deep or greater and greater than 300 mm across are as follows:

Saw cut in a diamond shape (a square with its sides diagonal to the direction of travel) around the hole to the full depth of pavement. Ensure that granular base materials are of adequate depth and fully compacted. Clean out all dust and debris from the excavation. Apply asphalt emulsion tack coat to the vertical surfaces as per the manufacturer's directions. Fill excavation with HL3 fine asphalt. Compact by mechanical roller. Once

compacted, finished surface to match or be slightly higher than the elevation of adjacent pavement.

(.32.2) Cracks and Joints

Within on-road cycling lanes and the outside 1.5 metres of an on-road cycling route, cracks and joints that are parallel to the direction of travel should be filled because they can trap a bicycle wheel and affect the steering control of the cyclist. Cracks are isolated, irregular discontinuities of the pavement surface which generally do not affect cyclists if less than 13 mm wide or are perpendicular to the direction of travel. Joints, such as expansion and control joints, are linear discontinuities between two pavement surfaces generally directly parallel or perpendicular to the direction of travel. For cracks and joints perpendicular to the direction of travel, make maintenance reparations as per "potholes and depressions". The 13 mm gap tolerance was developed and adopted by the City of Palo Alto, California, which the Study consultants recommend for adoption by the City of Kingston.

Recommended reparations for cracks and joints 13 mm or wide and parallel to the direction of travel:

Clean out the cavity by grinding, wire brushing, sandblasting or with compressed air. Remove any existing joint filler material, such as pliable tar or rubberized compounds that cannot support the weight of a cyclist during the high temperatures of the summer. For cavities 13 to 50 mm wide fill first with closed cell polyethylene backing material and then with fast curing polyurethane sealant. Recess as per the manufacturer's direction.

"Unravelling" pavement, which is characterised by numerous cracks and surface break up are best repaired by replacement. The pavement edges of rural roadways, because they do not have the restraint of curbs, are most susceptible to unraveling. A full depth, fully-compacted granular shoulder and rounding should be maintained to minimize the possibility of unraveling.

Expansion joints, especially those associated with bridges, should be inspected annually to ensure they are cyclist compatible.

(.32.3) Bumps, Ripples and Steps

Within on-road cycling lanes and the outside 1.5 metres of an on-road cycling route surface irregularities relative to localized grade greater than 10 mm vertically or 3 percent of slope should be reduced. The 3 percent slope tolerance was developed and adopted by Montana Public Works. It is recommended for adoption by the City of Kingston. Surface raises are less hazardous and uncomfortable for cyclists than holes because they deflect motion upward rather than abruptly downward. Bumps are localized surface raises. Ripples are small repetitive bumps that create hazardous resonances for cyclists. A step occurs between two surfaces of pavement at differing grade. A step up in the direction of travel is more hazardous and uncomfortable than a step down. A step parallel to the direction of travel is more serious than a step perpendicular to the direction of travel.

Recommended reparations for bumps with greater than 3 percent slope:

Generally bumps greater than 1200 mm should be saw cut around, excavated and repaired as per "potholes greater than 300 mm across". Smaller bumps should be reduced in height by burning off or cold planing with a mechanical grinder to a maximum 3 percent of the slope. It is important to evaluate the cause of a bump and to eliminate that cause when making maintenance reparations.

Recommended reparations for ripples and steps with 10 mm or greater vertical difference:

Ripples are best repaired by the replacement of pavement. Burning off or cold planing with a mechanical grinder should eliminate steps parallel to the direction of travel. The transition slope is recommended to be a maximum of 3 percent. A 10 mm rise would therefore require a 300 mm transition. Steps perpendicular to the direction of travel should be reduced to a maximum acceptable height of less than 10 mm or eliminated.

(.32.4) Travel Surface Texture

Cyclists and in-line skaters are affected by surface texture in two ways. Firstly, coarse textured pavement has a high coefficient of friction which requires more of a cyclist's or in-line skater's energy to maintain travel speed. Secondly, smooth textured surfaces adversely affect the grip of braking and turning tires especially in wet conditions. Pavement surfaces that present problems to cyclists are chip seal treatments, open metal grating, smooth metal plates, wood planking and untextured concrete. Wherever possible these surfaces should be replaced with hot laid asphalt, which has the best balance of texture characteristics for cyclists. Maintaining favourable conditions on surfaces that cannot be replaced include the following measures:

- Cover open metal grating with recessed sections of pre-cast concrete or wood planking.
- Attach fine steel mesh, grit strips, paint / silica sand mixtures or perforations to smooth metal plates and wood planking.
- Coarse sandblast or bush hammer texture into the surface of smooth concrete.

Stone fines or crushed stone pathways may be used for multi-use pathways in non-urban areas with less than 500 users per day and predominantly pedestrian and recreational cyclist travel. Compared to asphalt pathways stone fines pathways are considered higher maintenance facilities. The travel surface of stone fines pathways should be inspected, as required, to ensure that they are free of dangerous ruts, washouts and weed growth within the travel surface. A well-used pathway will be continually compacted by its users. However, following major rainstorms and spring thaws they will require re-compacting with a mechanical roller.

(.32.5) Pavement Patches and other Temporary Conditions

Pavement patches, such as those created for the repair of utilities, should comply with the standards and reparations specified above. Roadwork specifications must require contractors to restore pavement impacted by construction to pre-construction conditions. Temporary pavement patches must be made as smooth as possible and repaired to a permanent condition at the completion of the project. Detours and metal plates used during construction should be made cyclist compatible. Temporary bumps and sections of gravel pavement are to be clearly marked with warning signs. Sand and gravel must be regularly swept off pavement in the vicinity of construction sites.



Spring Pothole Repair

(.32.6) Pavement Sweeping

Regular pavement sweeping is especially important to cyclists for the following reasons. Bicycles must be leaned to make higher speed turns. Narrow, high-pressure bicycle tires have a very small contact area compared to four-wheel motor vehicles. Bicycle tires are relatively thin and much more prone to puncture. Bicycles are lightweight, which makes traction and braking less effective. Cyclists travel for the most part near the pavement edge where road debris is most likely to collect and where the sweeping effect of motor vehicle traffic is most limited. Cyclists often travel on areas of the roadway not traveled by motor vehicles.

Recommended maintenance:

- Each month, or on an as-required seasonal basis, mechanically sweep all designated pedestrian and cycling facilities and off-road asphalt pathways.
- Ensure that sand, glass and other debris have been completely removed from the travel surface. When it is most certain that freezing temperatures are finished for the winter season and snow has melted, spring roadway sweeping and cleaning operations should give priority attention to cycling facilities. Intersections and sharp curves are areas of special importance.

(.32.7) Sewer Grates and Other Utility Covers

Metal sewer grates, manholes, and other utility covers are hazards for cyclists because they are slippery when wet, often not flush with the adjacent roadway surface, and a prime location for potholes. Sewer grates can trap bicycle wheels if openings are parallel to the direction of travel. The recommended solution is to adopt a bicycle compatible grate type with openings perpendicular or diagonal to the direction of travel. See Ontario Provincial Standard Drawing - 610.01 rev.1. The use of curb inlets or catch basins in coves outside the travel surface is the preferred solution for new roadways.

In the case of abandoned manhole covers on roads or other locations, it is recommended to countersink the manhole and cover it with asphalt. High sewer grates and manhole covers can be made flush by locally resurfacing the roadway. Collars can be inserted or removed on sewer grates and manhole covers to make them flush with the adjacent roadway.

Ensure grates are flush with surrounding pavement. It is recommended that grates have spaces sized and shaped to efficiently allow runoff water to pass through. Ponding water (puddles) formed because of slow infiltration should be eliminated by the redesign and/or replacement of problem sewer grates.

It is important to raise sewer grates and utility covers following the resurfacing of roadways and pathways.

(.32.8) Surface Drainage

Besides the physical discomfort of being soaked or sprayed by water, cyclists can lose steering control when they encounter water ponding on roadways or pathways. Ensure that designated cycling facilities have adequate surface slopes and are free of depressions that trap runoff water.

Asphalt pavement is particularly susceptible to unraveling and cracking when high moisture content in the soil sub-base, caused by poor drainage conditions, weakens or undermines the pavement and base.

(.33) Roadside and Pathside Edge Maintenance

The following are recommended maintenance standards for roadside and pathside edges:

- Vegetation (tree branches, bushes and grasses) should be removed annually to the preferred clearance height of 3.0 metres from the roadway and pathway travel surface. Vegetation should be removed annually to the preferred horizontal clearance distance of 0.5 metres from the roadway or pathway edge. Reduce adverse impact on visibility by removing vegetation, fences, signs, parked vehicles, etc. where necessary within sight lines.
- Ensure that grass is mowed and garbage removed within the established right-of-way of designated pathway and cycling facilities on a minimum monthly basis or as required.

- Ensure that the roots of trees in the vicinity of off-road pathways are not cracking or forcing up pathway pavement. It may be necessary to replace pavement, prune roots or install root barriers to repair this damage. Ideally, pathways should be located a minimum of 2.5 metres from large trees.
- It is recommended that all concrete curbs and gutters along designated Facility Network facilities be inspected annually and repaired to ensure integrity, smooth transitions at curb cuts and that gaps greater than 13 mm are not parallel to the direction of travel.



Discontinuous Sidewalk/ Defacto Cycling Lane

(.34) Signage and Pavement Marking Maintenance

It is important that vital information is being communicated continuously along a pathway or cycling roadway facility. All signage should be inspected once per year by the appropriate, responsible authority to check for damage and weathering. This inspection should be performed in early spring to check for frost heaving and winter damage. Signs should be cleaned at least yearly but may require more frequent cleaning depending on location, especially along high volume or particularly dusty roads. A sign maintenance record should be used to list sign conditions and repair notes. The City's Customer Service Department reviews reports of damage and vandalism to City property.

At locations where accidents occur with some frequency it is recommended that the effectiveness of signage be tested and evaluated using methods acceptable to the municipality or government jurisdiction.

Recommended inspection and repairs:

- **Sign Face:**
Inspect plastic sheeting to ensure proper adhesion and absence of cracks, tears, blisters, etc. Repair minor damage with pressure sensitive plastic sheeting according to the manufacturer's specifications. Replace entire face if damage is severe.
- **Supports:**
Ensure all supports are firmly placed plumb and free from cracks, rot, rust, or other damage.
- **Hardware:**
Inspect all bolts, nuts and washers to ensure that they are secure and free from damage. Tighten or replace as required.
- **Cleaning:**
Clean all signs with water to remove dust and dirt. Oil, wax and spray paint vandalism should be removed with a solvent, and then washed with a weak detergent.
- **Painted pavement markings:**
Consisting of cycling lane lines and symbol stencils should be inspected once per year by the appropriate, responsible authority. Markings that have become worn should be repainted immediately. It may be necessary to grind off portions of residual pavement paint to ensure that built up layers do not become a slippery surface hazard.

(.35) Maintenance of Auxiliary Facilities

It is recommended that all auxiliary facilities associated with the Facility Network be inspected and repaired annually. These elements would include bollards and gates, bicycle parking devices, light fixtures, fences and other barriers, etc. Maintenance would repair damage due to wear, environmental conditions, vandalism, accidents, misuse or other causes.

(.36) Winter Maintenance

Walking and cycling are physical activities that increase the ambient temperature of the traveler. With the use of proper clothing, below freezing temperatures are not necessarily a deterrent to comfortable travel, however, the winter maintenance of transportation facilities can be a significant deterrent.

In winter conditions, cyclists require higher facility maintenance standards than other roadway users because bicycles are inherently less stable than other vehicles. Bicycles are lightweight, single-tracking vehicles that require their operator to maintain control and balance throughout a range of travel speeds. Bicycles are easily de-stabilized by crosswinds; travel surface ice and snow build up. Acceleration and braking are less spontaneous and effective than for other road vehicles especially in slippery winter conditions.

In order for cyclists to more comfortably and effectively continue cycling throughout the winter it is recommended that designated on-road cycling facilities and key off-road pathways of the Facility Network be the focus of higher standard winter maintenance efforts. The standard procedure for most municipalities is to clear snow and ice from the public roadway system on a priority basis. Starting with the first winter following implementation, designated commuter-oriented cycling facilities should be maintained to the following recommended standards to optimize their year-round usage:

- Designated facilities, both on and off-road, are to be ploughed of snow to their full travel surface width on a priority basis when the depth of snow exceeds 50 mm. It may be necessary to use narrower plough blades mounted on light trucks to plough snow to the sides of off-road pathways.
- Immediately after ice storms on a priority basis or when residual snow depth is less than 50 mm on a regular priority basis, apply salt or other ice melters to unfreeze water on designated facilities. Although not recommended, due to the potential damage caused to the mechanical moving parts of bicycles: sand applied to ice on roadways and pathways to provide emergency short-term traction should be swept up and removed from designated cycling facilities as soon as possible after the ice has melted or been scraped off. Black ice is particularly dangerous to pedestrians and cyclists traveling in the late fall and early spring. Low-lying areas and bridges are a particular problem for icing when the temperature falls.
- The sodium chloride in rock salt, commonly used to melt snow and ice, promotes the oxidation and deterioration of metal parts on vehicles. Sand, as an alternative, reduces the traction of bicycle tires and wears the chain drive parts and wheel rims of bicycles. It is recommended that calcium chloride ice melters be considered for application along designated cycling facilities. It is applied at a rate of 70 to 135 grams per square metre. It does not pit asphalt or leave a residue. It is 30 times more effective than rock salt at 0°C.
- High snow banks can reduce visibility and discharge melt water along the edge of roadways and pathways long into the spring if not removed. Steep sided snow banks can reduce both the horizontal and vertical clearances of facilities. It is recommended that roadside snow deposition be reduced to a maximum height of 0.3 metres above the travel surface grade of designated cycling facilities for a distance of 1.2 metres beyond the travel surface. This maintenance should be undertaken only after all other priorities of municipal roads have been ploughed.

- Designated cycling facilities should be given priority attention for spring travel surface sweeping and cleaning to ensure that sand and other debris left as a result of winter has been completely removed.

(.37) Sewer Grates and Other Utility Covers

Metal sewer grates, manholes and other utility covers are hazards for cyclists because they are slippery when wet, often not flush with the adjacent roadway surface and a prime location for potholes. Sewer grates can trap bicycle wheels if openings are parallel to the direction of travel. The recommended solution is to adopt a bicycle compatible grate type with openings perpendicular or diagonal to the direction of travel. See Ontario Provincial Standard Drawing - 610.01 rev.1. Curb inlets or sewers in coves outside the travel surface are preferred solutions for new roadways.

(.38) Curbs and Shoulders

Where curbs are required, concrete barrier curbs are recommended. They should be 150 mm high, with a rounded edge (i.e. radius of 25 mm) and ideally without concrete gutters. Barrier curbs, by containing vehicular traffic within the travel portion of the roadway, reduce the likelihood of cyclists being run off the road by motorists. Roll curbs, wide concrete gutter pans and asphalt boulevard strips adjacent to curbs are not recommended. These may confuse some motorists as to where to expect cyclists to be travelling. As well, the transition between these features and the outside lane is potentially dangerous for a cyclist to negotiate because of edge debris, cracks parallel to the direction of travel, and sudden changes in grade.

Gravel shoulders adjacent to cycling routes should be composed of fully compacted granular material of an approved 19 mm diameter. The grade difference between travel surface and shoulder should be minimal. Shoulder slopes should be 3 percent or less.

(.39) Delayed Green Traffic Signals

Since pedestrians and cyclists generally accelerate and travel at slower speeds than motorized vehicles, they take longer to clear an intersection. Delaying the green light or providing a four-way red signal allows the intersection to clear before cross traffic proceeds.

(.40) Contra-Flow Cycling Lanes

Contra-flow cycling lanes should be avoided unless critical connections are required. Cyclists traveling in the opposite direction of vehicle traffic can surprise motorists or not be seen and cause accidents. Cyclists should generally travel as a vehicle in the direction of traffic.

A contra-flow cycling lane can be envisioned as a one-way roadway incorporating a cycling lane and through lane (or shared-use road lane) in the normal direction with a one-way cycling lane in the opposite direction. The contra-flow cycling lane is on the left side of the road, which must be

made clear of stopped or parked traffic. This type of special-use lane is especially useful in urban areas where streets have been converted from two-way to one-way. Since most one-way streets were originally two-way, there will usually be enough existing road width for a 1.5 metre cycling lane. These roads must be clearly marked and painted with a solid yellow and a no passing "centre" line. Special signage indicating one-way motor vehicle and two-way cycling must be installed.

(.41) On-Road Parking for Motor Vehicles

The density and turnover of on-road parking greatly affects the comfort of passing cyclists. Therefore, avoid designating roads as cycling routes if they have busy perpendicular or angled parking configurations. Parallel parking is the preferred alternative. Parallel parking spaces should be a minimum of 2.7 metres wide where they are located adjacent to designated cycling routes or cycling lanes. Ideally parallel parking spaces should be recessed in parking bays and not located within 4 metres of an intersection or major driveway. Warning signs indicating to caution motorists when opening left-side doors should be considered. These signs could be installed in association with parking meters.

The City should consider moving on-road parking on one-way streets consistently to the left side of the roadway in consideration of cyclists who conventionally travel on the right side of the roadway.

(.42) Roadway Turn Lanes

Roadway turn lanes are installed to provide turning vehicles a place to slow down and wait before making the intended turn. These right and left turn lanes allow the other roadway through-lanes to remain free flowing. Continuous left turn lanes do not pose a problem for cyclists. In fact, on a multi-lane roadway a central left turn lane is a benefit to cyclists. Long or continuous right turn lanes, on the other hand, are difficult for cyclists. Riding on the right side of these lanes puts them in conflict with right turning vehicles. Riding on the left side of these lanes puts them in conflict with vehicles merging into the lane to turn right. Right turn lanes should be short in length and wide enough to allow in lane maneuvering by cyclists.

Wherever possible cycling lanes should be continuous and on the left side of right turn lanes.



Cycling Lane Adjacent to a Long Right Turn Lane

4.5 Implementation Strategy

The basis of the Implementation Strategy is the progressive development of a network of high-profile pedestrian and cycling facilities and support programs that:

- Consider the cost / benefit advantages of initiating a support program rather than only a facility.
- Upgrade existing municipal pathways to new and higher municipal standards to avoid liability exposure to the City as a result of accidents that may be incurred by the public.
- Focus attention on areas of existing high use, such as Queen’s University and the Downtown Waterfront.
- Improve the use, comfort and efficiency of known areas of challenge to pedestrian and cycling travel, such as the La Salle Causeway (Federally owned).
- Create links between discontinuous sections of existing linear facilities.
- Expand the network of facilities into areas of the City where no facilities currently exist.
- Acquire or negotiate access agreements for properties that are important to the long-term continuity of municipal pathway facilities. In some cases it may be necessary to “land bank” critical properties temporarily and develop them at a later date.
- Make connections to destinations relevant to pedestrians and cyclists.
- Demonstrate examples of new forms of facilities such as pedestrian precincts, cycling routes and multi-modal roadways.
- Expand the scope of work of scheduled road improvement and utility capital works projects to include auxiliary pedestrian and cycling facility development.
- Develop projects that have a high public profile so that they will be self-promoting.
- Create self-contained pedestrian and cycling loops.
- Establish the Lake Ontario Waterfront Trail through Kingston. This will be a combination of designated on and off-road facilities.
- Establish a high-profile, multi-use connection between potential future facilities associated with the Lake Ontario Waterfront Trail and the K & P abandoned railway.
- Establish alignments through Kingston proposed by the Ontario Bike Route Network as designated cycling facilities. The goal of the Ontario Bike Route Network group is to

have routes of provincial importance designated on maps and with signs to promote cycle tourism, local awareness and respect from motorists.

Based on the four Facility Network Master Plans, a number of specific “Initial Projects” have been identified. These projects are “packaged” in such a way that they represent a substantial and identifiable body of work. Wherever possible they have significant endpoints or destinations. They are generally of a length that could be implemented in a reasonable timeframe and within a manageable budget.

The following Initial Projects are listed as a logical sequence consistent with the stated Implementation Strategy as listed on the previous page. However, the projects are effectively a “shopping list” to be chosen from by the City as development opportunities and funding become available. Therefore, it should be noted that they are not listed in any particular order.

4.5.1 Description and Cost Estimates of Potential Initial Projects

These Initial Projects are seen as having the potential to provide more immediate public benefits, have fewer implementation challenges and would be generally less costly than Long-Term Projects. The following should be read in conjunction with the Typical Forms of Recommended Facilities in Section 4.2.1 and the three Facility Network Master Plans. In some cases detailed cost estimates are included in Appendix Seven – *Construction Cost Factors and Cost Estimates for Initial Projects* in *Volume Two – Technical Appendices*.

Pedestrian Focus Facility Projects

1. Upgrade the Waterfront Pathway through the Downtown

Summary

Upgrade to minimum standards the existing Waterfront Pathway from Simcoe Street to Brock Street (Confederation Park). This would involve eliminating trip hazards, pavement inconsistencies and installing hand railings along the water’s edge. Replace existing signs concerning permitted uses on the pathway with replacements that are consistent with new municipal policies.

Existing Conditions

The existing pathway begins at Simcoe Street and ends at Brock Street. This section of pathway consists of a series of formal and informal path segments that follow the shoreline and cross public and private properties.

Beginning at the foot of Simcoe Street, an asphalt pathway runs through the park and behind the Pump House Steam Museum property. This park features several historic monuments located along the pathway. The facility continues behind the Pump House and crosses a small slip. The slip crossing consists of a narrow aluminium bridge that can be removed to permit access to the

Museum’s boathouse as required. The asphalt pathway continues to a wooden ramp running along the side of the adjacent docking slip. The walkway continues past the Shipyard Apartment Building into an unmarked parking lot. Most users intent on following the shoreline cross this parking lot and the Marine Museum’s entry garden. They proceed along the Marine Museum slip past the museum building towards the Alexander Henry Bed and Breakfast boat. This boat is moored at the end of the slipway. This wide grassed slip and has several thin asphalt strips leading to the end of the pier, which offers a scenic view of the water and two benches. The pathway does not go to the end of the pier. It follows the fenced slip well then runs along the backside of the building. The segment adjacent to the slip well is a narrow concrete walkway that faces the water and has no railings or barriers.

At the end of this slip the walkway is very informal. The worn desire line crosses through a private business parking lot and a dead-end street. An asphalt pathway follows the waterfront perimeter of this property and leads to a wide asphalt pathway along the edge of the marina. This segment of walkway, facing east does not have any railing separating the users from the drop-off. The walkway continues around the marina along the base of the Radisson Hotel. The hotel building forms a covered pathway. However, this section of public access way does not feel inviting or comfortable. On the east side of the Radisson Hotel the path leads to the end of Clarence Street and arrives at the parking lot of Confederation Park, opposite Kingston City Hall.

Proposed Facility

It is recommended that the City acquire an easement or access agreement through the parking lot behind the QuickLaw building. The section of pathway leading up to the QuickLaw parking lot requires asphalt surfacing.

The next section of required pathway is part of the slip structure behind the Marine Museum. The concrete tops or walls are badly heaved and require resurfacing, as well as, a railing along the edge of the slipway.

Directional signs are required consistently along the entire pathway. The walkway behind the Shipyard Apartments and leading around the Marine Museum are the highest priority for signage, followed by the pathways around the marinas.

Numerous trip hazards exist along this section of pathway. These will need to be individually marked in the field and repaired.

Costs

The summary of costs is as follows:

191 m of 1.2 high metal hand railing @ \$220 / m	\$42,020
1,070 m of basic designation and warning signage	\$1,926
4 walkway / roadway crossings @ \$6,000 / crossing	\$24,000
50 m of new 3.0 m wide asphalt walkway @ \$106 / m	\$5,300
Total Estimated Capital Cost to the City of Kingston	\$73,246

2. Formalize public access to the “Kingston East Single-Track Trail”

Summary

Formalize public access to the “Kingston East Single-Track Trail” through Ministry of National Defence, privately owned lands and the Ravensview Water Pollution Control Plant. The extent of the proposed initial formalization and designation would be between the existing gravel parking lot in the south east corner of the Fort Henry property and the west end of the roadway in the Ravensview Water Pollution Control Plant site.

Existing Conditions

There exists in Kingston East a well-used single-track trail that meanders along the St. Lawrence River north shoreline east of Fort Henry. It eventually crosses north of Highway 2, crossing private farmland, as it becomes less well used and defined. The pathway is located on Ministry of National Defence property between open parking lots east of Fort Henry and the west end of La Salle Boulevard. It passes through Arrowhead Beach Park and behind the Batoche Community Centre. The off-road alignment is discontinuous where it follows Cassino Court and Canal du Nord Drive, two residential roadways located in Fort Henry Heights. The pathway crosses a private property north of La Salle Boulevard and crosses through the Ravensview Water Pollution Control Plant. It is proposed that the first phase of the formalization of the trail would end at the Water Pollution Control Plant. The pathway itself is rugged and scenic. The majority of the alignment is through forested shoreline, with a number of hills and views to the St. Lawrence River.

Proposed Facility

The pathway itself requires no real improvements other than designation signage. This signage is important because it formalizes that the user is permitted to be on the pathway and that the pathway has an ultimate destination.

The significant challenge with this project is to secure easements or other arrangements to allow the public to access these lands. The principal landholder is the Ministry of National Defence. Apparently, Canadian Forces Base Kingston is amiable to opening up these lands that have traditionally been the exclusive domain of National Defence personnel. Although there are chain link fences around the Vimy Barracks residential area and “No Trespassing” signs at entrances to the trail, there does not appear to be any concern about the ease in which the public can currently access this pathway. However, if and when designation signs are erected and the City promotes the use of this pathway, increased public presence should be anticipated. The pathway could be developed as the pedestrian-priority component of a Waterfront Trail extending east of Kingston. The long-distance, on-road cycling component of the Waterfront Trail would be facilitated on Highway 2.

It is recommended that the pathway be designated as a pedestrian priority facility but that cycling not be restricted. This pathway is currently a popular off-road (mountain bike) cycling facility. It is this Study’s intention to maintain existing uses in the near term. It is important for the off-road cycling community to be courteous and considerate of pedestrians to maintain a good relationship with the public.

This pathway deserves to be enjoyed by more citizens and visitors to Kingston. With its close proximity to urban Kingston and the nationally significant Fort Henry site, this pathway is an excellent resource.

Costs

For details on costing see Appendix Seven in *Volume Two – Technical Appendices*.

The summary of costs is as follows:

Designation signage	\$12,132
Granular base material, grading and paving	\$5,400
Pathway / roadway transitions	\$30,000
General improvements	\$12,000
Terminus features	\$18,000
Total Estimated Capital Cost to the City of Kingston	\$77,532

3. Formalize public access to a continuous and identifiable, primarily off-road Rideau Trail through the Urban Area

Summary

Establish a continuous and identifiable off-road Rideau Trail between Greenview Drive and the K & P abandoned railway. This objective may need to be facilitated in association with new sections of multi-use pathway rather than a pedestrian-only hiking trail that would be the ideal. The extent of the proposed initial formalization and designation would be between the trailhead parking lot on King Street West and the junction with the K & P abandoned railway 240 metres west of the former Cataraqui Creek railway bridge.

Existing Conditions

The Rideau Trail is an existing pedestrian priority hiking trail that extends from Kingston to Ottawa through Smith Falls. It is approximately 300 kilometres long and runs roughly parallel to the Rideau Canal. The trail is located on roadway rights-of-way, private property and public property managed by authorities such as the Cataraqui Region Conservation Authority. The trail was originally proposed in February 1971 and the official opening was in November 1971. The Rideau Trail Association, a volunteer organization with a membership of approximately 1,100, maintains the trail. In 2003, an annual individual / family membership costs \$20. A guidebook showing the location of the trail is available to members for \$22. The Association has a newsletter and maintains a web site www.rta.ncf.ca. The trail itself is theoretically indicated in the field with orange triangular markers, however, one really needs the detail in the guidebook to find and follow the trail. The Rideau Trail Association has not provided an opinion on this Study's proposal for the City of Kingston to formalize and designate, with clear pedestrian scale signage, the alignment of the Rideau Trail within the urban area of Kingston.

The current official alignment of the Rideau Trail is shown on the Urban Area - Pedestrian Focus - Map 3. It is an archetypal hiking trail between the King Street West trailhead and Greenview Drive through the Little Cataraqui Creek Valleylands. From south to north it takes

the form of a double track and single-track facility. It has sections of wooden boardwalk over wetlands and makes two formal crossings of the DuPont Canada private spurline track. It follows the sidewalk on Greenview Drive and is on-road on Queen Mary Road. It crosses Bath Road at a signalized intersection. From the north end of Queen Mary Road and the Parkway / Princess Street signalized intersection, the trail follows a municipal Hydro easement. There are side paths in Rivermeade and Grenville Parks.

The current official alignment of the Rideau Trail then continues on the north side of Princess Street and crosses the CNR mainline at the Kingston Train Station. It continues across Counter Street and follows Purdy's Court and Purdy's Mill Road into the Cataraqui Cemetery. It follows Sydenham Road, McIvor Road and Bullen Road before it connects with the K & P abandoned railway at Jackson Mill Road.

Proposed Facility

It is recommended by the *Kingston Cycling and Pathways Study* consultants that the on-road alignments of the existing Rideau Trail on Princess Street, Counter Street and Sydenham Road, as well as the unsignalized pedestrian crossing of the CNR mainline be replaced by an alternative alignment. The proposed alternative would require the City to secure an easement or public right-of-way on private property on the west side of Little Cataraqui Creek between Counter Street and the K & P abandoned railway. This alignment is also proposed as a possible long-term solution to connect the K & P abandoned railway to the Waterfront Trail. It is an important long-term objective to connect the Kingston Railway Station to the K & P abandoned railway and the Little Cataraqui Creek Conservation Area with an off-road multi-use pathway. This initial pedestrian focus project formalizes this alignment for potential upgrade in the future.

Other requirements of this initial project are new sidewalks on Queen Mary Road, Parkway, Portsmouth Avenue and Counter Street. It is recommended that a future signalized intersection at Counter Street / Portsmouth Avenue have pedestrian crossing signals and pedestrian activated push buttons. Concrete sidewalks and curb cuts for persons with disabilities are required. The existing at-grade Counter Street / CNR mainline crossing should be upgraded on the north side of the roadway with chain-link corral fencing, warning signage and track infill material appropriate for use by pedestrians. It is recommended that a side pathway be established to access the Cataraqui Cemetery via the east end of Purdy's Mills Road.

Costs

For details on costing see Appendix Seven in *Volume Two – Technical Appendices*.

Summary of costs are as follows:

Granular base materials, grading, pathway paving and sidewalks	\$93,300
Pathway and sidewalk designation signage	\$18,108
Pathway/roadway/railway transitions and crossings	\$30,000
Clearing vegetation and wetland construction	\$8,000

Total Estimated Capital Cost to the City of Kingston **\$149,408**

4. Establish continuous pedestrian facilities on Bath Road between Portsmouth Avenue and Days Road

Summary

Establish sidewalks and/or sections of multi-use pathway on Bath Road between Portsmouth Avenue and Armstrong Road where there are gaps in existing sidewalks.

Existing Conditions

Bath Road between Portsmouth Avenue and Days Road is a major multi-lane urban arterial roadway. Immediately east of Queen Mary Road adjacent land use is primarily residential. West of Queen Mary Road adjacent land use is suburban strip mall commercial on the north side and the Collins Bay Penitentiary and La Salle Park Plaza on the south side. The roadway and its right-of-way, as well as the physical form of the development are generally not sympathetic to walking. However, based on casual observation of the pathway on the north boulevard, people do walk along this roadway. In support of Kingston's goal to encourage more utilitarian pedestrian travel and less auto dependency, it is important to facilitate pedestrians on Bath Road. Sidewalks are missing on the north side between Portsmouth Avenue and Grenville Road (there is a fairly steep hill at this location) and between the mid-block driveway to Frontenac Mall (east of Centennial Drive) and Days Road. There do exist signalized intersections at Portsmouth Avenue, Queen Mary Road, Armstrong Road, Centennial Drive, Tanner Drive, the Bingo Hall driveway, Gardiners Road and Days Road.

Proposed Facility

It is recommended that standard municipal concrete sidewalks with a minimum width of 1.5 metres be installed on north side of Bath Road to create a continuous pedestrian facility on one side of Bath Road. Wherever possible the sidewalk should be set back from the roadway curb the maximum allowable distance within the roadway right-of-way, so as to create a separation distance from the travel service. Curb cuts for persons with disabilities should be provided at all intersections. Sidewalks should be continuous through driveways. The objective of this project is to establish basic pedestrian facilities. Complementary facilities such a shade trees and street furniture have not been included.

Costs

The approximate lengths of required sidewalks, listed east to west, are as follows:

Portsmouth Avenue to Grenville Road	330 metres
Frontenac Mall driveway to Centennial Drive	210 metres
Centennial Drive to Tanner Drive	830 metres
Tanner Drive to the Bingo Hall driveway	280 metres
The Bingo Hall driveway to Gardiners Road	330 metres
Gardiners Road to Days Road	260 metres

Total length of the sidewalks 2,240 metres at \$90 per metre

The Estimated Capital Cost to the City of Kingston

\$201,600

Approximately 2.24 kilometres of facility at a cost of approximately \$90,000 per kilometre.

Recreational Focus Facility Projects

1. Rural Kingston Portion of the K & P Abandoned Railway

Summary

Purchase and plan the development of the Kingston & Pembroke (K & P) abandoned railway as a multi-use pathway. The first phase of development would be the rural section of the abandonment defined as the alignment between Orser Road and the Little Cataraqui Creek Conservation Area. Establishing with MTO the two vital Highway 401 crossings - a replacement to the existing rail tunnel and a pathway tunnel to the Little Cataraqui Creek Conservation Area are required.

Background

The potential development of a pathway on the K & P abandoned railway will be an important test of the City's intentions to facilitate recreational pedestrian and cycling travel. The idea of a K & P Trail has a long history and has been the subject of a number of meetings and past discussion. The potential facility is an outstanding opportunity to provide the citizens and visitors to Kingston with the type of off-road, multi-use pathway experience that the majority of people idealize.

For additional background information on the K & P abandoned railway see Appendix Eight in *Volume Two – Technical Appendices*.

For the purpose of this Study, the approximately 20 metre wide abandoned railway right-of-way is divided into three sections, those being:

- The urban Kingston section of the abandoned railway is located between Kingston City Hall and the crossing of the Little Cataraqui Creek. This linear series of remnant properties is approximately 7 kilometres long. It is discontinuous and will be very challenging, at this point in time, to form the basis of a continuous off-road pathway because, although the majority of the properties are City-owned, parts of the original alignment have been sold by the City.
- The rural Kingston section is located between the crossing of the Little Cataraqui Creek and the Kingston city limit at Orser Road. With the exception of an approximately 160 metre long discontinuity on Jackson Mills Road, this section of the right-of-way is approximately 14.8 kilometres long and could fairly easily form the basis of a continuous off-road pathway. The property is owned by Bell Canada who has offered to negotiate transfer of ownership to the City of Kingston.

- The rural Township of South Frontenac section is located between the Kingston city limit at Orser Road and the junction with the existing Cataraqui Trail near Harrowsmith. This section of right-of-way is approximately 6.2 kilometres long. The property is owned by Bell Canada who has offered to transfer ownership to the Township of South Frontenac.

For additional background see Appendix Eight – *Background on the K & P Abandoned Railway in Volume Two – Technical Appendices.*

This Study recommends that the rural Kingston section of K & P abandoned railway, be developed as an initial project for the following reasons:

- Although located primarily north of the city, the right-of-way is fairly accessible to the urban area of Kingston and the highest concentration of population. The right-of-way represents an untapped resource that has the potential to be enjoyed by many persons.
- At approximately 16 kilometres long, the proposed pathway represents an uninterrupted travel experience for pedestrians, cyclists and cross-country skiers that is significant and worthwhile. Although it would be preferable for users to be able to walk or cycle to the facility via a connecting designated off-road pathway, or on-road cycling facility, the absence of this ideal does not preclude the attractiveness of the facility as a destination unto itself. It is recommended that the south end of the right-of-way be connected via a multi-use pathway under Highway 401 to the existing trailhead and parking lot at the southwest corner of the Little Cataraqui Conservation Area.
- Although it would be ideal for the rural Kingston section of the potential pathway to connect to the Cataraqui Trail and the Trans Canada Trail through the Township of South Frontenac, this connection should be considered a bonus rather than a necessity. This Kingston section of pathway is long and interesting enough to be developed as an independent pathway.
- The K & P abandoned railway right-of-way has the highly desirable potential to be a continuous off-road facility. The two crossings of Highway 401 are the only significant barriers that exist, and there is an opportunity to facilitate these crossings with grade separations, as part of MTO’s current upgrade program. MTO has already agreed to replace the existing railway tunnel under Highway 401.
- Other challenges associated with drainage, concerns of adjacent land owners (noise, litter, potential nuisance, etc.) and costs can be addressed. There is a great deal of support information available through the “Rails to Trails” movement on all of these issues.

Existing Conditions

In December 1998, a detailed inventory of the rural K & P abandoned railway between Sydenham Road and Orser Road, plus a cost estimate to develop the abandonment as a multi-use pathway paved with gravel, was prepared by Doug Knapp, a member of the K & P Interest

Group. Mr. Knapp commented on the existing surface conditions and track width, fencing, culverts, drainage problems, farm crossings and roadway crossings. He identified costs to rectify physical problems on the potential pathway, but also anticipated other costs for items including signage, engineering consultation, parking lot and rest stop development, legal fees, development of a master plan, promotion and annual operating costs.

In the spring of 2003, the abandoned railway right-of-way appears to be in a state similar to that reported in the 1998 inventory. The abandoned railway right-of-way in its present condition requires some imagination to find and follow. Obviously it is not signed, slightly overgrown with adjacent vegetation and the entrance points from crossing roadways are blocked, typically with piles of earth presumably by Bell Canada to address liability concerns. The entrance points are signed “no trespassing”. There is no visible reference to Bell Canada along the right-of-way. Due to its former use as a railway the gravel ballast of the original railbed provides a fairly flat and consistently wide travel surface. There are a number of minor stormwater drainage problems that could be remedied with re-grading, culverts and swale construction. The character of the right-of-way is determined by adjacent land uses that include forests, pastureland, fallow farm fields and rural residential.

Proposed Facility

It is recommended that the City acquire the property associated with the abandoned railway from Bell Canada. The facility should be developed as a multi-use pathway intended for non-motorized recreational travel. The pathway should be a minimum of 3.0 metres wide and be paved with a compacted limestone fines surfacing.

The pathway would be a municipal public pathway, managed no differently than other pathways in the City. A “management board” or other volunteer support groups, though possible, would not necessarily be required. The maintenance and management of the facility would, by necessity, be the responsibility of the City. An acceptable agreement would need to be established between the City and the Cataraqui Region Conservation Authority (CRCA) for access to the trailhead and parking lot within the Little Cataraqui Creek Conservation Area. The CRCA has noted that opening of CRCA lands to pedestrians and cyclists with new facilities would significantly affect their management and revenue generation.

The following summarizes the facilities and requirements required to develop this project, listed from south to north:

1. The City of Kingston must acquire the right-of-way from Bell Canada.
2. The pathway would start at the existing trailhead parking lot located east of the Little Cataraqui Creek Conservation Area reservoir dam. There are washrooms located at this location. The existing grass pathway alignment that connects between the gravel park road and the pathway bridge located north of the creek tunnel would need to be upgraded to a 3.0 metre wide standard and paved with a limestone fines surfacing. The length of this pathway is approximately 620 metres. A pathway / roadway transition is required at the park road.
3. A tunnel crossing under Highway 401 either independent of the existing Little Cataraqui Creek culvert or in association with a new culvert is required. The existing culvert is a

utilitarian drainage pipe supported by rock-filled gabion baskets. A more attractive creek facility would be preferable. If the multi-use pathway and creek flow are facilitated in the same structure there is an opportunity to create an interesting association between the two.

4. The Highway 401 right-of-way is lined on both sides by a 1.8 metre high chain link fence. It is assumed that no additional access control is required to prevent pathway users from going onto this dangerous highway.
5. A truck access “roadway” has been created between the abandoned railway embankment and the Highway 401 right-of-way, presumably by maintenance crews or the installers of highway light standards. It is recommended that this alignment should be upgraded to a 3.0 metre wide pathway standard and paved with a limestone fines surfacing. The length of this pathway is approximately 520 metres. This alignment is located on private property. It will be necessary to secure an easement or acquire a public access right-of-way through this apparently “land locked” property.
6. The construction of a new 3.0 metre wide pathway, recommended to have a top layer travel surface of compacted limestone screenings, will to a certain extent benefit from the granular materials or ballast of the underlying remaining rail bed. However, to ensure a consistent structural base is in place, complete reuse has not been assumed in this costing exercise. The contractor building the pathway should be instructed to reuse existing granular material where the existing material satisfies depth and compaction requirements and to install additional granular materials where it is required. The potential cost saving for reusing approximately one third of the necessary sub-grade granular base has been reflected in this costing exercise. The lengths of required pathways are as follows:

Approximately 240 metres east of the former creek / railway bridge to Brass Drive	530 metres
Brass Drive to Sydenham Road	395 metres
Sydenham Road to McIvor Road	2,530 metres
McIvor Road to Jackson Mills Road	1,280 metres
Bur Brook Road to Cordukes Road	2,000 metres
Cordukes Road to Unity Road	2,540 metres
Unity Road to Orser Road	5,480 metres

Total Length 14,755 metres

7. At each location where the pathway crosses a roadway a transition consisting of painted pavement crossing lines, 6 bollards, warning signage, shoulder grading and minimal restoration is required. There are 5 pathway / roadway crossings and 3 pathway / roadway transitions required.
8. There are existing boulders or piles of earth located at the transition between the abandoned railway and roadways to prevent access by motorized vehicles. These obstructions need to be removed.

9. It is assumed that MTO will be replacing the large concrete railway tunnel under Highway 401 with a steel culvert. Runoff water currently drains south to north through the tunnel. It is assumed that this drainage will be accommodated separate from the pathway “culvert”.
10. Two culverts are required to allow runoff water in drainage swales to cross the pathway on both sides of Highway 401.
11. The CRCA and City, through the forum of the Kingston Wetlands Working Group (KWWG), have discussed the conservation of an unevaluated wetland that is south and east of the intersection of Highway 401 and Gardiner’s Road. The wetland is bisected by the K & P abandoned railway right-of-way, which is occasionally flooded due to beaver activity. The CRCA recommends that the development of the pathway in this vicinity should occur in collaboration with the KWWG. Modifications to the two outlets from the wetland may help to stabilize water levels, thereby improving the ecological function of the area and reducing flooding of the trail.
12. Presumably Jackson Mills Road has assumed the former railway right-of-way. A section of this roadway with gravel shoulders and open ditches is approximately 160 metres long between where the abandoned railway to the south connects to Jackson Mills Road at the intersection of Bur Brook Road. Jackson Mills Road is a low traffic volume rural collector roadway that terminates at a stop sign at Bur Brook Road. Consequently the speed and flow of traffic should be acceptable initially to allow the proposed recreational facility to consist of a designated on-road cycling route. Pedestrians should be directed to travel along the east shoulder. In the future, if conditions warrant more substantial separation between Jackson Mills Road and a formal pathway, it is recommended that pre-cast concrete barriers (also known as New Jersey barriers) or steel beam guide rails be used.
13. Approximately 110 metres of page wire fence is required at a location approximately 650 metres north of Bur Brook Road along the abandoned railway alignment.
14. The ditch on the north side of the rail bed, located approximately 240 metres east of Cordukes Road, needs to be lowered and regraded to avoid runoff water from overflowing onto the pathway. The length of this ditch is approximately 690 metres.
15. Repair the large concrete culvert (2.1 x 3.6 m) located approximately 1,000 metres north of Cordukes Road.
16. Install gates at the farm crossing located approximately 2,450 metres north of Unity Road.
17. Repair two washouts at the large culvert located approximately 2,370 metres south of Orser Road. Swampy conditions may be the result of beavers.
18. A trailhead should be established at Orser Road. A gravel parking lot for approximately 10 cars is recommended. The lot should be contained by timber bollards and pinned pre-cast concrete curb stops.

19. Terminus features should be established within the Little Cataraqui Creek Conservation Area and at Orser Road. These would include orientation signage, benches, a garbage container and bicycle lockups.

Costs

For details on costing see Appendix Seven in *Volume Two – Technical Appendices*.

(Figures below were updated Jan. 14: see: http://www.cityofkingston.ca/pdf/transportation/pathways/Addendum_RevisedCosts-KP.pdf)

Granular base materials, grading and paving	\$486,915
Pathway / roadway crossing facilities	\$39,000
Designation and warning signage	\$30,891
General roadway, ditch and washout repairs	\$8,610
New drainage culverts and culvert repair	\$11,200
New fences and gates	\$4,800
Gravel parking lot at Orser Road	\$12,050
Terminus features at Little Cataraqui Creek C.A. and Orser Road	\$18,000

Total Estimated Capital Cost to the City of Kingston	\$673,327
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2. Upgrade the Waterfront Pathway between the Rideau Trail Trailhead and Portsmouth Village

Summary

Upgrade and make continuous the Waterfront Pathway between the Yonge Street / Union Street intersection (Portsmouth Village) and the King Street West / Front Road (Rideau Trail trailhead). New sections of pathway are required south of Commodore’s Cove, through Lake Ontario Park, the Kingston Psychiatric Hospital and opposite the Bayshore Apartment (Mowat Avenue). Two short sections of boulevard pathway on King Street West and a signalized intersection at Trailhead Place / King Street West are required.

Background

This initial project has the best potential in Kingston to demonstrate the ideal standards of a high-profile multi-use pathway. This project is for the most part an existing facility that is well used but has not been designed to maximize its full potential. It is discontinuous and ill defined as a public facility. Signage is low-key, confusing or nonexistent. First time pathway users might wonder if they are actually trespassing or question where the pathway terminates. At both ends, the pathway simply fails to continue without warning or logic. The objective of this initial project is to develop a continuous public facility that connects the Rideau Trail trailhead parking lot and Portsmouth Village and the Union Street cycling lanes.

In the future, two new pathway alignments could be developed as continuations from the Commodore’s Cove loop. One would be on the south side of King Street West as a continuation of the Waterfront Pathway. This is contingent on obtaining permission to cross

through the Dupont Canada waterfront lands. The other pathway would begin as a short section of boulevard pathway on the north side of King Street West that would then turn north onto the city owned abandoned railway spurline. This future pathway would become a “rails - with - trail” situation, sharing the right-of-way through the Little Cataraqui Creek Valleylands beside the private Dupont Canada spurline. Initially this pathway could terminate at Greenview Drive, or eventually extend north to the Bath Road / Armstrong Road signalised intersection. The rails with trails concept would require input from several parties including the CRCA, Dupont Canada, the Rideau Trail Association and the Ontario Ministry of National Resources due to the provincially significant wetland in the area.

As part of the proposed Trail Head Place development a pathway would connect between the Trail Head Place / King Street West intersection and the existing Rideau Trail trailhead parking lot. This connection, which this Study endorses, would contribute a parking lot and trail head for both the pedestrian-only Rideau Trail and the Waterfront Pathway. A new signalized intersection complete with pedestrian crosswalks would be required at the proposed Trail Head Place / Commodore’s Cove / King Street West intersection.

Existing Conditions

Traveling east to west, the existing pathway begins at the south end of Mowat Avenue. A narrow existing pedestrian bridge provides the crossing over a small inlet. An asphalt pathway makes a connection between the bridge and an asphalt roadway along the shore at the Kingston Psychiatric Hospital. The pathway is apparently intended to follow around the perimeter of an informal automobile parking pier. Broken pavement and a lack of edge railings are noteworthy deficiencies of the pier. Between this parking lot and the termination of the approximately 1.8 metre wide asphalt pathway at the Lake Ontario Amusement Park parking lot, the pathway crosses the Kingston Psychiatric Hospital grounds which is a hilly, parkland / shoreline landscape. It is possible to continue to the west by descending a steep roadway at the Lake Ontario Amusement Park maintenance garage and continuing on a picturesque gravel road through the Park’s camping area. An asphalt pathway and culvert installed in 2003 connect Lake Ontario Amusement Park with the new parkland north of Elevator Bay. This section of 3.0 metre wide asphalt pathway is complete with benches and landscaping. A section of pathway extends south to the Lake and another extends north past the Waterside apartment buildings. This pathway terminates at the King Street West pedestrian sidewalk. Other unconnected sections of pathway are located on the east and west of the Commodore’s Cove residential development. These pathways also terminate at the King Street West pedestrian sidewalk.

Proposed Facility

It is recommended that the City upgrade this continuous section of the Waterfront Pathway to a minimum 3.5 metre wide asphalt multi-use pathway. Project development would include a short but continuous loop pathway around the Commodore’s Cove and a section of designated cycling route on Yonge Street to connect it to the south end of the Union Street cycling lanes project. The following summarizes the necessary development, listed from west to east:

1. Signalize the Commodore’s Cove / Proposed Trail Head Place / King Street West intersection. This would include curb cuts and signalized pedestrian crosswalks.

2. Two new sections of 3.0 metre wide multi-use boulevard pathway adjacent to the existing concrete King Street West south side sidewalk on both sides of Commodore's Cove.
3. A new section of 3.5 metre wide asphalt pavement through the gravel parking lot south of the Commodore's Cove residential development.
4. To maintain the privacy of the Commodore's Cove residential development, it is recommended that a fence and signage be installed to discourage the public from using the private road to access King Street West. It is more likely that the public will attempt to use the Commodore's Cove entry road and use the gravel parking lot to the south as a trailhead. To minimize this temptation it is important to install a signalised crossing of King Street West and make a convenient connection to the existing Rideau Trail trailhead parking lot.
5. A new section of 3.5 metre wide asphalt pathway is required between the west property line of Lake Ontario Amusement Park and the east side of the Park maintenance garage. This pathway is through the wooded camping area.
6. A new section of 4.0 metre wide asphalt pathway and pre-cast concrete retaining wall is required to ascend from the Park maintenance garage to the top of the lake bank, at a maximum slope of 8.3 percent.
7. Remove or pulverize the existing 1.8 metre wide asphalt pathway through Lake Ontario Amusement Park and the Kingston Psychiatric Hospital grounds. Widen the granular base to facilitate the paving of a new pathway to a new minimum width of 3.5 metres.
8. Two new sections of 3.5 metre wide multi-use pathway realignment are required to improve the flow of the facility within the Kingston Psychiatric Hospital grounds. The pathway needs to be less steep and a blind curve needs to be eliminated. Re-grading and lengthening the pathway is required.
9. Provide an alternative to the rough pathway that encircles the short pier that is used informally as a parking lot south of Heakes Lane. The main waterfront pathway should bypass this parking area. A secondary side multi-use pathway is required to encircle the pier. It should have secure, continuous railings at the waters edge. It should be paved with asphalt and be 3.0 metre wide. It will be necessary to reduce the number of parking spaces to widen the pathway right-of-way.
10. Repave the existing Kingston Psychiatric Hospital roadway from the west corner of parking pier to the existing pathway connected to the east. This section of shoreline roadway has a low traffic volume. It is recommended it become a multi-modal roadway where pedestrians, cyclists and motorists share the former roadway. Signage and speed control humps are recommended to slow traffic and communicate this special use area.
11. Remove or pulverize the existing 1.8 metre wide asphalt pathway from the Kingston Psychiatric Hospital road to the pedestrian bridge at the south end of Mowat Avenue. Widen the granular base to facilitate the paving of a new minimum pathway width of 3.5 metres.
12. Replace the existing pedestrian bridge at the south end of Mowat Avenue with a new multi-use pathway bridge that is 4.0 metres wide. It is expected that the existing abutments could be reused and widened appropriately.

13. A new section of 3.5 metre wide asphalt pathway is required from the south end of Mowat Avenue to the south end of Yonge Street. It is assumed that the City has established an agreement to provide public access to the waterfront lands at the Bayshore Apartments. Premium steel fencing is recommended to provide separation between the pathway and Bayshore Apartments.
14. Establish a designated cycling route on Yonge Street between its southern end at Lake Ontario and its intersection with Union Street. It is assumed that pedestrians will filter through the Portsmouth Olympic Harbour and will not require a formal pathway.

Costs

For details on costing see Appendix Seven in *Volume Two – Technical Appendices*.

The summary of costs is as follows:

Granular base materials, grading and paving	\$315,290
Pathway / roadway crossing facilities and traffic signals	\$154,200
Designation and warning signage, plus speed control humps	\$9,888
Replacement pathway bridge	\$140,000
Retaining wall and fencing	\$92,800
Total Estimate Capital Cost to the City of Kingston	\$712,178

3. Upgrade the Waterfront Pathway through Breakwater and Macdonald Parks

Summary

Upgrade the Waterfront Pathway between the King Street West Water Purification Plant and the Barrie Street / King Street West intersection as a high-profile multi-use pathway. (Generally as per the alignment indicated in the *Kingston Waterfront Stabilization Strategy Study*.)

Existing Conditions

A narrow existing pathway follows the Lake Ontario waterfront through Breakwater and Macdonald Parks. It is generally an approximately 1.8 metre wide asphalt pathway except where it skirts around the Kingston General Hospital parking lot where it is surfaced with gravel. The pathway is located on city-owned property except at the Kingston General Hospital parking lot and the Queen’s steam plant. Parks Canada operates the Murney Tower Museum in Macdonald Park.

Apparently both parks are the result of lake fill. The CRCA and the City of Kingston produced the *Kingston Waterfront Stabilization Strategy* in 1997. This report outlines the shoreline stabilization function of these two waterfront parks. It includes a plan showing a continuous multi-use pathway that this Study recommends implementing, with a few exceptions.

This narrow section of waterfront parkland is compromised by the many land uses that are taking place within its current confines. Located immediately south of Queen's University and a number of student residences, the existing pathway is a popular location for walkers and fitness runners. At approximately 1.0 kilometre long it is a worthwhile diversion from King Street West for most cyclists traveling east – west along the often-busy two-lane roadway.

The parking lots for Kingston General Hospital create a year-round flow of pedestrian traffic across King Street West. Crosswalks have been proposed by the City, prior to this Study, on King Street West at Collingwood Street, west of George Street and west of Emily Street.

In Macdonald Park there are two municipal parking lots, intended partially for those visiting the Murney Tower Museum that is operated by Parks Canada. There is a helipad that the waterfront pathway diverts around. West of Breakwater Park is the Water Treatment Plant.

Proposed Facility

Based on the general alignment shown in the *Kingston Waterfront Stabilization Strategy*, it is recommended that a continuous 4.0 metre wide multi-use pathway paved with asphalt be constructed between the Water Purification Plant and the Barrie Street / King Street West intersection. This pathway would snake its way around various waterfront obstacles that exist but would make a more significant impact through this parkland than the existing pathway. A strong, wide and flowing new multi-use pathway will stress the importance of this pedestrian, cycling and in-line skating thoroughfare. It is expected that this will be the busiest section of pathway in Kingston and it must be built in anticipation of this popularity.

The City must negotiate to secure more right-of-way space around the Kingston General Hospital parking lot. The alternatives are reducing the number of parking spaces in the lot or lake fill. The right angle corners that currently exist at the parking lot should not compromise the flow of the pathway.

The pathway should be lighted for night use and have plenty of benches set back from the travel surface of the pathway. There should be a pathway loop at both ends of the main pathway to facilitate back and forth travel over the facilities' approximately 1.0 kilometre length.

The pathway should extend on top of the reservoir at the Water Purification Plant. Security issues need to be resolved with appropriate authorities.

How this section of high-use multi-use pathway makes transitions to continuous facilities to the east and west will be a test of Kingston's vision of a broader Waterfront Trail objective. As explained elsewhere in this Study, the challenge to establish a multi-use pathway through Kingston's downtown waterfront is too great. A long-term pedestrian-only facility between Emily Street and Anglin Bay is proposed as a workable compromise. Eastbound cyclists and

in-line skaters are to be diverted from Macdonald Park into City Park or onto King Street East at an upgraded Barrie Street signalized intersection. Westbound cyclists, pedestrians and in-line skaters are to be diverted to a proposed new signalized crossing at the Collingwood Street / King Street West intersection. This crossing would have been located at Beverley Street further west. However, because of the way King Street West curves, the sight lines at this location are not favourable.

Because of the downtown location and close proximity to student housing, it is recommended that this section of pathway be lit for year round night-use.

Costs

For details on costing see Appendix Seven in *Volume Two – Technical Appendices*.

The summary of costs is as follows:

Removals	\$3,000
Granular base materials, grading and paving	\$178,500
Pathway / roadway crossing facilities and traffic signals	\$138,200
Designation and warning signage	\$2,520
New benches and terminus features	\$38,000
Night lighting	\$136,450
Total Estimated Capital Cost to the City of Kingston	\$496,470

4. Upgrade the Waterfront Pathway between Anglin Bay and River Street

Summary

Upgrade and make continuous the Waterfront Pathway between the existing Bay Street parking lot pathway (60 metres east of the King Street East cul-de-sac) and River Street as a high-profile multi-use pathway. A new section of pathway will be immediately adjacent to the future Wellington Street Extension. A new section of pathway will be required through Emma Martin Park and the River Street Main Pumping Station.

Existing Conditions

A series of narrow, discontinuous and unpaved pathways follows the Inner Harbour waterfront through a number of Kingston parks. The St. Lawrence Marina and the city-owned parking lot located north of Bay Street interrupts the continuity of the public right-of-way. Because of the requirement to dock high-masted sailing boats at St. Lawrence Marina, it is not possible to bridge the channel to Anglin Bay with a multi-use pathway bridge. This determines that the pathway right-of-way must be squeezed between the marina west property line and Wellington Street, which is currently a gravel roadway. In the future, Wellington Street is to be upgraded, urbanized and extended north to make a connection to Montreal Street. It is important that a substantial pathway right-of-way is maintained through this constrained area in the planning of the Wellington Street Extension.

A representative example of how the Bay Street parking lot perimeter could be addressed is the urban streetscape located between the south shoreline of Anglin Bay and the residential condominium development to the south. This existing multi-use pathway forms the public interface with the adjacent residential condominium development. This strip of waterfront parkette dead-ends at a chain link fence on the Ministry of National Defence property.

All of the existing pathways through D.R. Fluhrer Park, Riverview Park and Molly Brant Park are substandard. Their asphalt surfaces should be pulverized and incorporated with existing granular base materials to make up part of the widened new pathway base.

Proposed Facility

The new multi-use pathway facility would have two standards. South of the D.R. Fluhrer Park parking lot the pathway will need to fit within a public right-of-way that will, by necessity, be as narrow as possible. North of the D.R. Fluhrer Park parking lot the pathway will be more conventional.

Between the north dead-end of King Street East and the east side of the D.R. Fluhrer Park parking lot the 3.5 metre wide multi-use pathway will need to fit within a compact public right-of-way that is expected to be a minimum of 10 metres wide wherever possible, and 5 metres wide over short, unavoidable sections. This will take the pathway along the east and north sides of the Bay Street public parking lot and the west and north sides of the St. Lawrence Marina property. The alignment should be primarily hard surface with shade trees provided in generously deep and irrigated tree wells. The 3.5 metre travel surface should be well defined and under no circumstances be obstructed by signage or site furniture.

This section of pathway should be lighted for night use and have plenty of benches set back from the travel surface of the pathway. The flow of the pathway should not be compromised by the right angle corners that currently exist at the parking lot.

Between the east side of the D.R. Fluhrer Park parking lot and Cataraqi Street the new pathway would follow the alignment of the existing pathways. Between the asphalt pathways in Riverview Park and Molly Brant Park there is a section of informal gravel pathway located quite near the shoreline. The City should investigate the flood line to determine at what elevation a pathway should be built to avoid being flooded. The pathway may need to be elevated on an armour stone or pre-cast concrete retaining wall. Alternatively the City would need to acquire additional, adjacent parkland further inland. To facilitate a wider pathway through Molly Brant Park cut and fill grading may be necessary.

A pathway / roadway crossing is required at Cataraqi Street and at the vehicular entrance to the St. Lawrence Marina. Pathway / roadway transitions at the King Street East cul-de-sac, the D.R. Fluhrer Park parking lot and River Street are also required.

It will be necessary to alter the chain link property line fencing at the Main Pumping Station on River Street to open up the waterfront to public access. Security issues need to be resolved with appropriate authorities.

The City should have some idea when it will be able to extend this multi-use pathway further north to Belle Island Park before it creates a dead-end at River Street. An informal parking area and a turn-around loop at River Street are recommended as short-term requirements. A permanent trailhead and parking lot are recommended to be located at the southwest corner of Belle Island Park. The City will be criticized for encouraging trespassing onto the two private properties north of River Street if it does not plan the future extension phases.

Costs

For details on costing see Appendix Seven in *Volume Two – Technical Appendices*.

The summary of costs is as follows:

Granular base materials, grading and paving	\$195,840
Parking lot improvement – curbs and trees	\$42,550
Pathway/roadway crossing facilities	\$16,200
Terminus features	\$18,000
Shoreline stabilization	\$75,000
Fencing	\$6,800
Designation and warning signage	\$2,520
Total Estimated Capital Cost to the City of Kingston	\$356,910

5. Establish multi-use pathway and cycling route between Barriefield Village and Butternut Creek

Summary

Establish a boulevard multi-use pathway along Highway 15 between the north end of Barriefield Main Street and the Barrett Court/ Highway 15 intersection. Three residential driveway crossings are required. Establish a crossing of Highway 15 at a future signalized intersection at Barrett Court. Establish a designated cycling route on Barrett Court, Barriefield Main Street and James Street.

Existing Conditions

The west side of the Highway 15 right-of-way between the north end of Barriefield Main Street and the Barrett Court/Highway 15 intersection is approximately 590 metres long. Highway 15 is a two-lane roadway with narrow paved shoulders. It is a rural section (no barrier curbs) of arterial road. It connects Highway 2 and traffic associated with Canadian Forces Base Kingston with Highway 401 to the north. The purpose of this proposed pathway is to connect historic Barriefield Village to the Butternut Creek valley and the developing residential neighbourhoods of Kingston East. It is intended as a less demanding travel experience than Highway 15. Once developed it should provide views across Kingston Inner Harbour to Belle Island. There is an existing sidewalk on the north side of Barrett Court. There is a fairly steep hill on James Street

in Barriefield Village. At the west end of James Street there is informal parkette with a road that accesses the Inner Harbour shoreline.

Proposed Facility

A 3.0 metre wide, two-way boulevard multi-use pathway paved with asphalt is proposed. The pathway would need to be located at the west edge of the Highway 15 right-of-way and separated from the highway travel surface with as much distance as possible. It is proposed that pre-cast concrete curb stops be installed between the pathway and the highway shoulder. This will prevent motor vehicles from driving on the pathway.

Reflective roadway edge markers, mounted on metal posts, should be installed along the line of curb stops to prevent the curb stops from being a trip hazard to pedestrians and being hit by snow ploughs.

Pathway/roadway crossings with painted pavement crossing lines, six bollards, warning signage and pavement repair are required at three residential driveways on the west side of Highway 15.

Designated cycling routes on James Street and Main Street in Barriefield Village and on Barrett Court are proposed.

Costs

For details on costing see Appendix Seven in *Volume Two – Technical Appendices*.

The summary of costs is as follows:

Granular base materials, grading, paving and repairs	\$67,860
Curb stops and edge markers	\$21,430
Pathway/roadway/driveway crossing facilities	\$27,000
Designation and warning signage	\$8,742
Total Estimated Capital Cost to the City of Kingston	\$125,032

Utilitarian Cycling Focus Facility Projects

1. Union Street Cycling Route / Cycling Lanes

Summary

Formalize the Union Street cycling facility from Barrie Street to King Street West.

Existing Conditions

Union Street is a two-lane collector road with pavement widths ranging from approximately 9.0 to 14.0 metres from Barrie Street to King Street West. Average annual daily traffic volumes (AADTs) range from 5,000 to 11,500. Currently, an informal cycling route runs from Frontenac Street on the east, to the Union Street entrance for Queen's University West Campus, just west of Sir John A. Macdonald Blvd. Non-standard cycling lanes are located along the north and south sides of Union Street. They are non-standard in that they do not maintain a consistent lane width throughout, they are not regularly maintained and they do not have standard cycling lane signage or pavement markings.

Since Union Street runs through the heart of Queen's University, there is a high volume of pedestrian and cycling activity. From Barrie Street to University Avenue, on-road parking exists on both the north and south side of Union Street.



Union Street looking westbound, east of University Ave.



Union Street looking eastbound, east of University Avenue. Note the on-road parking along the north and south curbs.

Proposed Facilities

The City of Kingston should designate the portion of Union Street, from Barrie Street to King Street, as a cycling route by formalizing and upgrading the existing facility to the typical form

and facility design standards outlined within this document. Public perception is that the existing Union Street cycling lanes are one of the few on-road cycling facilities within the City of Kingston. By upgrading the existing facility to recognized standards, the City will demonstrate a new and improved standard for cycling lanes in Kingston.

From Barrie Street to University Avenue: Pavement widths, as outlined above, are approximately 14.0 metres wide. This is sufficient to accommodate on-road parking along the north and south curb (currently 2.2 metres wide but could be reduced to 2.0 metres), two lanes of traffic (3.5 metres/lane) and 1.5 metre cycling lanes between the parked vehicles and the corresponding lane of vehicular travel.

From University Avenue to Frontenac Street: Pavement widths are approximately 12.3 metres wide. Parking is not permitted on either side of the roadway. The existing pavement width will accommodate two lanes of traffic (4.35 metres / lane), a 1.8 metre cycling lane along the south curb (for the eastbound direction of travel) and a 1.8 metre cycling lane for the westbound direction of travel.

From Frontenac Street to Queen's University West Campus Entrance: Although pavement widths along this segment vary, there is generally sufficient width to accommodate cycling lanes in both directions in conjunction with two lanes of traffic. On-road parking along this section does not currently exist and cannot be accommodated within the proposed configuration.

From Queen's University West Campus Entrance to King Street/Mowat Avenue: Pavement widths along this section vary, ranging from 9.0 to 10.0 metres. On-road parking along this section should not be permitted given the limited existing pavement width. It is recommended that this portion of roadway, at least initially, be designated as a shared use cycling route facility where cyclists and motorists utilize a common lane of travel (as it currently exists). If in the future, when roadway improvements along this segment are warranted, consideration should be given to widening this segment to a cross section that will accommodate two lanes of automobile travel and cycling lanes in both directions.

Costs

Preliminary cost estimates associated with this project are approximately of \$60,000. This includes \$57,000 for the segment between Barrie Street and the Queen's West Campus entrance (cycling lanes) and \$3,000 for the section between the Queen's West Campus Entrance and King Street West (shared use facility). These estimates do not include any potential future costs associated with widening the western segment of roadway from Queen's West Campus entrance to King Street West.

Detailed cost estimates are included in Appendix Seven in *Volume Two – Technical Appendices*.

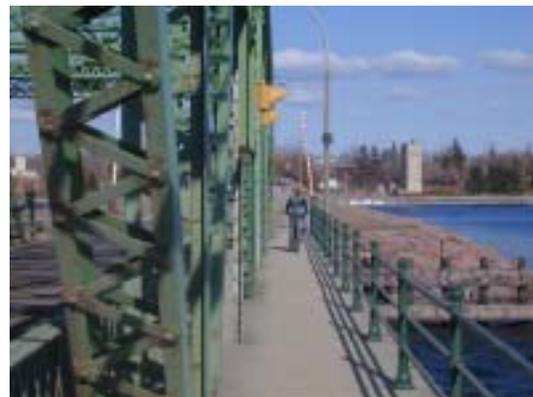
2. La Salle Causeway Cycling Priority Multi-Modal Roadway

Summary

Establish a designated “cycling priority” facility on the La Salle Causeway between Place D’Armes and the Highway 2 / Highway 15 intersections. This would require permission from the Federal Government as they control the Causeway.

Existing Conditions

The La Salle Causeway is currently the only roadway link within the urban area that crosses the Kingston harbour / Cataraqui River connecting the downtown area to the eastern portion of the City. As stated earlier, Highway 401 is restricted to cyclists. Many cyclists view the La Salle Causeway as a critical utilitarian link that is often an intimidating section of roadway to travel – especially for less experienced cyclists. Not only is motor vehicle travel significant (approximately 20,000 AADT), the narrow road width (7.0 metres) and surface materials (metal grating over the lift bridge structure) make this section, at least from a cycling perspective, a challenge.



La Salle Causeway looking eastbound. Note that the cyclist in the left photo has the confidence to utilize the travel portion of the roadway. The cyclist in the right photo avoids the Causeway choosing instead to cycle on the sidewalk, which is illegal.

Highway 2, west of Highway 15, is a two-lane arterial road with a pavement width of approximately 7.5 metres. The posted speed limit is 60 km/hr. The cross-section includes curb and gutters on both sides, plus wide soil/gravel shoulders. A sidewalk exists on the south side of the roadway south of the existing soil/gravel shoulder.

West towards the Causeway, total mid-block pavement width ranges from 8.8 metres to 8.2 metres immediately east of the steel lift bridge structure. The steel grate structure has a travel surface width of just less than 7.0 metres, or less than 3.5 metres in both directions. Immediately west of the structure, the surface pavement width increases to approximately 8.5 metres in total.



The above photos illustrate Highway 2, just west of Highway 15. The above left photo is looking eastbound towards Highway 15. The above right photo is looking westbound towards the La Salle Causeway. Note the steep grades and gravel shoulder.

There are limited cost effective measures that will address the above concerns. Ultimately, a third crossing, and/or an improved/widened Causeway, with dedicated cycling lanes, is recommended. In the short-term, the establishment of a cycling priority, multi-modal road designation, could alleviate some of the existing concerns and bring cyclists to the attention of motorists who share the same facility.

Proposed Facility

Traffic volumes along this portion of Ontario Street / La Salle Causeway are approximately 20,000 AADT. Based on current design guidelines, a shared-use cycling route facility is not recommended. Exclusive-use cycling lanes (1.5 to 2.0 metres wide) would be more appropriate. Due to unique physical characteristics and challenges surrounding this roadway segment, however, cycling lanes cannot be accommodated (the current surface width of the Causeway lift bridge structure is 7.0 metres).

In the short-term, the City of Kingston should attempt to lessen the impacts of these existing deficiencies by increasing motorist awareness. In addition to appropriate signage, “**CYCLING PRIORITY**” pavement markings are recommended on either side of the Causeway structure in consultation with the Federal Government. These pavement markings should be situated immediately on either side of the Causeway structure, 50 to 100 metres east of the Causeway structure in the westbound lane of travel and 50 to 100 metres west of the Causeway structure in the eastbound lane of travel. This will provide increased awareness to motorists allowing them sufficient time to react to cyclists and the unique roadway conditions they are about to encounter. It is recommended that these pavement markings should follow the guidelines established in the Transportation Association of Canada’s *Manual of Uniform Traffic Control Devices*.

The City of Kingston should avoid formally designating the La Salle Causeway as a cycling facility until such time that the appropriate cycling facility design standards can be implemented. The City will need to approach and work with the Federal Government since the Causeway is under their jurisdiction.

Costs

Preliminary cost estimates associated with these short-term improvements are approximately \$9,000. Longer term cost estimates associated with a third crossing or an improved/widened La Salle Causeway were not undertaken due to several unknown variables.

Detailed cost estimates are included in Appendix Seven in *Volume Two – Technical Appendices*.

3. King Street West (Portsmouth Village) Cycling Route

Summary

Establish designated shared-use cycling facilities on King Street West between Portsmouth Avenue and Gardiner Street.

Existing Conditions

From Gardiner Street to McDonald Avenue, King Street West is a two-lane arterial road with pavement widths ranging from 11.7 metres at Gardiner Street to 8.6 metres just west of Church Street. An eastbound left turn lane exists at the Mowat Avenue/Union Street intersection with King Street.

Within Portsmouth Village, several heritage buildings and churches limit the available right of way space for potential roadway widening.

From McDonald Avenue to Portsmouth Avenue, King Street West widens to a four-lane cross section and eventually to a five-lane cross section at the King Street West/Portsmouth Avenue intersection. The fifth lane represents a left turn auxiliary lane. Pavement widths along the four-lane section are approximately 14.5 metres.

Proposed Facility

The City of Kingston should designate the portion of King Street West, from Gardiner Street to Portsmouth Avenue, as a shared-use cycling route facility. The City should maintain existing parking restrictions along this section of roadway.

Minimum road widths for a shared-use cycling route facility are available from Gardiner Street to McDonald Avenue (i.e. minimum 4.25 metre wide outside curb lanes). Pavement widths from Gardiner Street to Portsmouth Avenue, however, are deficient in terms of meeting the minimum shared-use cycling route standard. The south side of this portion of roadway would require widening in order to meet the minimum curb lane width of 4.25 metres.



King Street West looking westbound at Gardiner Street. Note the cyclist and debris in the defacto cycling lanes.



King Street West looking eastbound, just east of McDonald Avenue.

Costs

Preliminary cost estimates associated with these improvements, including the widening of the south side of King Street West, between Portsmouth Avenue and McDonald Avenue, are estimated to be approximately \$44,000.

Detailed cost estimates are included in Appendix Seven in *Volume Two – Technical Appendices*.

4. Centennial Drive Designated Cycling Facility

Summary

Infill sections of cycling lanes on Centennial Drive to establish a continuous cycling lanes facility from Gardiners Road to Bath Road.

Existing Conditions

Currently, there are three discontinuous Centennial Drive roadway segments. They are described as follows:

- The most northern segment exists from Gardiners Road to 500 metres east of Gardiners Road;
- The central segment exists from 400 metres north of Princess Street (entrance to King's Landing/Costco) south to Taylor Kidd Boulevard; and
- The southern segment exists from Kingsdale Drive / Fernmoor Drive south to Bath Road.

Furthermore, there are two design / Environmental Assessment studies currently underway that will improve the connectivity of Centennial Drive. They are described as follows:

- Crossfield Avenue to 160 metres north of Princess Street: 1.5 metre wide cycling lanes are proposed by the design consultant; and
- Taylor Kidd Boulevard to Bath Road: 1.5 metre wide cycling lanes are proposed by the roadway design consultant (2.5 metre wide cycling lanes over the CN railway structure).

The remaining segment, from 500 metres east of Gardiners Road to Crossfield Avenue, will be completed as development of the Cataraqui North community continues.

Proposed Facility

It is recommended that the City of Kingston designate Centennial Drive, from Gardiners Road to Bath Road, as a cycling facility. The City should capitalize on the two studies that are currently being finalized and implement 1.5 metre wide cycling lanes on all existing and unfinished segments of Centennial Drive. Once complete, Centennial Drive will provide excellent utilitarian cycling connectivity between the Cataraqui Industrial Park / residential community and Bath Road. Bath Road is a major east/west link in the proposed Facility Network. Furthermore, a designated facility on Centennial Drive would also provide connectivity to recreation facilities, such as the proposed K & P trail, to the north.

Costs

Cost estimates associated with these improvements are estimated to be \$55,000. These estimates do not include costs associated with the implementation of the cycling facilities proposed within the two studies currently underway.

Detailed cost estimates are included in Appendix Seven in *Volume Two – Technical Appendices*.

5. Ontario Street Designated Cycling Facility

Summary

Designate Ontario Street, from West Street to Place D'Armes, as a cycling facility. Improve the transition between Ontario Street and the potential future Wellington Street extension.

Existing Conditions

There are several on-going studies within the City of Kingston that will have a direct impact on the role of Ontario Street as a cycling facility.

The *North Block Central Business District Study* is examining several potential scenarios for redevelopment in the downtown core. The study area consists of four and one-half city blocks

in the northern part of the downtown. This area includes Ontario Street to the east, Place D'Armes to the north, Wellington Street to the west and a one-half block south of Queen Street.

The *Downtown Action Plan* is a precursor to the proposed program to replace underground utilities in downtown Kingston. The *Downtown Action Plan* will focus primarily on above ground infrastructure including signage, lighting, sidewalks, pavement materials, etc. The study's preliminary recommendations encourage better connectivity northward to the four-block area and westward to the Division Street and Princess Street areas. Consideration is being given to the closure of Ontario Street to motor vehicle traffic in front of City Hall.

The *Transportation Master Plan* is currently examining long-range transportation solutions for all modes of travel within the city. A reoccurring issue being evaluated is the need for additional east-west vehicular capacity across the Cataraqui River. The study includes a focus on the downtown core as it relates to traffic, parking, transit, pedestrians and cycling.

Proposed Facility

The City of Kingston should designate Ontario Street, from West Street to Place D'Armes, as a cycling facility. It is premature at this time to specify exactly what facility type is most appropriate given there are several studies being undertaken that will determine the future form of the downtown. The City should, however, ensure that cycling facilities are fully considered and implemented into future downtown design concepts impacting Ontario Street. Given the high potential for both recreational and utilitarian cycling, as well as the presence of several high-profile institutional land uses along this roadway, the City should consider implementing designated cycling lanes on Ontario Street. Should the *Downtown Action Plan*, or any study for that matter; result in the closure of vehicular traffic on any portion of Ontario Street, cyclists should not be restricted from utilizing this portion of roadway.

Costs

Given that the on-going studies are in the early stages of their process, cost estimates for cycling-related improvements may be premature. At current conditions the costs associated with implementing cycling lanes along this section would be approximately \$40,000.

Detailed cost estimates are included in Appendix Seven in *Volume Two – Technical Appendices*.

6. Division Street Designated Cycling Facility

Summary

Establish designated cycling facilities on Division Street between Highway 401 and Elliott Avenue. As part of the reconstruction of Highway 401, encourage the Ontario Ministry of Transportation (MTO) to widen the Division Street curb lanes under the Highway 401 structure.

Existing Conditions

Division Street, from Highway 401 to Elliott Avenue, is a four-lane arterial road with an urban cross section. Pavement widths along this section generally range from 13.3 to 13.5 metres at spot locations sampled during field visits. Left turn auxiliary lanes exist at several, but not all, intersections. On-road parking is not permitted along this section.

On the east side of Division Street, from Benson Street to Weller Avenue, there are a number of driveways providing access to a variety of retail commercial uses, restaurants and gas stations. On the west side there are a number of vacant, undeveloped parcels of land.

North of Highway 401, Division Street becomes Perth Road, which proceeds past the Little Cataraqui Creek Conservation Area and is a well-recognized cycling route to the north.

The Highway 401 overpass has closely spaced abutments (short span structure) that limit the overall pavement surface widths under the structure to four lanes. As a result, the narrow Division Street / Highway 401 overpass is viewed as a constriction to cycling.

Proposed Facility

Division Street is viewed as a key utilitarian route as it provides good north/south connectivity from the Rideau Heights and Markers Acres area to Queen's University and the downtown core. The Little Cataraqui Creek Conservation Area to the north is also a popular destination for recreational cyclists and pedestrians.

Design year average annual daily traffic volumes (AADTs) along this segment are approximately 20,000. Design guidelines suggest that either wide curb lanes (4.9 metres wide) or dedicated cycling lanes (1.5 metres wide) are warranted along this section of roadway.

As the vacant parcels on the west side of Division Street develop, there could be increased friction between by additional accesses (depending on the development scheme). As this development continues, through traffic on Division Street could experience increased delay, as motorists will tend to slow down or stop in the through lane prior to making their turning manoeuvre. The need for auxiliary lanes, or possibly a centre two-way left turn lane, may increase. This section of Division Street could require widening to accommodate auxiliary lanes. If development proceeds in such a way that would result in Division Street requiring widening, sufficient pavement width should be reserved for either a shared-use cycling route facility or cycling lanes.

The City of Kingston should encourage MTO to widen the Division Street curb lanes under the Highway 401 structure, or increase the space between the abutments to accommodate cycling facilities. Furthermore, the City should review pavement widths along the CN rail overpass, south of Weller Avenue/north of Counter Street; to ensure that adequate pavement widths exist. If adequate pavement widths do not exist, the City should consider accommodating these widths in future capital projects involving the CN rail structure.

Costs

Cost estimates associated with these improvements are estimated to be \$580,000 for the implementation of a shared-use cycling route facility or \$615,000 for the implementation of cycling lanes. These estimates include costs associated with widening Division Street but do not include costs associated with modifications to the Highway 401 or CN rail structures.

Detailed cost estimates are included in Appendix Seven in *Volume Two – Technical Appendices*.

4.5.2 Description of Potential Long-Term Projects

Pedestrian Focus

1. Establish a continuous public access way between Macdonald Park and Simcoe Street. A new public right-of-way and pathway is required to provide access between Emily Street and Maitland Street. This project would require consideration of both natural hazards (flooding, erosion, ice) and environmental impacts (impact on aquatic habitat). As part of the implementation of this long-term project, the City is encouraged to avoid filling into Lake Ontario. Fisheries and Oceans Canada, the Ontario Ministry of Natural Resources or CRCA staff does generally not support this. The pathway could be supported on piles or cantilevered from the shore. This type of design would have a lesser impact and would be reviewed more favourably by the responsible approval agencies. Secure an easement with the Kingston Yacht Club for access between Maitland Street and Simcoe Street.
2. Establish a continuous public access way between the South side of Ontario Street (Fort Frontenac) and the multi-use pathway located on the south side of Anglin Bay. Secure an easement with the Federal Government (Ministry of National Defence). This high-profile waterfront property should have a significant public use.
3. Continue the formalization of the “East Kingston Single Track Trail” east of Gates Boulevard, ideally all the way to Trillium Drive. Secure easements with private landowners.
4. Develop a low impact walkway between Hawthorn Cottage / Pittsburgh Library and the Highway 15 commuter parking lot along the east side of the Great Cataraqui River. Satisfy concerns of environmental protection authorities.

Recreational Focus

1. Establish a primarily off-road facility, made-up for the most part with multi-use pathways, between the rural Kingston portion of the K & P abandoned railway and the Lake Ontario Waterfront Trail. There are a number of possible alternatives. This project is contingent on the development of the rural Kingston portion of the abandoned railway being developed as a pathway.

- A. The most direct alignment alternative is one through the Little Cataraqui Creek Valley. This alignment is envisioned with the following significant facilities and requirements.
- A - 1. Accommodation of a multi-use pathway under the future Cataraqui Woods Drive / Dalton Avenue roadway bridge over the Little Cataraqui Creek.
 - A - 2. Secure a public right-of-way or easement through the private lands on the north side of Counter Street, west of the Little Cataraqui Creek.
 - A - 3. Establish a grade separated crossing of the CNR mainline and Counter Street. Ideally this facility would cross both of these pathway travel barriers.
 - A - 4. Secure a public right-of-way or easement through the private lands on the south side of Counter Street, west of Portsmouth Avenue.
 - A - 5. A bridge and boardwalk is required through the floodplain on property described above.
 - A - 6. Tree removal and a boardwalk are required between the Parkway cul-de-sac and the north end of Queen Mary Road.
 - A - 7. A continuous sidewalk and designated on-road cycling facilities on Parkway, Queen Mary Road and Greenview Drive.
 - A - 8. A “rails with trail” multi-use pathway in association with the Dupont Canada spurline between Glenview Drive and Auld Street.
- B. A western alignment alternative is one partially through the valley of the West Branch of the Little Cataraqui Creek. This alignment is envisioned with the following significant facilities and requirements.
- B - 1. A continuous sidewalk and designated on-road cycling facility on Centennial Drive between the rural portion of the K & P abandoned railway and Crossfield Avenue.
 - B - 2. Signalization of the Centennial Drive / Crossfield Avenue intersection and the Taylor-Kidd Boulevard / Old Colony Road intersection.
 - B - 3. At least three pathway bridges over the West Branch of the Little Cataraqui Creek.
 - B - 4. Alterations and enlargement of the existing Princess Street culvert to accommodate a lighted multi-use pathway.
 - B - 5. A retaining wall and potential stream realignment north of the Taylor-Kidd Boulevard / Old Colony Road intersection.
 - B - 6. Lengthen the existing culvert under Development Drive to facilitate the existing sidewalk, a new boulevard pathway and associated railings / guard rails.

- B - 7. A pedestrian-activated traffic signal at the crossing of Bath Road opposite the proposed CNR railway at-grade pathway crossing.
 - B - 8. Replace the existing 1.2 metre wide pedestrian bridge from Canterbury Crescent with a 3.5 metre wide multi-use pathway bridge.
 - B - 9. A continuous sidewalk and designated on-road cycling facility on a number of streets through the Henderson Place and Lakeland Acres neighbourhoods.
 - B - 10. Upgrade the existing pathway through Welbourne Park and Welbourne Avenue School. Ensure that school children are adequately buffered from pathway users.
- C. An eastern alignment alternative is one following the urban Kingston portion of the abandoned railway. This alignment is envisioned with the following significant facilities and requirements.
- C - 1. A pathway bridge over the Little Cataraqui Creek is required. It is assumed that the former railway bridge abutments could be reused.
 - C - 2. Secure a public right-of-way or easement through the private lands east and west of the Dalton Avenue / Sir John A. Macdonald Boulevard intersection.
 - C - 3. A continuous sidewalk and designated on-road cycling facilities on St. Remy Place, between the Canadian Waste facility gate and the abandoned railway. Special consideration must be given to the frequent truck traffic on this roadway.
 - C - 4. An opening in the sound attenuation wall south of Division Place.
 - C - 5. A grade-separated crossing of the CNR mainline is envisioned as a 3.5 metre wide pathway structure attached to the east side of the Division Street roadway bridge.
 - C - 6. Secure a public right-of-way or easement through the private lands that were previously abandoned railway lands, between Elliott Avenue and the southwest corner of Belle Park.
 - C - 7. Upgrade the existing crosswalks at signalized intersections at Dalton Avenue / Sir John A. Macdonald Boulevard and Montreal Street / Railway Street / Rideau Street in consideration of their increased importance as multi-use pathway crossings.
 - C - 8. Secure a public right-of-way or easement through the private former tannery lands and the waterfront property north of River Street.
2. Establish a continuous off-road multi-use pathway through the Butternut Creek Valley. Land developers or the federal government through the Ministry of National Defence owns the lands associated with this potential facility. Negotiations to secure public rights-of-way

or easements are required. This project would take emphasis away from the boulevard pathways that have been established along Highway 15.

3. Establish a continuous off-road multi-use pathway through the West Branch of the Little Cataraqui Creek valley between Front Road and Counter Street. The lands associated with this potential facility are owned by land developers, the federal government through Public Works Canada or the CRCA. Negotiations to secure public rights-of-way or easements are required. The section of proposed pathway between Malabar Drive and Princess Street is currently an informal pathway. The local community association has expressed interest in formalizing this alignment. Accommodation of a multi-use pathway under the future Centennial Drive roadway bridge is required.
4. Establish a continuous off-road multi-use pathway through the private Dupont Canada lands, Patterson Park and the Front Road Sewage Treatment Plant. Negotiations with Dupont Canada to secure public rights-of-way or easements are required. This project would maximize the off-road extent of the Lake Ontario Waterfront Trail. A boulevard pathway on the south side of Front Road along the Cataraqui Bay waterfront is also required. Shoreline stabilization and potentially lake fill are required to create a stable pathway right-of-way between Front Road and Cataraqui Bay.

Utilitarian Cycling Focus

Any opportunity to establish designated cycling facilities on roadways identified on the Urban Area – Utilitarian Cycling Focus master plan should be pursued. Long-term objectives would include the following:

1. Establish the continuous designation of the Ontario Bike Route Network. This would require the establishment of cycling facilities on specific sections of Bath Road, Bayridge Drive, Front Road, King Street, Ontario Street and Highway 2 for the east-west alignment and County Road 10 (Perth Road) and Division Street for the north-south alignment.
2. The establishment of designated cycling facilities on Princess Street and Bath Road between Division Street and Collins Bay Road will be challenging because of the high traffic volume, commercial adjacent land uses and high profile associated with these roadways. Kingston will need to have a number of years of experience implementing successful on-road cycling facilities before it tackles this central arterial.
3. It is assumed there will be opportunities to provide designated cycling facilities on all future arterial roadways that are to be built in Kingston. The future Cataraqui Woods Drive, Centennial Drive, Wellington Street Extension and the “third crossing” Great Cataraqui River bridge crossing should all be designed with utilitarian cycling in mind.

4.6 Policies

4.6.1 Official Plan Amendments

Current Policies

The following documents were reviewed to gain an understanding of the policies presently in place in the City of Kingston:

- Official Plan, City of Kingston Planning Area (July 1991);
- Official Plan of the Township of Kingston (November 1997);
- The Official Plan of the Pittsburgh Planning Area (January 1996); and
- Amendment No. 59 to the Official Plan of the Pittsburgh Planning Area (Currently before MMAH for approval).

Official Plan, Former City of Kingston Planning Area

The following is a list of applicable policies from the former City of Kingston Official Plan:

PART III: GENERAL DEVELOPMENT, REDEVELOPMENT AND CONVERSION PRINCIPLES

- 3.10.3 - Urban Design Policies [especially (a) Ease of Access]
- 3.14.2.2 - Bicycle Parking Areas
- 3.15 - Elevated Pedestrian Walkways

PART IV: LAND USE POLICIES

- 4.24 - Transportation Corridor Policies [especially 4.24.1 General Statement & 4.24.5 (h) (development of public facilities, including pathways, adjacent to transportation corridors)]

PART VI: TRANSPORTATION POLICIES

- 6.1- General Statement
- 6.2- Objective
- 6.3- General Transportation Policies
- 6.4.7.3- Roadway Design
- 6.6- Non-motorized Travel
- 6.10.4- Rail Lines and Service (abandoned rail rights-of-way)

PART VII: PLANNING PROGRAM INITIATIVES

- 7.6.2(a)(iii) - Tourism - Policies – Public Facilities

The Official Plan of the former City of Kingston makes a number of policy statements concerning "non-motorized travel" in Section 6: Transportation Policies, Subsection 6.6. The statements relate to two general areas:

- Development of a comprehensive strategy for pedestrian, cycling, or other forms of non-motorized travel; and
- Designation and development of pathways on City streets, laneways and public open space to allow travel within the City in a safe and convenient manner.

Official Plan of the former Township of Kingston

The following is a list of applicable policies from the former Township of Kingston Official Plan:

SECTION 1 - BASIS OF THE PLAN

- 1-3.1.4 – The Vision – Linkages

SECTION 2 – GENERAL POLICIES

- 2-3.2 – Community Design Principles
- 2-5 – Where We Play
- 2-6.1 – Transportation Policies

SECTION 4 – SECONDARY PLANS

- 4-2.1.2(5) – Goals
- 4-2.5 – Open Space
- 4-2.5.4 – Peopleways
- 4-2.8 – Transportation Policies

SECTION 5 – INFRASTRUCTURE

- 5-2.5 – Shoreline Areas/Waterfront Lands
- 5-2.6 – Rideau Trail
- 5-5 – Transportation
- 5-6(6) – Parking Areas

The Official Plan of the Township of Kingston addresses cycling policy in a number of sections of the Official Plan. In general, the policies point towards encouraging cycling and developing a transportation network that accommodates cycling needs.

The Official Plan of the Pittsburgh Planning Area (including Amendment No. 59)

The following is a list of applicable policies from the former Township of Pittsburgh Official Plan as amended by Amendment No. 59:

SECTION 2 – LAND USE

- 2F – Open Space & Pathways

SECTION 3 - URBAN PLANNING AREAS

- 3B – Rideau Community Planning Area
 - 3B.1.8 through 3B.1.11 (Rideau Planning Area Objectives)
 - 3B.4 – Open Space, particularly:
 - Introductory section (3B.4)
 - 3B.4.1.1 & 3B.4.1.3 (from Objectives)
 - 3B.4.2.3 & 3B.4.2.4 (from General Policies)
 - 3B.4.3 – Special Policy Areas
 - 3B.4.3.1 – Great Cataraqui River Shoreline & Butternut Creek Corridors
 - 3B.4.3.2 – Highway No. 15 Corridor
 - 3B.4.3.3 – Riverfront Park
 - 3B.6 Neighborhood Centre
 - 3B.6.2.16 (Policies)
 - 3B.7 – Village Centre
 - 3B.7.1.2 (Objectives)
 - 3B.7.2 – Policies
 - 3B.7.2.5
 - 3B.7.2.8
 - 3B.7.2.9
 - 3B.7.2.10
 - 3B.13 – Transportation & Parking
 - 3B.13.1 – Objectives
 - 3B.13.1.2
 - 3B.13.1.3
 - 3B.13.1.5
 - 3B.13.2 – Policies

- 3B.13.2.9
- 3B.13.2.10
- 3B.13.2.18

SECTION 4 – INFRASTRUCTURE

- 4A – Transportation
 - 4A.1 – Objectives
 - 4A.4 – Pathways

The Official Plan identifies a number of objectives for the transportation network, including:

- the need to accommodate various modes of transportation (automobiles, transit, cycling and walking);
- the need to ensure that there are appropriate linkages between these systems;
- the need to develop a pathway system throughout the Township (Section 4A.4). The pathways are intended to recognize the importance of walking and cycling as forms of transportation and recreation.

Policy Amendment Recommendations

The following recommendations have been adopted by other municipalities to guide staff in the development of policies supportive of walking and cycling and could be incorporated into Official Plan policies.

Relating to Facilities and Programs

- Maintain a collaborative process in the on-going development of the cycling and pathway network including monitoring of usage, user consultation and consultation with area agencies.
- Develop a process to prioritize the construction timing and cost of new cycling and pathway facilities.
- Direct staff to actively pursue alternative funding sources for cycling and pathway facilities through provincial and federal programs.
- Promote the use of facilities and special events on the City’s website.
- Support walking and cycling through promotional campaigns and educational programs administered by the City.

- Coordinate initiatives with municipalities outside the City.
- Establish Pedestrian and Cycling Advisory Committees as Committees of Council.
- Protect and preserve abandoned linear corridors (e.g. railways, hydro transmission, unopened road rights-of-way) for potential pathway facilities.
- Upgrade existing cycling and pathway facilities and develop new facilities to promote tourism and economic development in Kingston.
- Provide incentives to businesses that increase walking and cycling as efficient and comfortable methods of commuting.

Relating to Land Use and Planning Approvals

- Require that walking and cycling issues be considered within planning area studies and site impact studies.
- Adopt site design policies that aim to minimize walking, cycling, transit and motor vehicle conflicts. Planning policies regarding infrastructure and urban design can reduce auto dependency.
- Encourage a road pattern and mix of land uses that are pedestrian and cycling friendly in new and redeveloping areas.
- Collaborate with developers and other agencies to promote walking and cycling in townscape, streetscape and landscape elements in site design.
- Discourage excessive motor vehicle parking provisions in downtown and urban areas.
- Adopt minimum bicycle parking standards for new developments.

4.6.2 Pathway Use Policy

Unlike within public roadway rights-of-way, where pedestrian and cycling travel is governed by the *Highway Traffic Act*, off-road pathways are typically unregulated. Public use of these facilities has not been formalized.

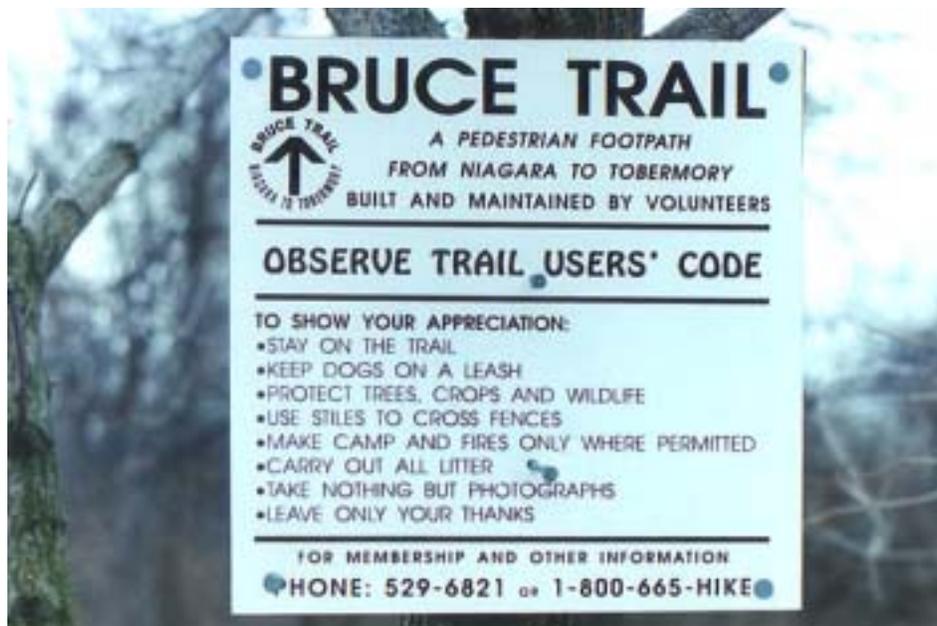
Responding to the growing number of complaints from the public concerning accidents or near accidents on pathways the National Capital Commission of Ottawa / Gatineau (N.C.C.) initiated a study to determine the best ways of reducing conflicts on multi-use pathways. No statistics were reported, but it was noted that threatening situations would continue to detract from the enjoyment of the pathways as use increased.

The most common hazard situation was the cyclist approaching pedestrians from the rear at high speed. Travelling cyclists and in-line skaters are fast and quiet, and when passing in close proximity to pedestrians, are often startling to pedestrians.

The following are some of the N.C.C. study recommendations, most of which the consultants support, intended to minimize user conflicts:

- **Separate Pathways for Pedestrians and Cyclists.** Unless separate paths are very close together, there is usually some condition different between the two, such as a view or accessibility that makes one path more attractive than the other. Designating separate pathways in Ottawa / Gatineau was attempted but compliance was unsuccessful. Therefore, it is generally not recommended to separate pathways unless there are special conditions to warrant such.
- **Encourage Non-Recreational Cyclists to Use Roadways.** Improve conditions for cycling on public roads for cyclists who wish to travel at high speeds.
- **Design of Recreational Pathways.** By designing new pathways to favour the pedestrian and specifically the slower speed recreational bicyclist, conflicts can be reduced. Open sight lines, highly visible signage, unpaved travel surfaces, gently curving routes and minimal grade changing are ideas to be incorporated into a “minimal conflicts”, shared-use pathway. Specific suggestions are as follows:
 - Refer to and promote the facility as a "multi-use recreational pathway" rather than a bikeway or trail.
 - Ensure that pathway maintenance is carried out.
 - Widen pathways from the 3.0 metres minimum standard to 4.0 metres or more where there is a high potential for user conflicts.

- **Rules of the Pathway Sign.** Prominently display a "Rules of the Pathway" sign at all major points of access to the facility. Rules should be clear and uncomplicated. They should emphasize right-of-use for both pedestrians and cyclists. Some suggestions are as follows:
 - **KEEP TO THE RIGHT EXCEPT WHEN PASSING**
 - **YIELD RIGHT-OF-WAY TO PEDESTRIANS**
 - **MAXIMUM SPEED SLOW - 20 KM/H**
 - **GIVE WARNING WHEN PASSING**
 - **KEEP DOGS ON LEASH AND OFF PATH**
- Most cyclist-cyclist and cyclist-pedestrian collisions occur on pathways and are the result of failing to yield right-of-way, unsignalized deceleration, erratic behaviour or following too closely.
- Include proper pathway use in all educational and promotional material.
- Separate amenities and features such as route maps, rest areas and drinking fountains from the general thoroughfare by at least 5 metres to avoid obstructing movement.
- The Bruce Trail Association has developed a Trail User's Code. It is posted on signs in guidebooks and on signs at trailheads and at major road crossings. A similar code should be developed for Kingston and posted at trailheads of appropriate designated pedestrian priority pathways.



Posted Bruce Trail Users' Code

4.6.3 Draft Crossing Policy

In 2002, the City of Kingston developed a draft Pedestrian Crossing Policy. The draft policy provides a formalized basis for improvements at roadway crossing locations having specific safety concerns. The draft policy places priority on users with special needs, such as children and seniors. The draft policy is to be administered by the Kingston Engineering Division's Traffic Office. The draft policy recommends two crossing facility alternatives:

- Pedestrian Crosswalks designated with warning signage and;
- Traffic Control Signals that employ push button activated traffic signals. These crossings may be supplemented with warning signage, refuge islands, sidewalk bulb-outs and other features as necessary.

The Pedestrian Crossing Policy recommends warrant thresholds based on:

- Past practices within Kingston and other municipal jurisdictions
- Published guidelines such as the *Manual of Uniform Traffic Control Devices*
- The *Highway Traffic Act* of Ontario

4.6.4 Accessibility Policy

The City of Kingston has recently established an Accessibility Advisory Committee currently comprised of six citizens who volunteer their time. This committee was mandated by the Province and is in accordance with the *Ontarians with Disabilities Act, 2001* and endorsed by Kingston's City Council. The following is the mandate of the Committee:

- to advise Council annually about the preparation, implementation and effectiveness of its Accessibility Plan;
- to review site plans and drawings as described in Section 41 of the *Planning Act* and provide advice to the Manager of the Planning Division;
- to provide advice to Council on the accessibility for persons with disabilities to a building, structure or premises or part of a building, structure or premises that Council purchases, constructs, significantly renovates; or for which Council enters into a new lease; or that a person provides as municipal capital facilities in accordance to Section 210.1 of the *Municipal Act*;
- to provide advice to Council regarding the City's purchase of goods and services through the City's procurement process to meet the City's obligation to have regard to the accessibility for persons with disabilities to the goods and services;

- to consult with and advise staff and Council about accessibility issues; and
- to perform all other duties specified in the Regulations.

As a new city committee, it is uncertain how the Accessibility Advisory Committee will coordinate with the functions of the Planning, Engineering and Cultural Services. This *Kingston Cycling and Pathways Study* deals with accessibility issues primarily with regards to sidewalks and pathways. It is hoped that the Accessibility Advisory Committee and the City will review the accessibility guidelines recommended in this Study and incorporate them in the future pathway development.

The Accessibility Advisory Committee should determine how to effectively allow the use of motorized scooters by persons with disabilities, yet otherwise restrict the use of motorized conveyances (i.e. trail bikes and snowmobiles) by persons without disabilities.

4.6.5 Sustainability and Public Health Policy

The City of Kingston should acknowledge the environmental and social benefits of walking and cycling by promotion and education. By being more active and reducing the use of the automobile the citizens of Kingston and the natural environment will both benefit. The following is a list of reasons why Kingston should promote walking and cycling as an important municipal priority:

- Human-powered transportation, whether it is walking, cycling, running, in-line skating or cross-country skiing, is a sustainable action. The motive power transmitted by human muscle is created from the food we eat. The human body and the bicycle are incredibly efficient. On a standard Canadian diet the average healthy person can walk to work or ride a bicycle to the store and not require additional fuel to do so. People are powered by inexpensive, renewable bio-energy.
- Human-powered transportation is quiet and pollution free. Transportation powered by the burning of fossil fuels creates air pollution in the form of hydrocarbon gases. Pollution Probe reports the following with respect to hydrocarbon gases:

“These gases react primarily with nitrogen oxides in the presence of sunlight to produce photochemical smog, the familiar urban haze that causes respiratory disorders and erodes buildings. Smog’s principal component is ozone, a greenhouse gas and a suspected cause of forest damage. Gas-powered motor vehicles produce almost half (42percent) of all hydrocarbon pollution in Canada”.

Obviously, any effort to reduce the peak concentrations of ground level ozone will benefit the health of the public.

Of other air pollutants, transportation sources produce 66 percent of environmental carbon monoxide (CO) and the majority of airborne particulates. CO is a gas poisonous to

humans and wildlife, and airborne particulates such as soot reduce visibility, blacken buildings, damage plants and are suspected in the onset of cancer and other diseases.

Transportation sources are also responsible for 64 percent of total nitrogen oxides, which is a cause of acid rain, and 30 percent of carbon dioxide, a contributor to global warming. Reducing harmful emissions and non-renewable energy is the objective of the Kyoto Accord.

- The relationship between physical fitness and both general health and stress management is growing in its credibility and importance. As a generalization, people are becoming more sedentary, psychologically stressed and unable to burn off the calories consumed as food. Walking, cycling and other forms of exercise are of benefit in a number of ways. For example:
 - One or two extra walking trips a week can burn off enough calories to reduce nearly a kilogram of body weight in a year. This is approximately the weight that Canadians gain annually according to a study published in the *Annals of Behavioural Medicine*.
 - Physical exercise increases the aerobic capacity of the individual. Increased circulation strengthens the heart and improves the oxygenation of the blood. Walking and cycling obviously exercise and tone the legs, however, other muscle groups are benefited as well.
 - Traveling by one's own power is personally challenging and satisfying. The act demonstrates a concern for the environment and a general expression of independence and self-sufficiency.
 - Commuters who choose cycling rather than automobiles or public transit benefit from lower vehicle and operating (i.e. gasoline, fare and insurance) costs. Commuter timing for travel is flexible and unscheduled and service is door to door. Traffic congestion and the lack of finding a convenient parking space are no longer stressful concerns.
 - Recreational travel is enjoyable, thought provoking and fun.
- Human-powered transportation can be enjoyed by a wide variety of users, including children, the elderly, persons with disabilities and the financially disadvantaged.

5.0 Conceptual Planning of the Kingston Downtown Waterfront

Considering the results of Kingston's Waterfront Public Consultation process in 2002, and the comments received as part of the *Kingston Cycling and Pathways Study*, there is growing public interest in improving public access and enjoyment of waterfront lands. The downtown waterfront is defined for this Study as the area between Macdonald Park and Riverview Park. It is a complex urban environment with a rich mix of residential, commercial and recreational uses. It includes the historic and cultural heart of the community, as well as the majority of the focus for tourist accommodation.

The scale and character of Kingston's centralized downtown is very conducive to travel and exploration by pedestrians and cyclists. The shoreline of Kingston Harbour is both a natural barrier and a focus of interest and activity. The downtown waterfront is the place where three important pedestrian and cycling patterns coincide:

- Pedestrian travel flows broadly between the Confederation Park / Hotels waterfront enclave and Kingston's commercial main streets (primarily Brock & Princess Streets). City Hall, the outdoor market, restaurants and shops are destinations easily accessible through this area by foot. The purpose of these trips is characteristically utilitarian (i.e. shopping) and recreational (i.e. tourism).
- Over varying distances, cyclists and pedestrians travel along King Street East, Ontario Street and the La Salle Causeway on what may evolve as an extension of the Lake Ontario Waterfront Trail. En route destinations include museums, marinas and parkettes. The purpose of these trips is characteristically recreational (i.e. tourism and fitness).
- There are two groups of cyclists and pedestrians, representing Queen's University in the west and CFB Kingston and the Royal Military College in the east, who travel back and forth to the Kingston Central Business District and through the downtown waterfront. The purpose of these trips is characteristically utilitarian (i.e. shopping and going to work) and recreational (i.e. fitness).

The intent of this focused downtown waterfront study exercise is to explore human-based travel, in advance of other studies that have already begun (the *North Block Central Business District Study*, the *Kingston Transportation Master Plan* and the *Downtown Action Plan*). The goal is to present ideas that will generate public interest in the waterfront based on experiencing it as a pedestrian or cyclist, and as a resident or a tourist.

This mini study includes a detailed plan (Map 6), a set of conceptual development guidelines and a series of pictorial representations depicting the potential character of spaces en route. It is our opinion that the general public often has difficulty understanding the technical terminology and conceptualization associated with master plans. We hope to engage the public's imagination with the following presentation materials that includes graphics, local context, human reference and explanatory text.



Western Beaches Boardwalk, Toronto

Before and After Scenes

The following eight scenes show areas of the Kingston waterfront as they are in 2003, and how they could be developed in the future. It is important to emphasize that these scenes are very conceptual. The pavement, plantings, site furniture and signage depicted are representational only. Conceptual alignments have been shown on property that may be privately owned. The City would need to negotiate access to these lands. The City may not be successful in reaching some agreements, in which case facilities would not be built on those lands. Consider alignments shown on private lands to be hypothetical at this point.

NOTE:

Electronic version of "before and after" scenes can be found online at:

<http://www.cityofkingston.ca/residents/transportation/pathways/beforeandafter.asp>

Pathway Development Design Guidelines for the Kingston Downtown Waterfront

1. Urban Design Approach

It is recommended that it is inappropriate to employ a suburban parks approach to the redevelopment of an urban waterfront. Continuous waterfront public space is limited through the downtown area. Shorelines, property lines and buildings are major existing constraints. Vast lawn parkland with a wide multi-use pathway meandering through it is not a facility ideal that can be implemented downtown. A condensed, pedestrian-focused urban approach is called for.

2. Pedestrian Oriented

Although it has generated some controversy, the Study consultants recommend that riding cyclists and striding in-line skaters should not be facilitated along the downtown shoreline on a typical multi-use pathway. They should be facilitated on public roadways slightly further inland where they can travel faster and avoid conflicts with pedestrians. Cyclists have the potential to travel at speeds in excess of 40 km/h and inline skaters have limited stopping capability. Within the tight confines and right-angled corners of the urban waterfront, cyclists and in-line skaters are incompatible with promenading pedestrians and wandering tourists. Attempting to enforce careful travel and slow speed limits is considered unrealistic. The most straightforward approach is to initiate and as effectively as possible enforce segregation. For consistency this would be year round and for all hours. This should not be considered a hardship for cyclists or in-line skaters. They can still enjoy access to the downtown waterfront; they just have to do so as pedestrians. A desire to travel quickly or to avoid automobile traffic is not acceptable reasons to include cyclists and in-line skaters on the waterfront pathway through downtown Kingston. There are opportunities to facilitate these objectives elsewhere. Two sections of multi-use pathway are just beyond the downtown in Macdonald Park and Fluhrer Park.

3. Establish an Approach Theme

There are certain approaches that tend to strengthen the image and cohesiveness of a waterfront pathway system. The goal is to create an interesting environment and an identifiable sense of place. To accomplish this the City is encouraged to establish a theme that expresses the unique character of Kingston and its waterfront. This theme could emphasize a historic, environmental, fanciful or neutral perspective. Regardless of whatever theme the City chooses, it should be expressed consistently. Signage, site furniture (i.e. benches, light standards, railings, garbage receptacles, etc.) and promotional material should all be consistent with the chosen theme.



Shade Structure, Cobourg



Colourful Banners, Trenton

4. User Friendly

There are a number of ways to make the Kingston downtown waterfront more user friendly. The need to eliminate the danger and distraction of cyclists and in-line skaters has been discussed above. Other considerations include personal security, way finding and microclimate.

To create a comfortable environment for all potential users it is particularly important to ensure that concerns for personal security have been anticipated and addressed. The key issues are open sight lines, escape routes, elimination of hiding spaces and appropriate lighting. For more details see Guideline (.3) – Personal Security.

If way finding has been successfully addressed, pathway users will move confidently and knowledgeably through the waterfront. Signage and promotional material should explain to them what attractions and destinations are available, and where they are located. Services including washrooms, telephones, parking lots and first aid are important to pathway users.



Way Finding Sign, Toronto

Minimizing the effects of adverse weather and unpleasant conditions extends the use of waterfront facilities and creates a more comfortable environment for pathway users. Providing shade and rain / snow cover, as well as buffering prevailing wind and sources of noise will minimize their negative effect.

5. Authenticity and Context

Kingston has a rich and real history. Its waterfront should aim to celebrate this legitimate resource. Unlike Disneyland that borrows identities from other places and reproduces them superficially, Kingston should draw from local sources. Heritage resources, indigenous materials and current events should find their way into the interpretation of the waterfront.



Boat Race Watching, Mississauga

6. Ebb and Flow

Pedestrian travel is similar to the action of running water. There are places where people will naturally stop and congregate, typically at seating areas, crossings, good viewing locations and attractions. There are stretches of pathway where pedestrians will typically walk right through. Pathway designers need to anticipate where the ebb and flow will occur and adjust pathway widths and “crush spaces” appropriately. This situation is most evident when large crowds are using a pathway system, such as during a special event (i.e. walkathon) or a holiday (i.e. Canada Day fireworks). In consideration of crowds, pathway designers need to anticipate potential trip hazards, where vegetation will wear or be trampled, and if the railings and pedestrian bridges are strong enough to support the weight and force of a large group of people. How pathways cross roadways and negotiate corners will require special attention. A balance needs to be created between making roadway crossings obvious, yet unobtrusive. At crossings, pedestrians must be aware of opposing traffic and the need to stop and look before crossing. However, the crossing itself should be as seamless and continuous as possible. Pathway pavement should extend across roadways. Signage, textural pavement, access control bollards and curb cuts should herald the importance of the crossing, but not interfere with a streamlined transition.



Seating Niche, Cobourg

7. Range of Attractions

Further to the urban design approach that is recommended for the Kingston downtown waterfront, providing as wide a range of attractions as possible is the ideal. Although strolling along a shoreline pathway is enjoyable enough, it is desirable to encourage numerous pedestrian-oriented attractions and destinations along the waterfront. Consider the following quote from the City of Toronto Waterfront Revitalization Meeting that was held on December 9, 2002.

“Having too many parks and open spaces near the water’s edge is not a good idea. It will be underused in the summer, and not used in the winter. Parks and bike trails don’t attract many people. We need a good mix of bars, cafes, boats, museums, etc. Halifax is a good example...Parks to us also means public spaces...It is a critical component. These areas need to have diverse attractions.”



Harbourfront Outdoor Café, Toronto



Children’s Play Area, Hamilton

6.0 Conclusion

At the conclusion of a cycling and pathways study such as this, it is useful to summarize the most significant revelations and recommendations that have presented themselves over the course of the project. The following is a list of the major conclusions and observations that the Study consultants have to offer the City of Kingston:

- Kingston has a unique potential. It could become a city that embraces and benefits from the many positive effects of a pedestrian and cycling focus. The size, character and make up of the City with the University and high number of tourists are well suited to pursue this practical and enlightened transportation alternative. However, there is much to be done. In comments about the *Kingston Transportation Master Plan's* ambitions for pedestrian and cyclists, a Kingston Councillor has stated, “Kingston’s future depends on citizen’s making some fundamental shifts in thinking...This is not going to be easy...This is not going to be painless.”
- Kingston has been slow off the mark with respect to pedestrian and cycling initiatives. Results are occurring elsewhere but not in Kingston. The Lake Ontario Waterfront Trail concept has transformed the profile and viability of municipal waterfronts in nearby places such as Cobourg and Pickering. The urban planners of major progressive Canadian cities are heeding the needs of pedestrians and cyclists. Yet Kingston has not adopted a proactive approach. We question what is the source of the City’s hesitancy? We hope that the *Kingston Cycling and Pathways Study* will help the City to focus on this issue and move forward.
- Kingston needs to muster the political will and direction to address pedestrian and cycling issues seriously. This is more than supporting a “motherhood issue”. It is a potentially expensive and challenging process that has the potential to physically reshape the community. Development budgets need to be secured, staff time needs to be allocated and agreements with MTO, private landowners and affected businesses need to be negotiated. Kingston needs to decide if pedestrian and cycling advances are important or not, then act accordingly.
- Without the benefit of proper direction, City staff and user / interest groups have done the best they can. Much of the current energy is being put into piecemeal projects. Again, we hope this *Kingston Cycling and Pathways Study* will provide the needed direction. There are a number of specific situations that deserve mentioning:
 - The abandoned K & P railway should be acquired and developed.
 - MTO should be pushed to facilitate the recommended crossings of Highway 401.
 - The City should rally the federal government to improve public accessibility and use of key waterfront lands, and in particular the La Salle Causeway.

- “Courtesy Crossings”, remote paved maintenance widenings, and inconsistent public access to “walkway” rights-of-way need to be reassessed. Creating facilities where they are easy to implement, rather than where they are needed, also needs to be reassessed. Boulevard pathways and isolated cycling lanes are examples of misdirected energy and effort.

- It is commonly observed that some pedestrians and cyclists disregard traffic laws and common courtesy. Many cyclists are afraid of travelling in traffic or on multi-lane roadways. Without effective enforcement or education programs in place it is difficult to put all the blame on these individuals. The City should seriously address these issues and implement programs to rectify these problems.

- Everyone involved needs to work together. Through consultation with local interest / user groups, the CRCA, the KFL & A Health Unit and Loyalist Township, it is evident that the City of Kingston is not alone in the pursuit of improvements in cycling and pathways. Excellent knowledge and enthusiasm exists within the community. Success and change will often depend on the knowledge and enlightenment of City staff. Individuals who understand the needs and preferences of others will be invaluable in the endeavour to work cooperatively.

- Just do it. It is easy to look for excuses not to walk or cycle. Most of the actual deterrents are psychological. A lack of facilities or support programs does not mean these transportation alternatives cannot make a difference immediately. Initiating creative ways to inspire the community to get active is the first step. Strong participation will drive the necessary political will.

7.0 Maps

8.0 Appendix One

Appendix One - Glossary of Terms

Annual Average Daily Traffic (AADT) – A term that describes the relative traffic volume of a roadway. The term refers to the number of vehicles travelling in both directions and for all travel lanes over a 24-hour period, unless noted otherwise.

Bollard – A sturdy post that restricts the access of motor vehicles to areas such as pathways and pedestrian precincts.

Boulevard pathways – Are typically two-way multi-use pathways located in the roadway right-of-way, typically within the grass boulevard. Often the purpose of a boulevard pathway is to duplicate or replace the on-road cycling use of the roadway. Boulevard pathways are not recommended except as a part of a recreational-focused facility where short lengths of this type of off-road pathway can bridge gaps between otherwise discontinuous sections of pathway or cycling route.

Contra-flow cycling lanes – A cycling lane facilitating travel in the opposite direction to the flow of traffic on an otherwise one-way roadway.

Courtesy Crossing – Is a type of pedestrian roadway crossing that depends on the courtesy of the vehicle driver to grant the right-of-way to a crossing pedestrian. The crossing pedestrian does not have the right to cross.

Defacto cycling lanes – Paved shoulders, maintenance widenings and pavement space outside of roadway edge lines that are often unofficially used as travel areas by cyclists. Either these areas have not been designed or intended for the purpose of cycling, or for other reasons have not been appropriately designated by the local authority. Under these circumstances cyclists without official sanction are using them.

Dooring – The term that describes a cyclist being hit by the opening door of a parked automobile.

(Kingston) Facility Network – The combined service of existing and proposed linear facilities (pathways, roadways and sidewalks) designated by the City for focused travel by pedestrians and cyclists.

Flashings – An inexpensive type of route designation signage for pedestrian-priority pathways located in natural areas. Typically a flexible sign substrate is nailed into pathside trees or posts.

Grade separation – Typically bridges or tunnels that separate the crossing of travel ways by aligning them at different elevations.

Intersection Pedestrian Signal (IPS) – A signalized roadway crossing for pedestrians consisting of a painted lines crosswalk and standard traffic signals. A pedestrian crossing phase is initiated only when a pedestrian pushes a post-mounted button from the sidewalk. Otherwise the signal stays green.

Limestone or stone fines – A paving material for pathways that consists of a compacted top layer of stone gravel that has a small particle size. This paving surface is less expensive than asphalt but requires periodic regrading. It does not provide the same traction as asphalt.

Offset gates – An obstruction feature on an off-road pathway that has two potential purposes. One is to restrict the access of unwanted users (i.e. motor vehicles and motorcycles) onto pathways. The other is to slow pathway users down in advance of crossings or other pathway hazards. A fence or other continuous barrier blocks the pathway right-of-way. The opening is made up of two barriers that extend partially across the pathway from both sides. They are offset at a distance that allows pedestrians and cyclists to filter through the opening at a slow speed.

O.P.S.D. – Ontario Provincial Standard Drawings. This is a series of construction details for features such as curbs, sidewalks, fencing and drainage structures that are used by the builders of roadways and other civil engineering projects.

Paved boulevard strips or “kill strips” – A narrow strip of pavement on the boulevard immediately adjacent to the back of curb. Typically installed as a set back for sod to protect it from salt spray, sand and snow deposition. Not intended as a cycling or pedestrian facility.

Paving maintenance widenings – A portion or all of a roadway shoulder that is paved to maintain the integrity of the adjacent vehicular travel surface pavement. Also referred to as paved shoulders.

Pedestrian precinct – Sidewalks and other paved or appropriately surfaced areas intended for the exclusive use of pedestrians. Cyclists must dismount and walk their bicycles. In-line skaters must have a brake applied while proceeding slowly.

Roadway crown, super elevation – The centre of a roadway or off-road pathway is typically higher than the edges. It is “crowned” to facilitate surface drainage to the sides of the travel surface. To better facilitate traction around a curve a roadway or off-road pathway is banked away from the outside edge or super elevated.

Roadway edge line – A solid white line that demarcates the outside limit of the intended vehicular travel surface.

Shoulder check – Bicycles typically do not have rear view mirrors. A shoulder check is how a riding cyclist determines what is happening behind them. In advance of signaling, making lane changes and turning, a cyclist twists around to look quickly over their shoulder.

Shy distance – The buffer space between a roadway travel lane and a cycling lane, sidewalk or traffic barrier. This clearance distance is useful for emergency manoeuvrability, to minimize the aerodynamic effect of passing vehicles on cyclists, splashing and temporary snow storage.

Stop bar – The white painted pavement line at a roadway intersection behind which vehicles are intended to stop.

Traffic calming – A variety of measures used to slow down vehicles or to restrict their access on certain roadways. These measures include stop signs, low speed limits, posted hours of restricted access, traffic filters, speed control humps, right-in / right-out diverts, etc.

Traffic filter – Due to their narrow width and manoeuvrability, pedestrians and cyclists can fit through right-of-ways as narrow as the width of a multi-use pathway or, if necessary, an even narrower pedestrian precinct such as a “walkway”. An example of a traffic filter is a multi-use pathway connecting the ends of two roadway cul-de-sacs. Another example is traffic-calming facilities (i.e. speed control humps, turn restrictions) that slow or restrict motor vehicles but allows cyclists to pass through them. By creating traffic filters pedestrians and cyclists can be filtered through travel barriers that cannot be crossed by motor vehicles. Travel barriers that restrict crossing by motorists, such as residential neighbourhoods, parks, natural areas and utility corridors, can be accessed and crossed by pedestrians and cyclists if effective traffic filters can be established.

Urban area – For the purpose of this Study the Kingston urban area has been differentiated from the rural and regional context by the constraints of the mapping exercise. The focus of facilities is on the urbanized area of Kingston bordered roughly by Bur Brook Road, the Lake Ontario waterfront, the Lemoine Point Conservation Area and the Butternut Creek Swamp Forest. The Study urban area is larger than the “urban area” defined in the Official Plan.

Vehicular cycling approach – An attitude and method of cycling where the cyclist operates on the roadway as an equal to other vehicle operators. The cyclist adheres to all the same rules of the road as other vehicle operators. They signal, change lanes and turn as other vehicle operators do. Cyclists are not second-class roadway users. Other vehicle operators should not grant them unnecessary advantages.

Vehicle(s) – Includes motorized vehicles (cars, trucks, buses, motorcycles, mopeds, etc.) and human-powered vehicles (bicycles, tricycles, bicycle trailers, trail-a-bikes, tandem bicycles etc.).

“Walkways” – Term used by the City of Kingston for public rights-of-way generally connecting streets that may or may not have a sidewalk or pathway built on it. Generally intended for pedestrian travel.

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