BICYCLE ROUTING
FOR THE CITY OF YELLOWKNIFE

Increasing Commuter and Recreation Bicycling With a Focus on Safety

Project #: 20080850
October 31, 2008

Prepared for:

Community Services Department
City of Yellowknife
P.O. Box 580
Yellowknife, NT X1A 2N4

Prepared by:

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LISTEN. DESIGN. MANAGE.

FSC File: 2008-0850

November 4, 2008

City of Yellowknife
Community Services Department
P.O. Box 580
Yellowknife, NT X1A 2N4

Attn: Grant White

Re: Bicycle Routing Project – City of Yellowknife

Dear Grant:

FSC Architects & Engineers are pleased to provide you with fourteen copies of our final report on Bicycle Routing in the City of Yellowknife. It has been a pleasure working on this project with you.

This report provides the City with an important beginning to increase bike ridership with an emphasis on safety. Increased bike commuter ridership places this transportation mode within the aspect of active transportation and can be linked in a number of ways to Smart Growth and implementation techniques including capital budgeting process. We have provided you with a report that provides sufficient background and recommendations to move forward.

We look forward to other opportunities to work with you and the City of Yellowknife.

Sincerely,

FSC ARCHITECTS & ENGINEERS

Patricia Richards, MCIP

Community Planner/Project Manager

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Introduction

Bicycling is rapidly becoming an important mode of transportation in Canada. Research shows that making cycling safer, more convenient and enjoyable increases ridership and ensures that bicyclists are respected on the roads and on trails for both commuter and recreational use.

Yellowknife, despite its cold, harsh winters presents a strong interest in bicycling. Reasons for this could be that Yellowknife is relatively compact and flat. The long days of spring and summer increase interest in the out-of-doors and recreational activity. Vehicular traffic volumes are low and the speed is somewhat slower than in other Canadian cities. For all of these reasons, there appears to be a higher bicycle ridership than most would expect in Yellowknife.

The City of Yellowknife through the Community Services Department has initiated a bicycle routing project in order to build on work that has been done on bike routing and trail studies and to encourage bicycles as a viable mode of transportation in Yellowknife in a safe and enjoyable manner. Work done by Ecology North's Transportation Issues Committee including; Way To Go – Yellowknife Bike Routes Expert Advise; The Integrated Parks, Trails and Open Space Development Study (09-08) and information from other sources provided a backdrop for this project.

FSC Architects & Engineers were engaged to provide the City's Community Services Department with proposed routings for bicycles, signage suggestions and to provide bike routing recommendations all to be included in a report with emphasis on bike safety in the City of Yellowknife.

This report will provide background information on bike riding in the City of Yellowknife and make recommendations for a proposed bicycle routing strategy, bicycle lane design, signage issues and future work.

Information on bike routing from other cities across Canada and the U.S.A was analyzed. Site visits were undertaken to understand roadway widths, parking, safety and signage. Consultation was carried out with key stakeholders and a public Open House held on September 18, 2008.

Example: Striped bike lane including on street parking – Halifax, Nova Scotia

1 Consultant Team

1.1 FSC ARCHITECTS & ENGINEERS

The team:

Patricia Richards, MCIP – Urban/Community Planner/Project Manager

Kevin Hodgins, P. Eng. – Civil Engineer, Principal

François Grenon, Leslie Merrithew and Christine MacKinnon – Technical Assistance

Client:

City of Yellowknife

Grant White, Director of Community Services Department

Consultation:

- Consultation with other City departments
  - Planning & Development, Public Works and By-law Enforcement – August 19, 2008
- Consultation with the Public – Open House – September 18, 2008

2 BACKGROUND

2.1 INFORMATION

The City of Yellowknife through the Community Services Department is interested in increasing bike ridership and providing a safe and enjoyable riding experience in a variety of ways in the City.

A method of increasing ridership and safety is to provide for bicycle routes and bike lanes. Bicycle Lanes are in the public right-of-way and usually used by bicyclists only. A portion of the roadway can be striped and signed as a bike lane. Bicycle Routes are signed where bikes are encouraged but not necessarily a striped bike lane. Ending bike lanes abruptly is the most negative aspect of bike lane striping. Some argue that these lanes can give bicyclists a false sense of safety. Bike lanes users are always required to obey the rules of the road as well as caution regarding parked vehicles, door openings and merging into traffic.

Other methods of providing for safe and increased bike ridership include signage (directional and awareness); reducing the safety problems in certain areas (hot spots) and making multiuse trails more bicycle-friendly including ways to share the trail. Public awareness and educational activities also assist with bike safety. Special events including bike days, web site information and increased information in a variety of media are opportunities for cycling awareness and assist with safer bike travel. Other options include developing Plan policy relating to Smart Growth principles, implementation techniques in the Zoning Bylaw, bike lane design standards and standardized signage. Installing good quality bike racks and implementing techniques to mitigate theft also increases bicycle riding. Many larger cities have a bicycle co-ordinator on staff whose job includes promotion and awareness of bicycle travel and co-ordination of bike routes/lanes and standards.

A discussion on the existing conditions relating to bike riding in the City of Yellowknife, consultation and information on design of bike lanes is provided. This information led to recommendations in Section 3 in order to make bike riding in the City of Yellowknife safer.

2.2 EXISTING CONDITIONS

Many cyclists in Yellowknife and other cities use their bikes for commuting while enjoying strong recreational value and outdoor enjoyment. These commutes include home to work, to school, to visit friends and family, and for shopping. Cyclists also use bikes for a variety of recreational uses – exercise, fun, socializing and opportunities to experience the environment (both natural and built). In Yellowknife, bicyclists use the multi use trails, streets and sidewalks for commuting and recreational cycling.

3.2.1. Multi Use Trails

Currently several of the multiuse trails in Yellowknife, especially the Frame Lake Trail, are heavily used by cyclists both recreationally and to commute primarily from home to work. The Frame Lake Trail requires upgrading, as there are areas that are narrow and have surface irregularities. Lack of signage, the width, spring foliage and growth, and people ignoring rules of multiuse trails relating to safety issues on the trails are some of the safety issues of the Frame Lake Trail. These issues create conflicts on the trails for cyclists, walkers and runners. The Frame Lake Trail is an important part of a bike routing strategy in Yellowknife and should have immediate attention. Other multiuse trails in the City will require attention including linkages to proposed bike lanes and routes and improvements to assist with bike riding safety.

2.2.1 Sidewalk Use

In Yellowknife there is a higher rate of bike riding on the sidewalk than in many other urban areas. This may be for safety reasons and the fact that many of the sidewalks in Yellowknife are wide - some as wide as 2.4 M. or 8 ft. Cyclists may feel safer on the sidewalks while reducing the fear of car door openings from parked cars or conflicts with the vehicular traffic especially at lighted areas and intersections where traffic volumes may be higher. Laws are clear that the bicycle belongs on the street or on a designated trail system. Sidewalks are not designed for bike riding.

2.2.2 Hot Spots, Integration and Site Review

Work carried out by Ecology North, Transportation Issues Committee in 2007 provided information on hot spots or areas of major safety concern for bicyclists. Ecology North reports titled Yellowknife Bike Routes Project Phase 2 – Final Report and *Way To Go – Yellowknife Bike Routes Expert Advise* provided the City with information and a backdrop for this part of the work.

Using this existing information, site visits confirmed these 'hot spots". Other unsafe areas were reviewed from information received at the Open House. These hot spots were considered areas that require immediate attention and will be addressed in the recommendation section and are shown on Map A-1 by an identifiable letter A – H.

- **A** – Area in the vicinity of the Yellowknife Co-op – lack of safety for both bicycling and walking area including difficulty connecting with existing trail, high traffic volumes and the concert barricade.
- **B** - The area behind Stanton Hospital – Boardwalk and ramp and underpass area are dangerous for walkers and bicyclists.
- **C** - The Multiplex area – traffic at the intersection of Airport Rd. and access & egress to and from the Multiplex creates safety problems for bicyclists
- **D** - Highway # 4 – Access Road to City – no linkage to trails and difficulty to access trails in both directions
- **E** – 43rd St – No left hand turns permitted
- **F** - Old Airport Rd. at Borden Ave. – Safety issues on Road, bike lane striping on one side – very faint, difficulty with number of driveways, street irregularities and higher traffic volumes from commercial and industrial land uses
- **G** – Highway # 4 – Narrow shoulder and lack of linkages to safer bicycle areas
- **H** – MacDonald Dr. – Old Town – One Way section – lack of safety driving space on the street.

Ecology North's reports also included information on bike racks, signage and public awareness. This work should be revisited by the City and determined how the recommendations can be incorporated into City policy and/or capital works projects. A number of bike racks have recently been purchased by the City and will be placed strategically at City owned facilities.

Information was received from the City of Yellowknife – Integrated Parks, Trails and Open Space Development Study, September 2005. Pertinent recommendations from this study that apply to bike safety and trail usage include:

- Regular Reporting of results and implementation of the Integrated Parks, Trails and Open Space Development Study to the public
- Develop a policy that deals with trail maintenance, coordination and inspection
- That the City commits long-term resources to implement an acceptable level of parks, trails and open space service.
- Continue the positive relationship between user groups to address issues of safety on trails through provision of signage and education.

These recommendations assisted in formulating the recommendations for this report.

Site visits and discussions with City staff indicates that there are streets that could accommodate bike lanes by lane striping in the existing street right of way but would require upgrading and improvements along with appropriate signage. Information received for this report was conclusive that connecting to existing trails is an important part of a bike lane/route program. Map A-1 shows a proposed routing including linkages to existing multiuse trials. Making these connections or linkages is an important part of bicycle riding safety in Yellowknife. These trails give bicycles alternatives to moving into vehicular traffic.

2.3 OTHER INFORMATION

2.3.1 Active Transportation

Active Transportation refers to any form of human-powered transportation such as walking, cycling, in-line skating, skateboarding, paddling, ice-skating or skiing. It is any trip made for purposes of getting yourself, or others, to a particular destination – to work, to school, to stores (shopping) or to visit friends. It can also involve combining modes such as walking/cycling with public transit.

Active Transportation policies and design opportunities form part of cities' official plans, energy plans, transportation planning and a variety of ways in Cities and urban areas across Canada.

2.3.2 Designing Bike Lanes

While bike lanes are desired in urban locations, designers face the reality that most urban streets are surrounded by built-up environments, and are already constrained by automobile traffic. Finding the extra width for bike lanes is often very difficult in retrofit situations, unless plans call for a roadway-widening project. For downtown Yellowknife, roadway widening for bike lanes may not be a desired option, since it could cause problems for pedestrians by further reducing sidewalk space or reducing turning lanes on the street.

Retrofitting urban streets to include bike lanes has become an important feature of the modern city.

To accommodate bicyclists on busy roadways in urban areas, bike lanes generally serve bicyclists and motorists best. Streets in urban areas are too often built without bike lanes or space for bicycle lanes. These streets act as deterrents to bicycle travel and may cause conflicts between bicyclists and motorists.

Retrofitting bike lanes to many existing urban streets/roadways using the following methods can accommodate the needs of cyclists and improve bike-riding safety.

- Marking and signing existing shoulders as bike lanes.
- Physically widening the roadway to add bike lanes.
- Restriping the existing roadway to include bike lanes.

The standard width for a bike lane is 1.8 meter (6 feet) for a one-way travel way.
Minimum widths are:

- 1.5 (5 feet) against a curb or adjacent to a parking lane
- 1.2 meters (4 feet) on un-curbed shoulders. A 1.2-meter (4 –feet) curbed bike lane may be allowable where there are very severe physical constraints.

Many cities use 1.2 meters (4 feet) as an acceptable minimum width for all bike lanes in urban areas.

The first step in the design of bike lanes is to determine which streets make the best connections for bicyclists. Connectivity, linkages and parking were also considered when determining the routing for the bike paths in Yellowknife. Removing on street parking can create a strong outcry from politicians and the public especially in the Downtown areas.

On street parking was reviewed on 49th Ave., 43rd St, 44th St. and Franklin Ave. when developing the recommendations for the bike lanes. New angled on street parking will be provided in front of City Hall and therefore a bike lane on this part of 49th Ave is not considered practical. Vehicles backing out can create serious safety issues for bicycles. A complete parking survey of all Yellowknife streets was not part of this study.

2.4 SIGNAGE

Bike signage has to be clear, consistent and visible in order to provide for bike lane location, directions and appropriate pavement markings on the bike lane as well as providing for bike awareness.

Signs can be used in a variety of ways to make people aware of the bike lanes and routes as well as prompted to share the space. Signage is provided in the recommendation section of this report. Bike signs that had been previously used should be removed and a new bike signage program initiated.

2.5 CONSULTATION - WHAT WE HEARD FROM OTHERS

2.5.1 Key Informants

A meeting with Key Informants - City Employees

FSC Architects & Engineers - staff – Planner and Engineer - met with representatives from:

- Community Services – Director
- Planning & Development Services – Director
- Public Works – Manager
- By-law Enforcement officer

Goals, a proposed route and signage were discussed.

The following points were brought out:

- Consider School Draw to 52nd Street as a bike route and connecting in various locations to the Downtown and to the multiplex.
- Consider connecting bike route to Kan Lake Rd
- Winter bike driving – may not be considered in the best interest of cyclist and the City
- Smart Growth issues to be considered – increasing residential density in Downtown, which allows for more people and encouraging the use of bicycle as a mode of transportation (active transportation).
- Borden Ave. discussed – safety concerns at intersection with Old Airport Rd
- Old Airport Rd. discussed – bike lane and future land uses were considered
- Range Lake Rd. discussed for bike routing
- Phased opportunities for routing as a possibility for City's capital budgeting process
- Parking issues identified – loss of parking on 49th Ave – could be an issue
- Share the Path (share the road) signage for existing trails is important
- Stanton Hospital hot spot not on City owned land therefore cannot be included in a city project.
- Consider curb design when designing bike lanes and routes
- Frame Lake loop to highway is an important feature of the part of the multiuse trail system

2.5.2 Open House – Public

An Open House was held on September 18, 2008 to receive feedback on suggested bike lanes and routing from bicycle riders and people interested in bike riding in the City of Yellowknife. Approximately 25 people attended from a variety of backgrounds. All were interested in the work and were able to give suggestions and valuable feedback. A route map was displayed showing proposed bike lanes and routes, hot spots and signage. Sign-in, feedback sheets and verbal comments were provided.

This feedback was analyzed and categorized as follows:

Bike Lanes

A number of suggestions regarding location and how to accommodated bicycles safely were made. Many felt that this project this was a good start and a positive approach to increasing bike safety ridership in the City.

- Bicyclists take most direct route just like vehicles. Don't send us (bike riders) to secondary routes just because they are less busy.
- In the past, there was no thought put into where people live and where they go – suburb to downtown - corridors are currently excluded.
- Include bike lane up the hill from Old Town to Downtown
- Bikers will ride down Franklin, either on sidewalk, on road or on bike paths if provided. It is important to help bikers to do this safely.
- A bike lane on Franklin Ave would be an asset
- Many participants indicated that they liked the proposed bike lanes
- There was strong emphases for creating a safe feeling on the roadway as a bicyclists
- A concern expressed about bike striping – in winter – and in general as it may create a false sense of safety.

Bike Route – Proposed

- Desire to get Kam Lake Rd. area to Downtown and to Stanton Hospital by bike safely
- Multiplex area and intersection – safety issues and routing – trying to find an appropriate route to get through the intersection and to access the multiplex. Reminded that bicyclists are not unlike vehicular traffic – they want a direct route.

Other Safety Considerations Discussed:

- Maintaining on-street parking – concerns expressed about car door openings
- Options for bike routing in a variety of locations
- Type of bike lanes – routes and design options including one and two way
- Signage – share the road/street – stressed as very important
- MacDonald Dr. after government wharf is a hot spot/dangerous area for bicyclists

3 Recommendations

All of the information was reviewed and taken into consideration in order to make the following recommendations.

Goals are often a part of any set of recommendations. They were developed at the beginning of this project in order to give strength, a starting point, justification and a useful approach to moving the recommendations forward.

3.1 Goals

- Create safe riding opportunities for all bicyclists both commuter and recreation
- Provide for an emphasis on safety when developing policy, plans and implementation strategies – Safety for everyone especially the bike rider
- Increase opportunities to bike ride in the City
- Provide linkages to existing trails for bicyclists
- Focus on bike riding as a part of Active Transportation policies
- Link this report with Yellowknife's Smart Growth Plan

3.2 Bike Lanes And Routes

3.2.1 Bike Lanes – Location, Mapping and Standards

Recommendation # 1: The City recognizes the value of bicycle travel as part of an Active Transportation strategy by considering bike lanes/routes for new street construction and retrofitting existing streets. A complete survey of Yellowknife streets should be carried out in order to determine which streets could be retrofitted.

The following standards are to be used for design bike lanes either within the existing right-of-way or when designing new streets

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TABLE 1 – BIKE LANE STANDARDS/CRITERIA

BIKE LANE WIDTH One Way	STRIPING	SIGNAGE	ISSUES
1.2 M. (4 ft.) minimum **Note**: Bike Lanes should always be one way	150 mm (6-inch) solid white line separating bike lane from motor vehicle lane 100 mm (4-inch) solid white line separating the bike lane from parking spaces	Diamond and or bike design paving markings along the route as indicated in this example.  Requires appropriate signage where lanes begins and ends – see Section 4.2.5 on Signage	Connectivity – Bike lanes should always connect to multiuse trails and bike routes as shown on Map A-1. Awareness of sharing the vehicular travel way is an important aspect of this connectivity. Abrupt termination of bike lanes can make bicyclists move in awkward ways in traffic. Signage and awareness assist the bicycle moving into sharing space with vehicular traffic

3.2.2 Bike Lane Locations

Recommendation # 2: The City of Yellowknife consider within a 5 year time frame the development of a bicycle lane project to include both sides of the street beginning at MacDonald Dr. in Old Town proceeding up Franklin (50th) Ave to 45th Street, along 49th Ave to 48th St. as shown on Map A-1. Temporary pavement markings and signage could be used while the lane is being monitored and if successful permanent markings and signage installed.

Inserted Maps B4, B5, B8, and B9 show the recommended routing for this bike lane. These maps are excerpts from the complete routing Map A-1 as Appendix B of this report. The lane is shown as a solid red line.

Appendix A provides a street cross section for 44th Street proposed Bike lane and an example of a road striping bike lane.

Recommendation #3: The City of Yellowknife, after monitoring the 49th Ave Bike Lane and if positive, provide for the second phase of a bicycle lane project to include both sides of Old Airport Road from Borden Ave. to Hwy #3 shown on Map A-1 and on insert maps B5 and B8. Old Airport Road should be monitored regularly especially at the intersection of Borden Ave for bicycle safety and to determine if curb and gutter will improve the situation. Access, egress points and driveways are required to be analyzed for safety along the street.

3.2.3 Bike Routes

Recommendation #4: The City of Yellowknife provide for bike routing program as shown on Map A-1 and B4, B5, B6, B7, B8, B9, B11, B12. These routes require signage – directional and awareness signs (share the road) as well as bike routes mapped and provided for in brochures and web sites.

3.2.4 Multi Use Trail

Recommendation #5: The City of Yellowknife survey Frame Lake Trail in order to provide for safer bike travel. Considerations for improvements include: widen the trail at various locations, stripe a centre lane and improve and update signage. All existing signage relating to bicycles should be removed immediately. Consistent signage design for all of the trails is an important aspect of awareness and safety.

4.2.5 Signage Program

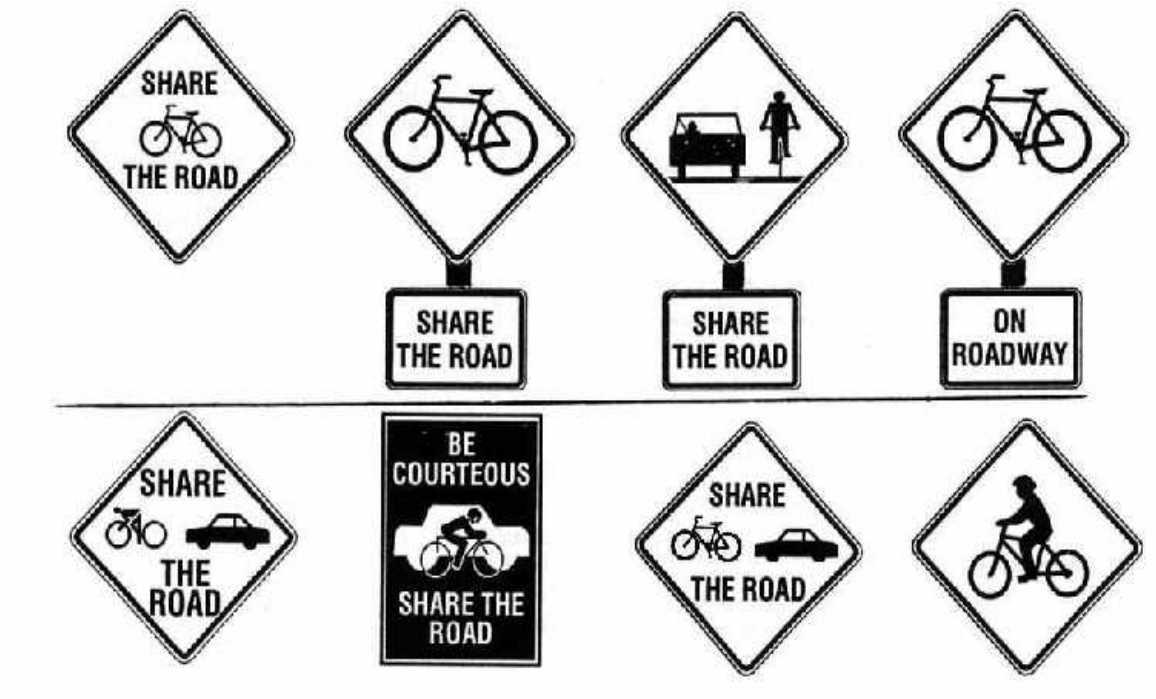
Recommendation # 6: The City of Yellowknife incorporate a signage program for bike lanes, routes, multi use trails and awareness. Table II provides recommended signage. All existing bike signs must be removed. Entrances to the multi use trails by bicycle should be clearly marked as a bike lane and signs along the trail to Share the Trail.

SIGNAGE TYPE	LOCATION	DESIGN
BIKE LANES		
DIRECTION INDICATOR - MOCK UP 	▪ At the beginning of the proposed Bike Lane on Franklin Ave at 43rd (or 44th St). ▪ At the linkage to the Frame Lake Trail at 48th St. ▪ At the beginning of the Bike Lane on 49th Ave. ▪ At the beginning of the Bike Lane on Old Airport Rd. These signs can also used as directional signage to the Bike Routes as shown on Map A-1.	Colour: To be determined by the City. Recommended Colour: Black. Sign to be designed using City of Yellowknife logo and appropriate colours. Shape of sign to be determined by City standards. Alternates:  

BIKE LANES	LOCATION	DESIGN
BIKE LANE ENDS 	Where the Bike Lane Ends At strategic locations along the bike lane	60 cm x 76 cm (24”x30”) Black on White – Reflective Attach to post 45 cm from curb
ALONG THE LANE 		
BIKE ROUTES	**LOCATION**	**DESIGN**
BEGINNING OF BIKE LANE 	At the beginning of the bike routes	Black on White – Reflective Attach to post 45 cm from curb
ALONG THE BIKE ROUTE 	Strategically placed along the route.	White on Black – Reflective Attach to post 45 cm from curb

SHARE THE ROAD	LOCATIONS	DESIGN
SHARE THE ROAD/STREET  W11-1 / W16-1 Share the Road with Bicyclists assembly 	This is a Territorial Road Sign - the Dept. of Transportation – GNWT. Two of these signs are currently within the City limits – one on the access road to the # 3 and the other on the #4 hwy. These signs should be strategically placed along the roadway would assist with awareness and improve BIKE safety. City to co-ordinate locations with Dept. of Transportation	Design is prescribed by Dept. of Transportation from the Transportation Manual.

OPTIONS FOR SHARE THE ROAD SIGNS



Notes:

- These signs can be adapted for multiuse trails and street – **SHARE THE TRAIL; SHARE THE STREET**
- Install at all channelized intersections at point where bike lane stripe ends.
- Attach to post 45 cm (18”) from curb
- Signage to be consistent so that everyone becomes aware of the same message. Only one of these signs should be adopted as the official sign of the City.

3.3 Safety/Public Awareness

3.4 Policy and Hot Spots

Recommendation # 7: The City of Yellowknife initiate an Active Transportation Plan to be included as part of the Smart Growth Planning process and this report act as a catalyst for an active transportation strategy with implementation techniques.

Recommendation # 8: The City of Yellowknife review the hot spots as identified on Map A-1 and consider the following solutions

Hot Spot A - Yellowknife Coop area – improvements, signage and linkages to multi use trail along with surveying the area for options for improved access into the Coop.

Hot Spot B – Area behind Stanton Hospital – most of the concerns will be alleviated with the extension of the multi use trail. The boardwalk is on Stanton Hospital property. Discussions with the Hospital administration should address the safety issue on the boardwalk and the linkages to public rights-of-way and multi use trails.

Hot Spot C – Multiplex Area – Bike routing from the Old Airport Road and connections to the Frame Lake Trail will assist in improving the safety at the intersection. The intersection at the Multiplex, bike safety to and from the Kam Lake area and Franklin Ave requires attention both with signage and pavement treatment. A bike lane should be considered adjacent the sidewalk on the northwest side of Franklin Ave – shown on Map A-1.

Hot Spot D – Highway #4 – Access Road – requires discussions with GNWT – Dept of Transportation to widen the shoulder and strip the lane to a minimum of 1.2 meters (4 ft.) including signage and Share the Road signs.

Hot Spot E – 43rd Street – Install “except bikes” under no left hand turn sign.

Hot Spot F – Old Airport Rd. – Safety should be improved with the striping of a bike lane and improved signage. Monitoring the intersection at Borden Ave is important.

Hot Spot G – Highway #4 **–** Discussions with the Department of Transportation to widen the shoulder and improve the linkages to the multi use trails.

Hot Spot H – MacDonald Dr. – street improvements required.

3.5 AWARENESS

Recommendation # 9: The City of Yellowknife in association with bicyclists, outdoor organizations and schools expand on an annual bike day, which could include a bike ride for the proposed routes and bike lanes, distribution of fliers, safety awareness, and providing assistance to people who may not own a bicycle.

Recommendation # 10: The City of Yellowknife review the work done by Ecology North, Transportation Issues Committee, and Way to Go Report to determine others areas that need to be implemented.

4.6 Other Considerations – Future Work

The City develop priorities for special studies in the following areas:

- Mapping bike routes for brochures and web site
- Cause and location of bicycle accidents
- Monitoring the effectiveness of bike lanes and designs
- Needs analysis for new bike routes including origin and designation
- Barrier and street imperfections removal analysis
- Review existing streets to determine retrofitting options
- Consider Franklin Ave from 44th to 53rd for possible bike lane retrofitting
- Review shoulder and pavement markings with the Department of Transportation, GNWT in order to assist with advice and identifying safety issues.
- Zoning Amendment – Amend Zoning By-law No. 4004 to include Bicycle Parking provisions for all new commercial – retail and office, industrial, institutional developments – a minimum of 3 bike racks depending on the size of the development. Bike racks specifications to be included in zoning provisions.

Example - Bike lane with roadway signage

Appendix A: Bike Lanes Sketches

ATTACHMENT - MAP A-1 – PROVIDED AS AN ATTACHMENT – UNDERSEPERATE COVER