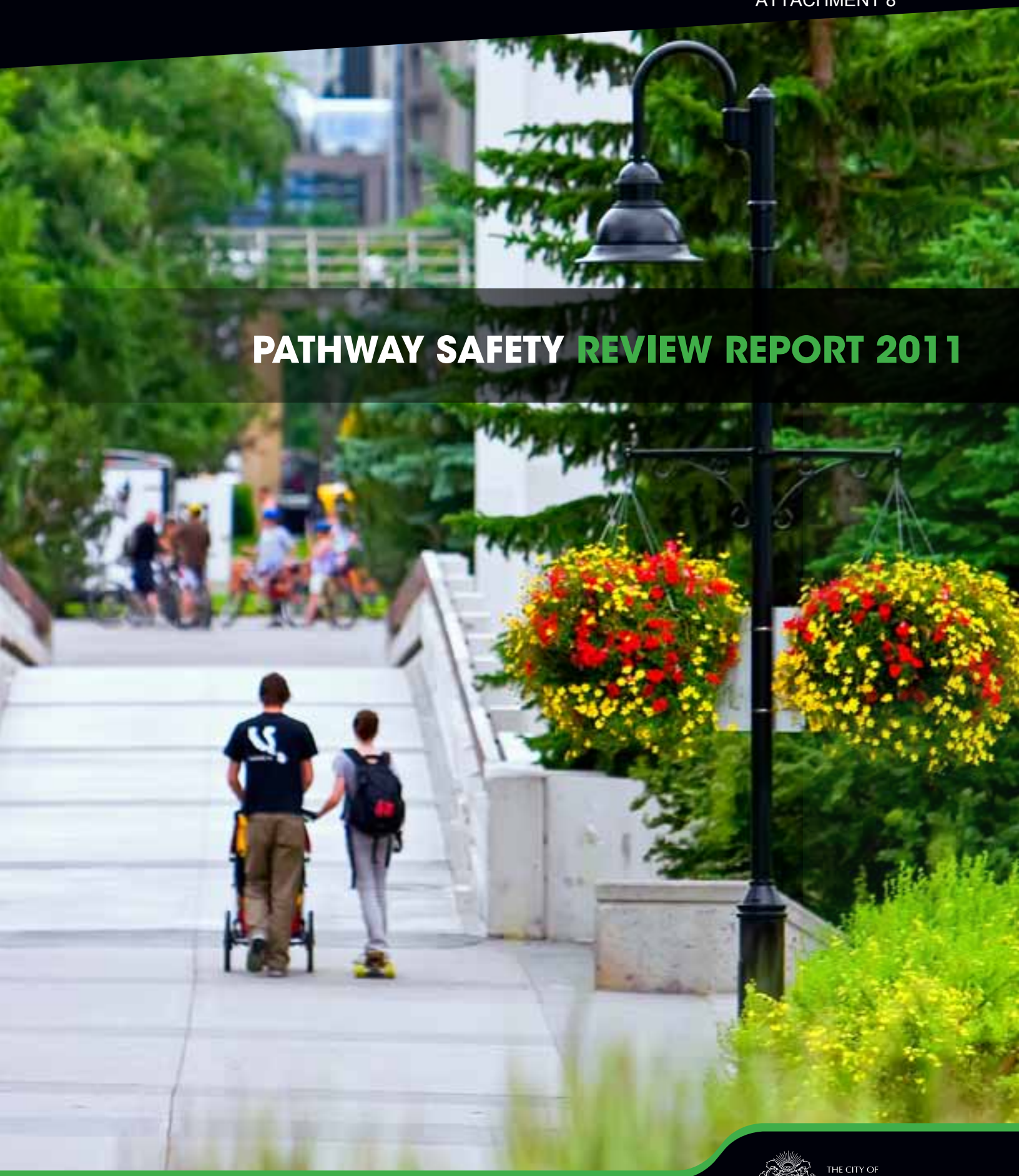

PATHWAY SAFETY REVIEW REPORT 2011

This Safety review is examining the entire pathway system. Components of the review include:

I. Backgrounds section:
Provides information on the vision for the pathway system, existing plans and policies guiding the pathway system, and a brief description of the system itself. This section identifies the scope, intent and customers (users) of the pathway system, and the realm in which safety must be considered.

II. Investigation and Findings section:
Provides details on current pathway issues; public use; public complaints; public engagement efforts; current and projected pathway surface conditions; planning and design assessment of the current pathway system; education (enforcement activities); accident claims by users; and systems in other cities.

III. Conclusions and Recommendations section:
Provides conclusions/recommendations, implementation strategies, timelines and financial costs to address and enhance public safety.

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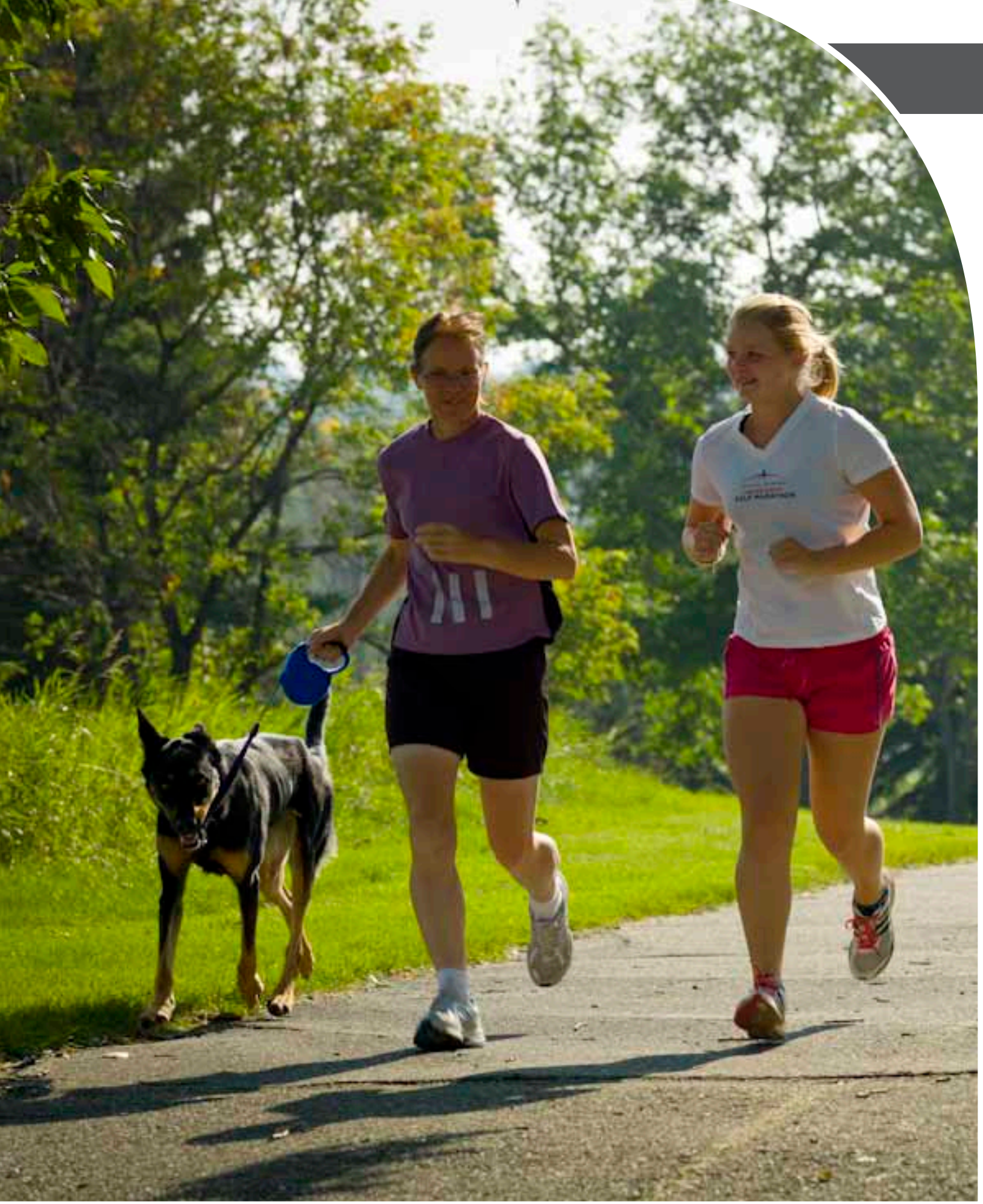


EXECUTIVE SUMMARY

1.0 Approach

The City of Calgary Parks undertook a safety review of the existing pathway system at the direction of Calgary City Council. The report and recommendations herein are a result of:

- A review of existing plans and policies.
- External engagement with the Calgary Pathways and Bikeways Advisory Council (CPAC).
- Internal engagement with City of Calgary business unit subject matter experts.
- Pathway user surveys.
- Public surveys (telephone, online, and intercept).
- 311 analysis.
- Annual pathway surface assessments.
- Assessment of existing pathway system infrastructure components.
- Pathway falls and collision reports.
- Perspective from other cities.

2.0 Key findings

1. **Issues -** An analysis of all the information collected from the Calgary Pathways and Bikeways Advisory Council as well as a variety of City of Calgary business units resulted in five main issue areas:
   - Actions and behaviours of users.
   - Planning and design.
   - Condition of assets.
   - Maintenance.
   - Emergency response.

2. **Public use**
   - Volume of use is increasing.
   - Diversity of use is increasing.
   - Percentage of walkers, runners and users with dogs is increasing.
   - Percentage of cyclists and in-line skaters is decreasing.
   - Percentage of male users is decreasing and percentage of female users is increasing.
   - Percentage of different age groups is remaining fairly stable with adults predominant.

3. **Public engagement –** A private consulting firm was hired to perform surveys on the users of Calgary's pathway system. The surveys consisted of a telephone survey, an online survey and an intercept survey. Some highlights of the surveys include:
   - The four most common reasons for using the pathway system are similar across each of the three samples: exercise, recreation, walking a dog, and commuting. The telephone and intercept surveys recorded exercise as the most common use; online sample gave commuting as primary use, followed by exercise.
   - Walking is the most broadly participated activity on the pathways followed by cycling and running for the telephone and intercept participants. This was the case as determined by the pathway usage counts (50.7% walking; 28.2% cycling; 16.5% running). For online participants, however, cycling is the most common activity.
   - Use of pathways in off-leash dog areas is fairly consistent across the three samples ranging from 28–32 per cent.
   - Highest usage occurs during June, July and August followed by the shoulder months of April, May, September and October.
   - There is a relatively high familiarity with pathway bylaws among pathway users. More than half of each sample group stated they are either "somewhat" or "very" familiar.

- With respect to dogs on pathways, there is consensus from all samples that keeping dogs on a leash and under control are important.
- Regardless of the sample, the majority of pathway users agree bylaw regulations need to be enforced.
- The perception of safety is very high for those citizens who participate in walking, cycling or jogging on the pathways with at least 90 per cent of all users saying they feel "very" or "somewhat" safe. The exception is for inline skating which is lower at 82 per cent.
- There is concensus among all samples that the most unsafe factor is the behaviours and actions of other users.
- Respondents from all the different samples indicated that the most important actions to improve safety are more education of bylaws, more enforcement of bylaws, widening the pathways, and more twinned pathways.

4. Condition of pathway surface

Annual inspections are performed on the pathway surface with each segment rated as Green (good physical condition), Yellow (deterioration evident) and Red (failure imminent).

- A comparison of the annual inspections show that over the past five years, the number of kilometres of Red pathways has gone from 24.4 to 35.6 kms while Yellow pathways have increased from 60.9 to 163.8 kms. Most of this increase is due to the large number of pathways built in the early and mid 1990's that are now reaching the end of their lifespan.

5. Assessment of pathway system infrastructure components

In 2010, staff conducted an assessment of Calgary's pathway system using The City of Calgary Parks' "Development Guidelines and Standard Specifications – Landscape Construction 2010." The numerous guidelines and specifications all relate to safety items. These current standards were applied to a pathway system that originated 36 years ago. Deficiencies relating to current standards and guidelines were found. They were recorded and quantified, and solutions are identified.

6. Education/enforcement activities

- All the clauses in the Parks and Pathways Bylaw 20M2003 pertaining to pathways relate to safety. Information and rules taken from the Bylaw are used to develop education and enforcement strategies.
- Education on pathway rules, or components thereof, is currently done by a variety of business units including Parks, Animal and Bylaw Services, and Transportation.
- Education efforts include written materials, website information, displays and in-person programs on the pathway system, at public forums, or at private businesses.
- Enforcement is targeted and occurs sporadically on the pathway system, but with each passing public survey, the public identifies it as a need and a significant way to increase public safety. In all 2010 survey samples, the percentage of the public that believes in the need for enforcing the pathway regulations varied from 61-69 per cent.

7. Pathway falls and collisions

- Between 2005 and 2010, an average of 2–4 falls or collisions per annum on the pathway system were handled by the Law Department's Claims division. Twothirds of the falls and collisions reported to Claims relate to the condition of the pathway (asphalt) surface, or the slipperiness (e.g. ice, mud, gravel) of the surface.

8. Perspective from other cities

- Six out of 10 cities responded to our survey including Edmonton, Ottawa, Minneapolis, Denver, Seattle and Portland.
- The pathway systems in all the cities varied greatly in size from 74 kms in Seattle to over 700 kms in Calgary. The populations reported by each city also varied greatly. Calgary had the third largest population behind the Metro Denver area and Ottawa. In all the cities, the pathways went through developed parks, natural areas and road right-of-ways. Calgary has more pathways on hills than the other cities. In all the cities, there are a variety of structures associated with their pathway systems (e.g. bridges, overpasses, tunnels), though none to the same degree as Calgary.
- All cities allow all non-motorized modes (walkers, joggers, cyclists, dog walkers, etc). In addition electric assist bikes are allowed in Edmonton, Denver, Portland, Seattle and Minneapolis. Portland and Minneapolis also allow Segways. Calgary and Ottawa do not allow any motorized modes on their pathways with the exception of wheelchairs and strollers for persons with disabilities. In all cities, major users are recreationalists and people getting exercise, but all systems have commuters.

- All cities allow dogs on their pathways, but they must be on a leash. In addition, all the cities surveyed have off-leash dog areas, but not to the same degree as Calgary. None of the American cities have pathways through off-leash areas; all of the Canadian cities do, but again not to the degree that it occurs in Calgary.
- All of the cities have rules or bylaws that apply to their pathway systems. Three of the cities have no speed limits, but they have laws stating users must travel at reasonable speeds at all times.
- Calgary is the only city that manages its pathway system as a unit. Other jurisdictions have a variety of stewards, and because of this shared jurisdiction or because pathways were considered a component of some other asset (e.g. park or sidewalk), maintenance budgets were not known for their systems.
- All the cities except Seattle do snow removal. Though at 157 kms, Calgary clears more snow than any other city except Ottawa, Calgary clears the smallest percentage (22%) of the total pathway system. Again, the costs for other jurisdictions are unknown because of shared jurisdiction or combined functions.
- All the cities have similar major issues, broadly categorized as user actions and behaviours, condition of asset, and planning and design. None of the cities have a way of effectively tracking accidents on pathways.

3.0 Recommendations

1. Pathway surface infrastructure

- Establish ongoing capital funds to address pathway life cycle needs taking into consideration the backlog of current declining pathway surfaces and future needs identified through annual surface inspections.
- Resource additional operating funds to increase minor pothole and miscellaneous repairs thereby extending the life of some pathways before life cycling is required.

2. Additional pathway system infrastructure improvements

- Establish capital funds to address safety issues on the existing pathway system infrastructure, excluding pathway surfaces. Safety issues relating to the following pathway components will be addressed: adjacent landscaping, curves, hills, blind corners, signage, intersections, bollards, bridge/pathway transitions, lighting, fixed objects within 1 metre.

3. Planning and design

a) New infrastructure

- Increase minimum width on local pathways from 2.0 to 2.5 m.
- Enhance consistency on planning, design approval and inspections in regards to the 1 m safety clearance and setback requirements. In the few cases where this can't be achieved, review the hazard and determine possible mitigation measures.
- Develop design options for twinning pathways (separate "wheels" from "heels").

b) Existing pathways

- Increase width of regional pathways in river and creek valleys to 4 m wherever possible.
- Increase widths of local pathways to 2.5 m wherever possible.
- Increase widths of regional pathways in the uplands to 3 m wherever possible.
- In some areas, consider twinning as an alternative to increasing widths.

c) New Planning initiatives

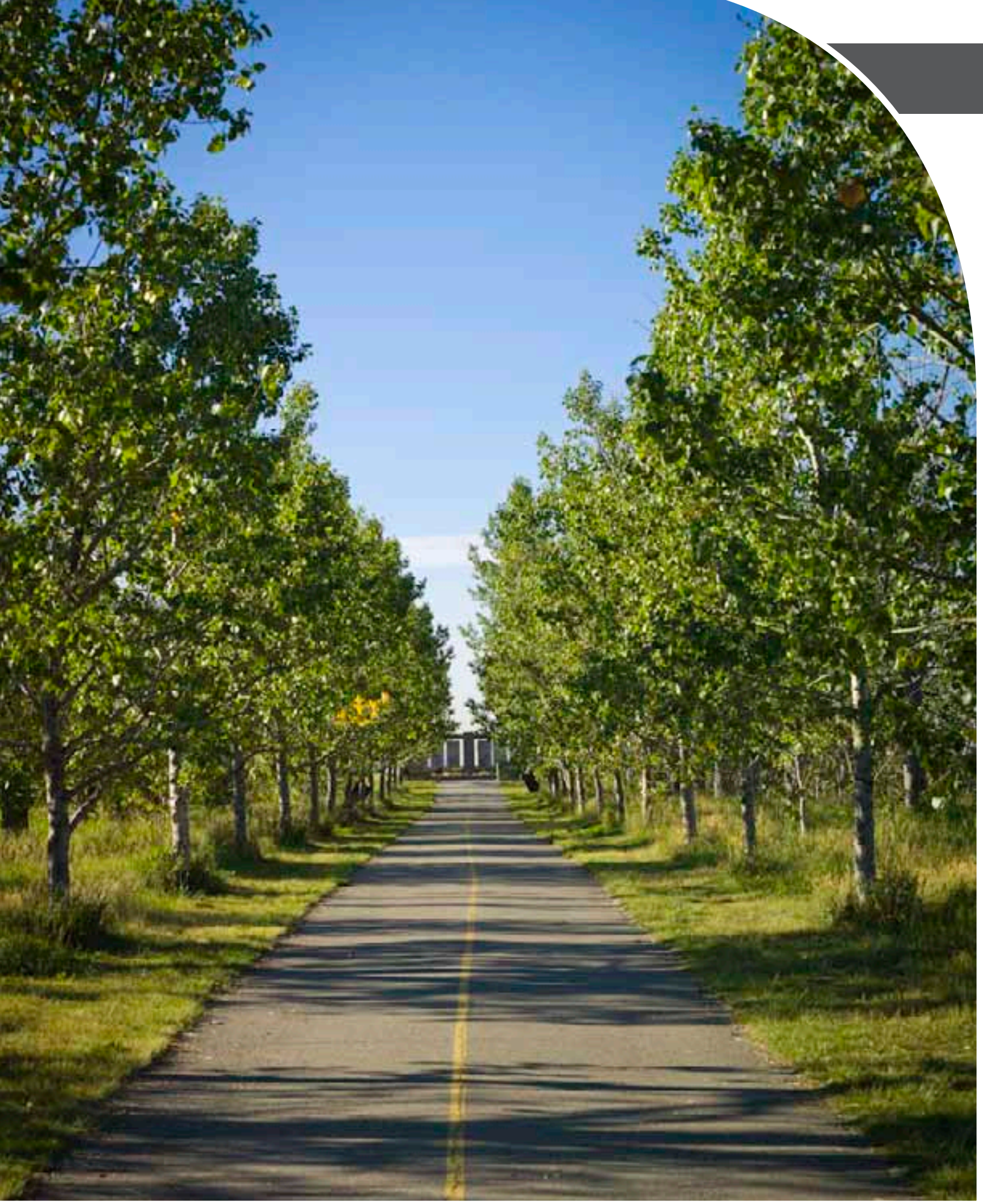
- Create a lighting policy for pathways.
- Investigate feasibility of allowing electric bikes and Segways on pathways.

4. Maintenance

- Increase annual snow and ice removal on pathways from 157 km (22%) to 300 km (42%).

5. Education/enforcement activities

- Develop and implement a comprehensive joint Education Plan for multi-use pathways with Transportation, Parks and Animal and Bylaw Services (ABS).
- Increase bylaw officer presence and targeted enforcement on the pathways with a joint Parks and Animal and Bylaw Services work plan.



Section I - BACKGROUND

1. Introduction

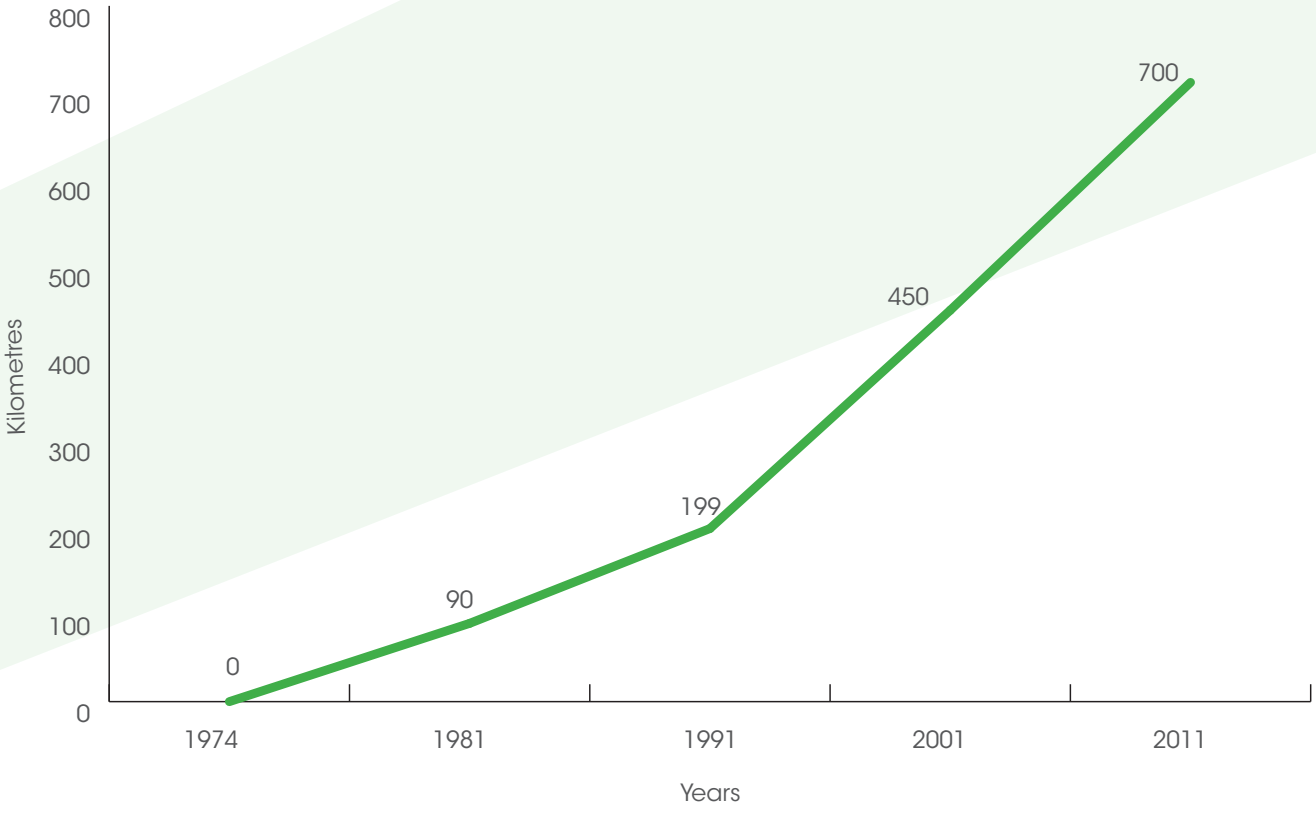
The Calgary pathway system started in 1974 with the vision of creating recreational riverbank pathways along the Bow and Elbow rivers. The Bow River pathway was to connect Bowness to Fish Creek Provincial Park, while the goal of the Elbow River pathway system was to connect Fort Calgary to Weaselhead Natural Environment Park.

The original vision was expanded by the development of two provincial pathway systems connecting to Calgary's pathway system. The Fish Creek pathways run east-west the length of the provincial park from the Bow River to 37th Street SW.

The other provincial pathway, known as the W.I.D. pathway, connects to Calgary's system near the weir in Inglewood, and follows the Western Irrigation District (W.I.D)canal all the way to Chestermere Lake.

The pathway system has always been very popular with, and strongly supported by Calgarians. It now stretches more than 700 kilometres in length. Since the mid 1990's, the vast majority of pathways have been built by the housing development industry. Figure 1 illustrates the tremendous growth in Calgary's pathway system.

Figure 1 – Growth of pathway system



The importance of the pathway system as a recreation, exercise and transportation facility is recognized in many City plans and policies. From specific development plans and specifications (Development Guidelines and Standard Specifications: Landscape Construction), to the vision of imagineCalgary, Plan It Calgary, the Calgary Open Space Plan and the Calgary Transportation Plan, Calgary's pathway system has a place of prominence.

2. Pathways – past, present and future

The pathway system has become an important facility within Calgary's urban fabric. The City's first official pathway was a short stretch along the river in the downtown area in the mid 1960s. In 1974, Calgary Parks and Recreation expounded on a much larger vision; specifically a linear riverbank recreational system throughout Calgary. This idea was ever-expanding by moving the concept beyond the river valleys to the creek valleys and uplands throughout Calgary's communities. With Calgary's booming growth, the development industry became actively involved in building pathways within their community plans.

Pathway planning is an integrated (design) exercise that takes place at multiple stages of community development. In new and developing communities, this begins at the policy level (Area Structure Plan) followed by more detailed community design (Outline Plan) which is then carried through to construction as part of park landscape design and development and roadway design. In established and redeveloping communities, pathway planning is addressed at the policy level (Area Redevelopment Plans) as well as through other city-wide policy and implementation initiatives (i.e. Pathway and Bikeway Plan) and park development plans that serve to address key missing links.

In 2000, Parks and Transportation Planning realized how integrated pathways were in the visions for both business units, from both the users' perspective and from the interface of pathways with on-street bikeways and roads. Both business units worked together to develop the Calgary Pathways and Bikeways Plan. What follows is the vision, objective and concepts for the pathway and on-street bikeway network.

VISION

The City of Calgary is committed to being a healthy place to live, work and play. It recognizes the importance of walking, running, cycling, wheelchair use, skateboarding, in-line skating and all other non-motorized modes of movement as positive contributors to the urban fabric. These non-polluting modes have inherent value as viable and efficient means of both recreation and transportation. They facilitate healthy, active living, and contribute to overall community vitality.

Calgary embraces the vision of a city of neighbourhoods which are interconnected by a network of friendly streets and pathways. The network is available to all Calgarians, regardless of age, gender, ability, income or culture. The Pathways and Bikeway Network offers a convenient alternative to the automobile, and provides year-round access to enjoy linear recreational opportunities.

OBJECTIVE

The pathway and on-street bikeway systems, operating together as a network, are envisioned as an urban system that can serve both transportation and recreation objectives. This is premised on the following concepts:

- The primary use of pathways is multi-use recreation.
- The primary use of on-street bikeways is bicycle travel.
- Many trips on pathways and on-street bikeways are made for a combination of fitness, recreation and transportation purposes.
- Recreation and non-motorized movement have positive benefits for the health and wellness of participants.
- Recreation and non-motorized movement have positive benefits for the urban environment.

Non-motorized modes of travel such as walking, jogging, in-line skating and cycling have inherent recreational and fitness components. Pathway users should be able to access the pathways to travel for whatever purpose they have in mind, whether purely for recreation, transportation, or both. When pathways are used for both recreation and transportation, it is important to ensure that they are used appropriately, such that all users operate compatibly and with respect for each other.

Many recreational and sport cyclists use the roads as a way to explore the city and get some exercise. The on-street bikeways are not purely a transportation facility. Any bike ride has an element of enjoyment, recreation or fitness to it. Again, it is important to ensure that bikeways are used appropriately.

Appropriate pathway use is determined by a number of factors, including:

- Multi-use recreation.
- Volume of users.
- Pathway role in linking parks and natural areas.
- Limited speed.

Appropriate on-street bikeway use is determined by:

- *Highway Traffic Act* provisions governing road users.
- Bikeway role in linking the main urban facilities.

The Pathway and Bikeway Plan encourages linear recreation and transportation activities as a means to incorporate exercise into daily life. This is the "active living" philosophy.

Calgary is now planning well into the future, with such exercises as imagineCalgary, the Municipal Development Plan and the Calgary Transportation Plan. Pathways are an important infrastructure helping achieve numerous targets set by the imagineCalgary Plan. They are integral to reaching built environment and infrastructure system targets, natural environment system targets, and social system targets.

Pathways also address The City's social, environmental and economic goals – consistent with its commitment to sustainability. Pathways contribute to the four goals outlined in the triple bottom line sustainability assessment:

- Community well-being
- Economy
- Sustainable environment
- Smart growth and mobility

Pathways are integral infrastructure in Calgary. They must be well managed, with safety as a paramount concern, so that Calgarians continue to value the importance of the pathways, and express their satisfaction with the system well into the future.

3. Description of the pathway system

Calgary's pathway system is over 700 km in length. It is an intricate network, with pathways along our rivers and creeks as well as in all the upland communities of Calgary. The pathways connect to bridges, pedestrian overpasses, roadways and LRT stations in addition to connecting our open spaces and specific community features. The pathways are categorized as either regional (connecting communities) or local (within communities). There are approximately 493 km of regional and 213 km of local pathways.

Pathways are hard-surface. The vast majority are asphalt, but there are a few pathway segments that are made of concrete or interconnecting brick. The widths of the pathways vary depending on their category, location and construction date. The City's current design guidelines call for minimum widths of 2 m for local pathways, 2.5 m for regional pathways in the uplands, and 3.5 m for regional pathways in the river and creek valleys.

Besides the pathway surface, there are many features and amenities associated with the pathway system that need to be considered in a pathway safety review.

Here are some interesting features of Calgary's pathway system clipped from mid 2010 inventory statistics:

- 3,576 pathway intersections.
- 964 pathway signs.
- 908 benches along pathway system.
- 1,714 bollards on pathway system.
- 87 underpasses on the pathway system.
- 308 pathway and bridge intersections.
- 51 pathway and pedestrian overpass intersections.
- 89 park bridges on the pathway system.
- 426 playgrounds within 2 m of local pathways.
- 66 playgrounds within 5 m of regional pathways.
- Approximately 53 km of the pathway system run through existing off-leash dog areas, with another 8.4 km running adjacent to off-leash dog areas.
- Approximately 215 km of the pathway system are in roadways, with roughly 485 km in open space.

Section II - INVESTIGATIONS & FINDINGS

1. Current issues and challenges

The Calgary Pathways and Bikeways Advisory Council (CPAC), the Province's EMS, and numerous City business units were consulted during the process of identifying and prioritizing pathway safety issues. Staff from the following business units/sections were invited to participate: Animal and Bylaw Services, Roads, Transportation Planning, Transportation Infrastructure, Calgary Transit, Parks, Fire and Police.

Together, these major stakeholder groups identified and then prioritized a number of pathway issues or challenges. Five major categories were developed with detailed feedback provided. Items in the light green area of each category reflect the major concerns. It should be noted that the category of "Actions/behaviours of users" was felt by the stakeholders to be prevalent city-wide, whereas the other issues were more localized.

Table 1 – Pathway system issues

Actions/behaviours of users
• Off-leash dogs (in both off-leash and on-leash areas).
• Conflicts between user types (cyclists, walkers, runners, inline skaters, etc.).
• Lack of bylaw policing and enforcement.
• Leashed dogs on pathways.
• Speed of cyclists.
• Lack of audible passing signals.
• Cyclists passing unsafely.
• Users not staying to the right.
• Cyclists on paths after dark with no lights.
• Speed differential of cyclists (recreationalists vs. commuters).
• User distractions (headphones, etc.).
• Segways/ebikes on pathways.
• Conflicts between pathway users and homeless population.
• New users not following rules, expectations, etiquette.

Emergency response
• Bridges lack capacity to allow emergency access.
• Poor access in some areas for emergency response vehicles.
• Lack of call boxes.
• System uses street addressing to identify location – not applicable to pathways.

Planning and design of pathways
• Poor sightlines in areas (sharp corners, vegetation encroachment).
• Widths don't meet current minimum guidelines in some areas.
• Bollards and barriers can be hazardous to cyclists.
• Number and steepness of hills.
• Too many curves.
• Lack of twinning in high-use areas.
• Lack of divided pathways.
• Lack of continuity in some areas.
• Lack of continuity through industrial areas.
• Lack of well-designed pathways across bridges.
• Pathway proximity to slopes (bottom and top).
• Poor drainage in some areas.
• Pathway too close to roads with no safety barrier.
• Too many pinch points.
• Pathway connections to roads need improvement in some areas (no aprons).
• Fences or barriers with no buffer zone.
• Pathway closures and detours (not safe and easy; inadequate signage and notification).
• Lack of lighting along some popular sections.
• Balancing pathway design guidelines with field conditions.
• Harmonizing specs/standards across business units and third parties.
• Tree protection plan affecting feasibility of pathway construction (tree root zone conflict).
• Secluded pathways.
• Bridge retrofits to accommodate cyclists.
• Bridge pathways often look like sidewalks (users don't expect cyclists).

Maintenance of pathways
• Many paths get no snow removal.
• Quality of work performed by other work units and third parties (i.e. use of cold patch).
• Lack of notification from other business units regarding work done on pathways.
• Vegetation overgrowing signs and pathway edges.
• Lack of sanding on priority two pathways.
• Clean access to path required (road, sidewalk and walkway snow not removed).
• City vehicles parked on/using pathways.

Condition of assets
• Condition of asphalt in some areas.
• Tree roots in some areas.
• Bollards missing; broken.
• Garbage cans, benches and other assets too close to path.
• Uneven asphalt surface at some connections (bridges, sidewalks, etc.).
• Some bollards non-reflective.
• Signage in or near off-leash areas.
• Uneven rail crossings.

In addition to the stakeholder groups already noted, the general public was engaged to provide their perceptions about pathway safety, including identifying those aspects of the pathway system they consider the most unsafe. In 2010, a private consulting company conducted three separate public surveys (telephone, online, intercept). More details on these surveys and engagements components will be discussed in the section on public engagement. In this section, two components of the surveys are referenced: "Feeling of safety by activity" and "Most unsafe component of pathways."

Among those who participate in each particular activity (cycling, walking, jogging and in-line skating), the perception of safety on pathways is very high with at least 90 per cent of all saying they felt very or somewhat safe. The exception is with in-line skating which has a slightly lower safety perception of 82 per cent. These results as seen in Table 2 are similar to those recorded for the 2002 Pathwatch Intercept Survey.

Table 2 – Feeling of safety by activity

Base = among those who participate in activity	Telephone 2010	Online 2010	Intercept 2010	Intercept 2002
Cycling	97%	92%	93%	96%
Walking	95%	90%	94%	93%
Running/jogging	95%	92%	94%	95%
In-line skating	82%	78%	85%	82%

There is consensus among all three survey populations that the single most unsafe factor about Calgary's pathways is not the system itself, but the actions and behaviours of the users on it. The online population is more critical of the pathways; especially of the poor conditions, and poor design and location. Table 3 presents the results from the three different public surveys.

Table 3: Most unsafe component of pathways

Components	Telephone (n=445)	Online (n=2,445)	Intercept (n=512)
Actions/behaviours of users	69%	62%	72%
Poor conditions of pathways	10%	13%	10%
Poor design and location	4%	13%	3%
Poor signage	3%	4%	5%

There is considerable agreement between our stakeholder groups and the three public surveys. The actions/behaviours of users are the major safety issue followed by the need to improve planning and design of pathways and the condition of the pathways in some areas.

2. Public use

The City conducted observation research on Calgary's pathway system in both 2002 and 2010. In 2002, we collected comprehensive hourly data at 39 sites along the pathways. The data included demographic information, activities on the pathways, direction travelled and bylaw compliance.

2.1 2010 pathway observations

In 2010, The City engaged a private consulting company to do observation research on the pathway system. The exact same methodology as 2002 was used, but only 15 sites were chosen. The 15 sites chosen were also analyzed in 2002, so a comparison could be made. These included:

- Nose Creek at Confluence Park
- Nose Creek at 16th Avenue N.E.
- Nose Creek at junction with Bow River
- Talisman Centre (Lindsay Park)
- North Glenmore Park near Weaselhead
- Near Glenmore Sailing School (24th Street and 90th Avenue S.W.)
- 37th Street and 93rd Avenue S.W.
- Confederation Park at 10th Street N.W.
- Eau Claire
- South Bow Pathway at 9A Street N.W. LRT Bridge
- North Bow Pathway at bridge to Prince's Island
- Baker Park
- North Bow Pathway at Edworthy Park
- Southland Park
- Mackenzie Bridge

In both reports, each site was observed for 60 hours over the course of five days (three weekdays and two weekend/holiday days). All observations were made for 12 consecutive hours between 7:00 a.m. and 7:00 p.m.

Here is a summary of findings from the 2010 observation research:

- 133,858 observations were recorded over the four-week course of this study.
- On average, observers counted 149 pathway users per hour.
- Overall averages at each site range from 21 pathway users an hour in a quiet residential area to 627 pathway users an hour at a popular downtown park and market.
- On weekdays, an average of 164 pathway users per hour was observed.
- On weekend/holiday days, an average of 127 pathway users per hour was observed.
- On average, most pathway users were walking (67,888 observations, 50.7% of total), followed by cycling (37,733, 28.2%) and running (22,101, 16.5%).
- Of the 37,733 cyclists, 28,477 (75.5%) were wearing a helmet while 8,274 (21.9%) were not. (2010 observation research only observed helmet use among cyclists, compared to all users on wheels in previous studies.)
- 6,578 users were observed with a dog or dogs (4.9% of observations).
- The majority of pathway users observed were male (73,731, 55.1%) versus females (56,725, 42.4%).
- Not unexpected, the majority of pathway users observed were adults (112,910, 84.4%), followed by children (8,522, 6.4%), seniors (7,687, 5.7%) and youth (4,021, 3.0%).

2.2 Other Pathwatch studies

Observation research has been done on the pathway system since 1994. There have been three summer user counts (1994, 2002, 2010), and two winter counts (1999, 2006/2007). The table below is intended to provide an overview of all Pathwatch studies.

Table 4: Pathwatch studies

	Summer Pathwatch 2010	Summer Pathwatch 2002	Summer Pathwatch 1994	Winter Pathwatch 2006/2007	Winter Pathwatch 1999
Overall average per hour	149	119	118	119	29
Weekday average per hour	164	115	118	121	Not measured
Weekend* average per hour	127	125	111	115	Not measured
Walking	50.7%	43.4%	29.3%	58.6%	53.0%
Running	16.5%	11.3%	10.9%	25.2%	14.5%
Cycling	28.2%	37.9%	53.2%	14.3%	30.7%
In-line skating	1.1%	6.3%	5.6%	0.1%	1.7%
Users with dogs	4.9%	4.3%	2.0%	4.6%	Not measured
Male	55.1%	58.3%	62%	52.9%	58.7%
Female	42.4%	39.5%	36%	40.7%	38.5%
Unknown gender	2.5%	2.2%	–	6.4%	2.8%
Adult	Adult, 84.4% Seniors, 5.7%	Adult, 83.4% Seniors, 4.1%	Unknown	94.6%	88.3%
Child	Child, 6.4% Youth, 3.0%	Child, 5.7% Youth, 5.9%	Unknown	3.8%	11.3%
Unknown age	0.5%	–	–	1.6%	0.4%

* Included Labour Day (Monday, September 6, 2010)

The sites are not always comparable between studies, therefore no direct comparisons should be made. Nonetheless, there are some definite trends in usage on Calgary's pathways:

1. Volume of use is increasing.
2. Diversity of use is increasing.
3. Percentage of walkers, runners and users with dogs is increasing.
4. Percentage of cyclists and in-line skaters is decreasing.
5. Percentage of male users is decreasing and percentage of female users is increasing.
6. Percentage of different age groups is remaining fairly stable with adults predominant.

2.3 Annual Citizen Satisfaction surveys

Pathways are rather unique in Calgary. Unlike other cities, pathways are set up as their own category within the Ipsos-Reid Annual Citizen Satisfaction surveys. The pathway system is consistently rated very high in both importance and satisfaction.

Table 4 shows the past five years of Ipsos-Reid findings on how the citizens of Calgary rate the importance of Calgary's pathway system and their satisfaction with the system.

Table 5: Summary of Calgary's Citizen Satisfaction surveys from 2006 to 2010 regarding Calgary's pathway system.

Year	Importance of pathway system	Satisfaction with pathway system
2010	90%	91%
2009	90%	93%
2008	89%	92%
2007	87%	91%
2006	88%	93%

3. Public concerns/contacts

The number of public concerns/contacts tracked and recorded through The City of Calgary's 3-1-1 public information line has remained fairly consistent over the past three years with 692 in 2008, 664 in 2009 and 978 in 2010. The concerns/contacts went up in 2010 due in large part to a significant increase in the number of requests for pathway maps.

On average, there were 778 concerns/contacts per year. Considering there are roughly 700 km of pathway in our city of over 1 million people, this seems reasonable. The number of 3-1-1 concerns/contacts is roughly 1 per kilometre of pathway or 0.07 per cent of the population of Calgary. A number of the 3-1-1 concerns/contacts are not safety related.

The most frequently cited concerns/contacts related to snow and ice removal. These complaints have increased slightly each year from 2008 to 2010, from 166 to 237. Snow and ice related complaints generally fall into two categories: the need for better maintenance (25%) or a request to remove snow and ice from pathways that are not currently cleared (60%). The remainder of the 3-1-1 concerns/contacts related to snow and ice involved walkways or sidewalks, not pathways.

The top eight safety-related categories have remained steady and largely consistent in number from 2008 – 2010.

In order from highest to lowest number of complaints they are (2008, 2009, 2010):

1. Snow/ice removal (166, 196, 237)
2. Debris/gravel on pathway (51, 74, 69)
3. Cracks/potholes/tree roots (53, 40, 37)
4. Posts/gates (40, 39, 39)
5. Signage – missing/request for new (30, 31, 34)
6. Overgrown trees/bushes/vegetation (25, 19, 30)
7. Drainage/water concerns/water pooling (24, 19, 32)
8. Erosion (28, 17, 21)

Other types of safety-related complaints received in very low numbers include handrails/guardrails, bridges/stairs, lights, and dogs as shown in Table 6. It should be noted that most dog complaints go directly to Animal and Bylaw Services.

On average, 65 per cent of all pathway concerns/ contacts have safety implications.

Table 6: 3-1-1 pathway statistics 2008 – 2010

2008	#	2009	#	2010	#
Snow/ice removal	166	Snow/ice removal	196	Map for pathways	295
Closures/detours	109	Closures/detours	94	Snow/ice removal	237
Debris/gravel on pathway	74	Debris/gravel on pathways	51	Closures/detours	99
Request new/missing pathway	58	Request new/missing pathway	43	Debris/gravel on pathways	69
Cracks/potholes/tree roots	53	Cracks/potholes/tree roots	40	Request new/missing pathway	45
Posts/gates	40	Posts/gates	39	Posts/gates	39
Signage/missing/request new	30	Map for pathways	37	Cracks/potholes/tree roots	37
Erosion	28	Signage/missing/request new	31	Signage/missing/request new	34
Overgrown trees/bushes/ vegetation	25	Overgrown trees/bushes/ vegetation	19	Water pooling	32
Drainage water concerns	24	Erosion	17	Overgrown trees/bushes/ vegetation	30
Map for pathways	6	Water pooling	13	Erosion	21
Handrail/guardrail	4	Drainage water concerns	6	Handrail/guardrail	5
Bridge/stairs	4	Handrail/guardrail	4	Bridge/stairs	4
Fences	2	Bridge/Stairs	3	Pathway between houses	3
Pathway between houses	1	Pathway between houses	3	Garbage can overflowing	2
Light	1	Garbage can overflowing	1	Dog concern	1
Other	67	Grafifiti	1	Fences	1
		Other	66	Light	1
				Other	23
2008 Annual total	**692**	**2009 Annual total**	**664**	**2010 Annual total**	**978**

4. Public engagement

In 2010, The City hired a private consulting firm, NRG, to perform surveys on the users of Calgary's pathway system. The surveys consisted of a telephone survey, an online survey and an Intercept survey. Where applicable, the 2010 Intercept survey results are compared to the 2002 Intercept survey results.

The methodology and key findings are described herein. The findings relate to reasons for pathway usage, frequency of use, familiarity with pathway regulations, perceptions of safety from accidents, suggestions for improvements, perceptions of pathway quality and value, as well as user and non-user profiles.

4.1 Methodology used in surveys

Telephone survey

NRG administered the telephone survey to 500 randomly selected Calgarians between August 19 and August 27, 2010. Up to 10 call-backs were made to all non-response numbers prior to retiring the number from the sample. Of the three data collection methods used in the 2010 pathways research, the telephone survey is considered the most accurate in terms of representing Calgary's population overall (both pathway users and non-users). The results are reflective of the views of Calgary's population as a whole. The maximum margin of error associated with the total sample of 500 is +/-4.4 per cent at the 95 per cent level of confidence.

Online survey

This online survey was designed to allow stakeholders and special interest groups to voice their opinions on Calgary's pathway system. It was open and available to anybody to complete. Furthermore, there were no controls put in place to stop people from completing the survey more than once, if they chose to respond multiple times. Accordingly, results are not deemed representative of the population as a whole.

The online survey was available from August 18 to September 17, 2010. A total of 2,452 surveys were completed during that time with 2,445 of those completed by pathway users. Participants of the online survey tend to be much heavier users of the pathway system with 84 per cent using the pathways weekly or more, compared to 51 per cent among the representative telephone sample.

As well, 40 per cent of online survey respondents indicated using the pathways mainly for commuting, compared to just 12 per cent of the representative telephone sample. Accordingly, the results of this online survey are reflective of the opinions of highly involved users and advocates of Calgary's pathway system with a bias towards cycling and commuting.

Intercept survey

On-site intercepts were conducted at 15 selected sites on pathways between August 18 and September 17, 2010. For those pathway users who did not have time to complete the interview at the time of intercept, they were provided with a paper copy of the survey and instructed to complete the survey online or as a mail-in survey. In total, 529 surveys were completed.

Where possible, every user who passed the interviewer was approached and asked to participate in the study. Participation rates were similar among various types of pathway users (e.g. walkers, dog walkers, in-line skaters, etc.), with the exception of cyclists, who were more difficult to reach as some were moving too fast to approach. "Survey in progress" signs were used to inform users – cyclists in particular – that a survey was being conducted. During bad weather and commuting times, people were less receptive to completing the survey at the time of interception.

The results of the intercept survey are not representative of all pathway users, but only of a small group of pathway users. Given this limitation, it is not recommended that the results be associated with margins of error.

4.2 Summary and comparison of survey findings

a) Demographic user profile

Table 7: Demographics of survey participants

	Telephone (n=500)	Online (n=2,452)	Intercept (n=528)	2002 Intercept (n=1,029—1,031)
Residence				
Calgary	100%	100%	95%	97%
Northwest	34%	41%		
Northeast	14%	8%		
Southwest	29%	37%		
Southeast	23%	13%		
Non-Calgary	–	–	5%	3%
Gender				
Male	49%	60%	49%	59%
Female	51%	35%	51%	41%
Refused	–	4%	–	–
Age				
18-24	11%	3%	6%	6%
25-34	23%	23%	15%	21%
35-44	18%	25%	16%	28%
45-54	24%	22%	27%	27%
55-64	12%	13%	24%	11%
65+	12%	6%	12%	7%
Refused	–	8%	–	–

b) Top reasons for use

The four most common reasons for using The City's pathway system are similar across each of the three samples: exercise, recreation, walking a dog and commuting.

However, while the telephone and intercept samples put exercise as the most common use of the pathways, followed by the other three activities, the primary reason for use among the online sample is commuting, followed by exercise.

Table 8: Most common reason for using pathways

	Telephone (n=445)	Online (n=2,445)	Intercept (n=528)
Exercise	34%	35%	43%
Recreation	22%	11%	12%
Dog walking	18%	7%	16%
Commuting	12%	40%	14%

c) Activities on pathways

Table 9: Activities on pathways

	Telephone (n=445)			Online (n=2,445)		
	Most	Other	Total	Most	Other	Total
Walking	51%	29%	80%	20%	50%	70%
Cycling	18%	29%	47%	54%	26%	80%
Nature observation	2%	30%	32%	1%	26%	27%
Dog walking	18%	11%	29%	8%	13%	21%
Running	7%	21%	28%	14%	27%	41%
In-line skating	2%	7%	9%	1%	10%	11%

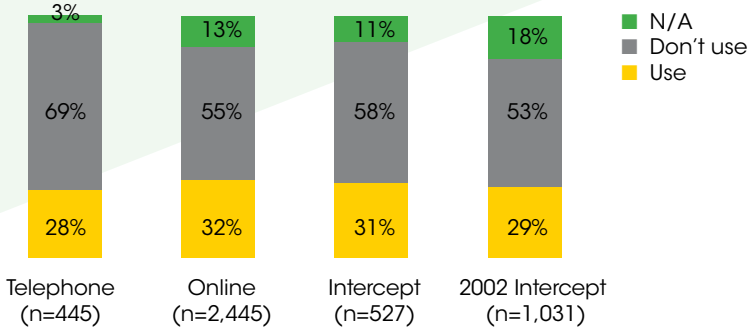
Walking is the most broadly participated in activity on the pathways for the telephone and intercept participants, followed by cycling. However, for the online participants, the reverse is true: cycling is the most common, followed by walking. Online participants are also more likely to use the pathways for running. Other activities enjoyed by pathway users include nature observation and dog walking.

The 2010 user observations on the pathway system confirmed that walking is the most common activity (50.7%), followed by cycling (28.2%) and running (16.5%). Combining activities, the "heeled" activities made up 70.7 per cent of pathway use; the wheeled activities (cycling and in-line skating) 29.3 per cent.

d) Use of off-leash dog areas

Use of the off-leash areas in the city is fairly consistent across the three samples, ranging from 28 to 32 per cent. Results are also consistent with the 2002 pathways results where 29 per cent indicated use of off-leash areas.

Figure 2 - Use of off-leash areas



e) Pathway usage patterns

The pattern of usage between the three samples, and compared to the 2002 results, is similar. The summer months of June, July and August have the highest usage, followed by the shoulder months of April, May, September and October. The winter months of November through March are the least used months.

Although the number of users is higher during the peak summer months, this period sees a lower average frequency of use. Conversely, while the winter months see fewer users, those who do use it during this time do so much more frequently. This pattern is consistent across the three survey samples.

Table 10: Pathway usage by month

	Telephone (n=500)	Online (n=2,452)	Intercept (n=528)	2002 Intercept (n=1,029—1,031)
Peak season average	83%	95%	93%	95%
June	78%	96%	94%	93%
July	87%	94%	94%	96%
August	83%	95%	91%	97%
Shoulder season average	46%	83%	81%	77%
April	35%	74%	72%	67%
May	53%	90%	85%	85%
September	58%	92%	91%	87%
October	36%	75%	76%	70%
Winter season average	19%	41%	53%	46%
November	22%	47%	57%	50%
December	18%	36%	51%	43%
January	18%	35%	49%	42%
February	17%	37%	50%	43%
March	20%	51%	56%	51%

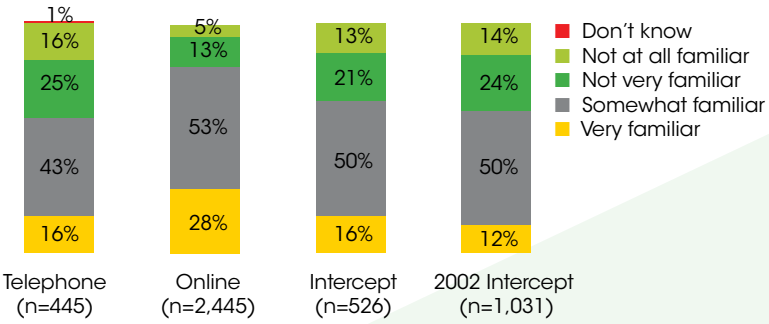
Table 11: Average monthly usage

	Telephone (n=500)	Online (n=2,452)	Intercept (n=528)
Peak season			
Average usage per month	83%	95%	93%
Average times used during month	11	19	19
Shoulder season			
Average usage per month	46%	83%	81%
Average times used during month	12	21	21
Winter season			
Average usage per month	19%	41%	53%
Average times used during month	15	24	23

f) Familiarity with bylaws

Among pathway users, there is a relatively high familiarity with pathway bylaws. More than half of each sample group stated they are either "somewhat" or "very" familiar. The current results are also very similar to the 2002 results. Familiarity increases with age and frequency of use. As such, the online sample is the most familiar with the bylaws as they are the heaviest users.

Figure 3 - Familiarity with bylaws



g) Important bylaws to follow

For those with at least a little familiarity, bylaws concerning cycling are considered to be the most important regulations to follow. Specifically, staying on the right-hand side of the pathway had the highest mentions among all samples, followed by maintaining speed limits and using audible signals when passing.

Pathway users from the online sample are less likely to believe speed limits are an important bylaw to follow.

With respect to dogs on the pathways, there is a general consensus that keeping dogs on a leash and under control is important.

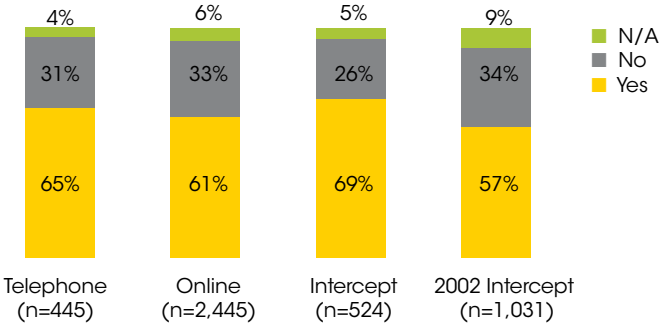
Table 12: Important bylaws to follow

Base: Those who are at least a little familiar with bylaws	Telephone (n=372)	Online (n=2,328)	Intercept (n=448)
Staying to right-hand side of pathway	81%	86%	76%
Speed limits	73%	50%	68%
Dogs under control	73%	67%	69%
Dogs on leash	72%	60%	60%
Giving audible signal when passing	70%	77%	74%
Lights/reflectors at night	65%	48%	39%
Yield/intersection	62%	46%	40%
Staying on proper path	60%	64%	55%
Use of cell/headphones	33%	32%	23%

h) Believe in enforcing pathway regulations

Regardless of the sample, the majority of pathway users agree bylaw regulations need to be enforced. This belief is stronger now than it was in 2002.

Figure 4: Believe in enforcing pathway regulations



I) Pathway rules and other information

Across all three samples, the most preferred way of receiving pathway information was on the pathway and bikeway map. Pathside information booths were the second preferred way for the intercept and online sample, followed by the Internet. For the telephone sample, the Internet was the second preference.

The pathway and bikeway map was also the preferred source in 2002, although to a lesser degree, and brochures had a higher preference level than in 2010.

Table 13: Preferred method of receiving information

	Telephone (n=445)	Online (n=2,445)	Intercept (n=519)	2002 Intercept (n=1,008)
On pathway/bikeway map	57%	63%	65%	49%
Internet	51%	41%	33%	27%
TV	46%	27%	32%	28%
Radio	45%	25%	28%	28%
Newspaper	40%	26%	33%	38%
Pathside info booth	39%	47%	47%	31%
Brochure at bike shops or other stores	35%	29%	33%	43%

J) Perception of safety

Among those who participate in cycling, walking, or jogging, the perception of safety on pathways is very high with at least 90 per cent of all users saying they feel "very" or "somewhat" safe.

The exception is for in-line skating, which has a slightly lower safety perception of 82 per cent. These results are similar to those recorded in 2002.

Table 14: Feeling of safety by activity

Base: Among those who participate in activity	Telephone	Online	Intercept	2002 Intercept
Base	n=371	n=2,155	n=370	n=841
Cycling	97%	92%	93%	96%
Base	n=442	n=2,297	n=488	n=953
Walking	95%	90%	94%	93%
Base	n=340	n=1,558	n=268	n=585
Running/jogging	95%	92%	94%	95%
Base	n=230	n=736	n=107	n=359
In-line skating	82%	78%	85%	82%

k) Most unsafe aspect of pathways

There is consensus among all three samples that the single most unsafe factor about Calgary's pathways is not the system itself, but the actions and behaviours of the users on it.

The online sample is more critical of the pathways, specifically citing poor conditions, poor design and location.

Table 15: Most unsafe aspect of pathways

	Telephone (n=445)	Online (n=2,445)	Intercept (n=512)
Actions/behaviours of users	69%	62%	72%
Poor conditions of pathways	10%	13%	10%
Poor design and location	4%	13%	3%
Poor signage	3%	4%	5%

l) Actions to improve safety

While there is consensus among the three samples in terms of the most unsafe factor about the pathway system, there is less agreement in terms of what would improve safety. Respondents in the telephone survey sample believe more education of regulations is the action that would most improve safety on the pathways, followed by more enforcement of regulations, more twin paths and widening paths. Intercept respondents feel that more education and enforcements of regulations would equally improve safety the most, followed by more twin paths. Online respondents, however, clearly believe more twin paths is the answer to improved safety.

Table 16: Actions to improve safety

	Telephone (n=445)			Online (n=2445)			Intercept (n=516)		
	Most	Other	Total	Most	Other	Total	Most	Other	Total
More education of regulations	26%	16%	16%	16%	24%	45%	21%	24%	45%
Widen paths	16%	14%	14%	14%	17%	29%	12%	17%	29%
More enforcement of regulations	17%	15%	15%	15%	15%	37%	22%	15%	37%
More twin paths	17%	35%	35%	35%	20%	38%	18%	20%	38%
More posted signs	7%	4%	4%	4%	15%	23%	8%	15%	23%
Better maintenance/repair	9%	9%	9%	9%	13	20%	7%	13	20%

5. Condition of pathway surface

Each year, Parks staff perform a formal inspection on the pathway system in Calgary. Each segment of the pathway system is analyzed for the following deficiencies: tree root/frost heaving damage; cracking or alligatoring of the surface; potholes; breaking edge; vegetation encroachment and water ponding. Criteria are set up within each one of these deficiencies to allow staff to rate the segment as green, yellow, or red. See Table 17 for descriptions of the coloured ratings.

Table 17: Asset condition assessment

Grade	Condition	Description	Life cycle strategy
1	Red flag	Failed or failure imminent. Immediate need to replace most or all of asset. Health and safety hazards exist which present a possible risk to public safety, or asset cannot be serviced/operated without risk to personnel.	Disposal and replacement
2	Yellow flag	Significant deterioration evident. Failure likely in the near future. Components or isolated sections of the asset need replacement or repair now. Asset still functions safely at adequate level of service, but work required in near future to ensure asset remains safe.	Refurbish
3	Green flag	Sound to acceptable physical condition. Zero to minimal short-term failure risk. Zero to minor work required.	Maintenance

While money is set aside for lifecycle maintenance in the annual capital budget, the amount allocated has not kept pace with the tremendous growth of the pathway system over the past two decades. The development industry in particular, has been actively constructing pathways in all new communities since the mid 1990s, and the forecasted life of asphalt is 15 years. Table 18 illustrates the growth over the last five years.

Table 18: Annual pathway surface condition ratings 2006 – 2010

	2006	2010
Kilometres of pathway	609	712
% pathways flagged Red Kilometres in Red	4% 24.4 km	5% 35.6
% pathway flagged Yellow Kilometres in Yellow	10% 60.9	23% 163.8

Experience tells us that those segments of Calgary's pathway currently rated as Yellow condition will move to a Red condition in one to five years. This span is due to a variety of variables (e.g. amount of adjacent tree growth, weather, amount of vehicle traffic-maintenance, emergency vehicles, utility companies).

An increase in both capital and operating funds is needed to keep pace with the aging and growing pathway system.

6. Assessment of pathway system infrastructure components

In 2010, The City conducted an assessment of Calgarys pathway system using The City of Calgary Parks' "Development Guidelines and Standards Specifications – Landscape Construction 2010." This document details current planning and design guidelines and specifications for pathways.

Field staff gathered this data over several months in 2010. Each segment of pathway was assessed using every category and criteria in the Development Guidelines and Specifications, so there is a complete picture or assessment on each pathway segment. Table 19 outlines the components and criteria assessed, and summarises and quantifies the results.

Table 19: 2010 Assessment of pathway system infrastructure components

	Criteria	Results/conclusions
1) Landscaping		
1. Edges	Is the ground adjoining the path (shoulder) level with the path surface? Consider both edges. G->65%, Y-40 to 65%, R-<40%	110 segments rated Red (1.6%) = 12,023m 269 segments rated Yellow (4.1%)= 29,401m 6,135 segments rated Green (94.3%)= 670,576m
2. Encroaching Vegetation	Trees or shrubs within the 1.0m min. horizontal No Encroachment Zone, and/or 3.0m min. vertical No Encroachment Zone? G – Vegetation not within No Encroachment Zone. Y – Vegetation attention required, pruning possible solution. R – Vegetation, accept as is or removal only solution.	104 segments rated Red (1.6%) 2,477 segments rated Yellow (38.0%) 3,933 segments rated Green (60.4%)
2) Alignment and cross section		
1. Curves	Sections of path which may cause confusion for users (i.e. Is alignment of path clearly defined, particularly at unexpected curves?). G – Curves appropriate signs in place, or curves present, no signs required. Y – Curves, curve signs required. R – Curves, curve sign, speed reduction sign required.	18 segments rated Red (0.3%) 57 segments rated Yellow (0.9%) 6,439 segments rated Green (98.8%)
2. Widths	Does the path width meet the current minimum 2.0m for local, 2.5m for regional, 3.5m for river, 2.5m for each twinned? G – Meets minimums. Y – Fails to meet min. but no choice due to available area. R – Fails to meet minimum, requires attention.	787 segments rated Red (12.1%)= 86,019m 273 segments rated Yellow (4.2%)= 29,838m 5,454 segments rated Green (83.7%)= 596,143m

	Criteria	Results/conclusions
3. Hills	G – Hill <3%, or hill >3% and <8% c/w steep hill sign. Y – Hill present >3% and <8%, no steep hill sign. R – Hill >8% no signs, steep hill and speed reduction signs required.	926 segments rated Red (14.2%) 1,034 segments rated Yellow (15.9%)
4. Blind corners	Unlike curves, are there blind corners present that may cause concern to users of the path? G – Blind corner, appropriate signs in place. Y – Blind corner, no signs, but escape route available R – Blind corner, no signs, and no escape routes available.	88 segments rated Red (1.4%) 134 segments rated Yellow (2.1%)
5. Drop off slopes	Protection is required when a pathway is within 2.0m of the top of a 2:1 slope or steeper slope and the slope is > than 1.0m in depth. G – Drop-off slopes, all barriers in place. Y – Drop-off slopes, inadequate barriers in place. R – Drop-off slopes, no barriers in place.	165 Segments rated Red (2.5%)= 18,034m 34 Segments rated Yellow (0.5%)= 3,716m
3) Intersections		
1. Location	Are the intersections located safely with respect to horizontal and vertical alignment of the path? G – Intersection at 90 degrees. Y – Intersection not at 90 degrees, but acceptable, due to good sightlines. R – Intersection not at 90 degrees, not acceptable, due to poor sightlines.	17 segments rated Red (0.3%) 2,216 segments rated Yellow (34.0%)
2. Warnings and visibility	Presence of intersection obvious to path users? Is sight distance adequate for movements and all users? Ensure no obstructions to visibility within 5m of junction with other paths, and streets (trees, shrubs, utility boxes, fences, etc.). G – Visibility obvious. Y – Visibility not obvious, obstructions are > 5m of intersection. R – Visibility not obvious, obstructions within 5m of intersection.	45 segments rated Red (0.7%) 14 segments rated Yellow (0.2%)

	Criteria	Results/conclusions
3. Intersections with roads	At intersections with roads, are there appropriate facilities (e.g. wheelchair ramps, curb cuts, underpass, overpass, or median refuge) to allow users to cross safely? G – Pathway complete with wheelchair ramp and/or curb cuts present Y – Local pathway without wheelchair ramp and/or curb cuts present, requires attention, no threat pending. R – Regional pathway, no wheelchair ramp and/or curb cuts present. Requires immediate attention, immanent threat pending.	173 segments rated Red (2.6%) 124 segments rated Yellow (1.9%)
4. Bollards	Is bollard metal, painted white with red stripe? G – Bollard is metal and painted white with red stripe. Y – Bollard is not painted white with red stripe (or graffiti). R – Bollard is not metal, or missing and needs to be installed.	113 segments rated Red (1.7%) 128 segments rated Yellow (2.0%)
5. Bridges	Is the transition from the pathway to the bridge safe (e.g. pavement condition, ramps, railings, signs, etc.)? G – Bridge transition good, appropriate signage in place. Y – Bridge transition surface uneven. R – Bridge transition uneven; inadequate ramps, railings, or signs.	37 segments rated Red (0.6%) 32 segments rated Yellow (0.5%)
4) Lighting, center lines and illumination		
1. Lighting	Is appropriate lighting installed, particularly at tunnels, underpasses? G – Lighting present and sufficient. Y – Lighting present but not sufficient. R – No lighting; lighting required.	130 segments rated Red (2.0%) 131 segments rated Yellow (2.0%)
2. Center line markings	Are center lines present? Are center lines in need of replacement? Are center lines required? (Regional – yes, Local – no). G – Center lines present and good. Y – Center lines present but need replacing. R – Regional pathway missing center line. N/A – Local pathway not requiring center line.	1,313 segments rated Red (20.2%)= 143,510m 260 segments rated Yellow (4.0%)= 28,418m
3. Illumination	Are all fixed objects close to (within 1.0m) or on the path (trees, fences, safety rails, etc.) treated to ensure visibility at night? G – Fixed object present, properly illuminated. Y – Fixed object present, illuminated but needs attention. R – Fixed object present, needs illumination.	918 segments rated Red (14.1%) 1,921 segments rated Yellow (29.5%)

	Criteria	Results/conclusions
5) Physical objects		
1. Safety railing	Safety railings located within the recommended 1.0m No Encroachment Zone? Are the safety railings free of sharp edges or corners and forgiving to minimise the risk of injury in the event of a pedestrian or cyclist hitting them? G – Safety railing located >1.0 meter and free of concerns. Y – Safety railing located <1.0m but free of concerns. R – Safety railing located < 1.0m concerns about edges and corners. N/A – No safety railing present.	53 segments rated Red (0.8%) = 5,792m 176 segments rated Yellow (2.7%) = 19,236m
2. Fences	Are fences present and located within the recommended 1.0m No Encroachment Zone? Are the fences free of sharp edges or corners and forgiving to minimise the risk of injury in the event of a pedestrian or cyclist hitting them? G – Fences present, located >1.0m and free of concerns. Y – Fences present, located <1.0m but free of concerns. R – Fences present, located, <1.0m concerns about edges or corners.	130 segments rated Red (2.0%) = 14,209m 1,244 segments rated Yellow (19.1%) = 135,969m
3. Maze gates	Are maze gates present? Are there effective fences or other barriers in place to prevent users from bypassing the maze gates? G – Yes maze gates present complete with adequate barriers. Y –Yes maze gates present, some attention required regarding barriers. R – Yes maze gates present, barriers required at this location.	3 segments rated Red (0.05%) 20 segments rated Yellow (0.3%)

	Criteria	Results/conclusions
6) Signs		
1. Locations	Are signs in their correct locations and properly positioned with respect to lateral clearance and height (1.0m min No Encroachment Zone and min 2.1m from bottom of sign to ground)? G – Signs present, position and location all good. Y – Signs present, location good, but positioned improperly. R – Sign missing or if present, location improper.	253 segments rated Red (3.9%) 116 segments rated Yellow (1.8%)
2. Sight distance	Are signs placed so as not to restrict site distances, overgrowing vegetation, or particularly for turning manoeuvres? G – Signs present, location good, sightlines all good. Y – Signs present, location good, some concerns regarding sightlines. R – Sign missing or if present, location poor, sightlines requiring site modification	65 segments rated Red (1.0%) 25 segments rated Yellow (0.4%)
3. Condition	Are signs in good condition, clean, and free of Graffiti? G – Yes, signs present, condition all good. Y – Yes, signs present, some concerns regarding sign maintenance (i.e. cleaning or tightening). R – Sign missing or present but requires immediate replacement.	41 segments rated Red (0.6%) 89 segments rated Yellow (1.4%)

7. Education/enforcement activities

Safety is the key element in the design and maintenance of pathways. Written standards are found in the "Development Guidelines and Standard Specifications for Landscape Construction" and the "Parks Activity Manual." Public safety is upheld by conducting annual thorough pathway inspections, and by having a consistent signage program. In addition, all the clauses in the Parks and Pathways Bylaw 20M2003 pertaining to pathways relate to safety.

Information and rules taken from the above-mentioned documents are used to develop education and enforcement strategies. Education on pathway rules, or components thereof, have been and is being done by a variety of business units, including Parks, Animal and Bylaw Services and Transportation for a variety of reasons.

Education efforts have varied from written materials (e.g. Pathway and Bikeway Map, brochures, posters), to website information, education programs (Parks Pathway Patrol, bicycle clinics, Travelling Pathway Show) and displays at public forums and for private businesses.

Enforcement occurs on the pathways, but with each succeeding pathway survey, the pubic identifies it as a need and a significant way to increase public safety. In all the 2010 surveys (telephone, online and intercept), 61 to 69 per cent of public believes in the need for enforcing the pathway regulations. This closely parallels, as it should, the public's view that the most unsafe aspect of pathway is the actions and behaviours of others (ranges from 62 to 72 per cent depending on survey type).

8. Pathway falls and collisions

The quantification of falls and collisions on the pathway system is untrackable. Most are probably minor and never reported. The only data that is available comes from the Law Department, Risk Management division, who track the pathway falls and collisions reported to them.

Since 2005, the number of pathway fall and collision claims are: 2005 – two; 2006 – four; 2007– four; 2008 – four; 2009 – two; 2010 – five. Two-thirds of the falls and collisions reported relate to the condition of the pathway (asphalt) surface, or the slipperiness (ice, mud, gravel) of the surface.

9. Perspective from other cities

A questionnaire was developed to see how pathway systems in other cities compared to Calgary's. The Canadian cities that responded were Edmonton and Ottawa. American cities that responded included Seattle, Portland, Denver and Minneapolis. Six of the 10 cities invited to participate did so.

The questionnaire asked a number of questions to gain insight into their pathway infrastructure and environmental details; their users; their bylaws; management and maintenance of their systems, life cycle replacement strategies, and their current safety concerns and issues.

The following is a brief summary of the findings. Details can be found in Appendix 1.

9.1 Pathway infrastructure and environmental details

The size of the pathway systems in the different cities varied greatly from 74 km (Seattle) to over 700 km (Calgary). In fact, Calgary's system is 67 per cent of all the other six cities' pathway systems combined.

The immediate citizen population also varied drastically from 390,131 in Minneapolis to 2,700,000 in the Metro Denver area. Of the seven cities, Calgary has the third largest population, behind the Metro Denver area and Ottawa.

All the cities have a networked pathway system. In five of the seven cities, the pathways are largely asphalt. The two exceptions are Portland which has 80 per cent concrete and 20 per cent asphalt pathways, and Edmonton which has 52 per cent asphalt pathway and 48 per cent granular.

In all the cities, the pathway systems went through developed parks, natural areas and road right-of-ways. The vast majority of the pathway system in four of the seven cities is flat. Denver has some hilly sections in its western area; Edmonton has hills in its river valley; Calgary has a number of hills on its river and creek valleys as well as in the western half of the city.

In all the cities, there are a variety of structures associated with their pathway system (e.g. bridges, overpasses, underpasses, tunnels) though none to the same degree as Calgary. All jurisdictions have guidelines and/or specifications for their pathways.

9.2 Users

All cities allow all non-motorized modes (walkers, joggers, cyclists, in-line skaters, dog walkers, etc). In addition, electric assist bikes are allowed in Edmonton, Denver, Portland, Seattle and Minneapolis. Portland and Minneapolis also allow Segways on their pathway systems.

Currently, Ottawa and Calgary do not allow any motorized vehicles on their pathways, with the exception of wheelchairs for persons with disabilities.

In all cities, major users are recreationalists and people getting exercise, but all systems have commuters.

The summer season has been identified as the busiest by all jurisdictions.

The number of users varies between cities. Calgary appears to have the highest use.

All cities allow dogs on their pathway system, but they must be on a leash. In addition, all the cities surveyed have off-leash areas, but not to the same degree of Calgary's 149 sites. None of the four American cities have pathways through off-leash areas; all of the Canadian cities do, but again, not to the degree that it occurs in Calgary which has 53.3 km of pathways through off-leash areas.

9.3 Bylaws/park

All of the cities surveyed have rules or bylaws that apply to their pathway systems. Three of the cities have no speed limits (Edmonton, Seattle, Portland) but they have laws stating users must travel at reasonable (safe) speeds at all times. Minneapolis and Denver have speed limits of 10 mph and 20 mph, respectively. Ottawa and Calgary both have speed limits of 20 km/h.

9.4 Management and maintenance

Calgary is the only city that manages its pathway system as a unit. Other jurisdictions have a combination of stewards including Parks & Recreation, Infrastructure Services, Public Works, the Transportation Department and Traffic Management.

All of the cities do inspections of their pathways, but because of shared jurisdictions within a city or because the pathways are a component of some other asset (i.e. park or sidewalk maintenance), maintenance amounts are unknown.

All of the cities except Seattle do snow removal, but to varying degrees. Though at 157 km, Calgary clears more than any other city except Ottawa, it clears the smallest percentage (22%) of its entire system. Denver and Minneapolis clean their entire systems at 105 and 129 km respectively. Edmonton and Ottawa clear snow from 45 per cent and 54 per cent of their systems respectively. Again, the costs are unknown for other cities because of shared jurisdictions or combined functions. Calgary budgets $550,000 for snow clearing and ice control for the pathway sections it maintains.

9.5 Life cycle replacement

As with the maintenance budgets, Calgary is the only city that has an annual life cycle replacement budget for its pathways. Some cities don't even forecast life cycle replacement. Others tie it into the lifespan of their sidewalk system.

9.6 Safety concerns/issues

All cities have similar major issues, broadly categorized as user actions and behaviours; condition of asset; and planning and design (e.g. at grade crossings, insufficient lighting, roadway/pathway interfaces, etc.). None of the cities currently have a way of effectively tracking accidents on pathways, but most are attempting to keep track to some degree.

The surveyed cities use a variety of means to address safety on their pathway systems. Different cities emphasize different components, but all cities use more than one strategy.

Some safety components include:

- Ensuring safety is a key element in development of design guidelines and specifications as well as bylaws.
- Comprehensive sign program.
- Variety of educational initiatives (from brochures to personal programs).
- Formal inspection process.
- Regular life-cycle replacement program.
- Targeted enforcement.

Section III – CONCLUSIONS & RECOMMENDATIONS

1. Pathway surface infrastructure

To address the current pathway infrastructure condition, as well as future aging and growth of the system, it is recommended to budget life cycle replacement at 3 per cent of the asset.

This would mean establishing a budget of approximately $4 Million/year for the next decade. With slower anticipated growth, this amount should reduce the percentage of pathway deficiencies over the next decade.

2. Additional pathway system infrastructure improvements

The recommendations and strategies in this category are a result of the findings of the planning/design assessment. The assessment investigated existing pathway system assets, excluding the surface, to quantify and qualify the deviation from the current "Development Guidelines and Standard Specification for Landscape Construction."

It is important to note that while the pathway system in Calgary started in 1974, there were no guidelines and specifications in place for them or any of their ancillary assets until 1991. Even then, these early guidelines were sparse, and it was not until 1993 that some comprehensive guidelines and specifications were developed. Subsequently, The City of Calgary Parks and the Urban Development Institute have collaborated in the review and updating of the Landscape Guidelines and Specifications. The guidelines and specifications all relate to a level of consistency that supports sound asset management and public safety.

Table 19 listed the components, criteria and results of looking at a number of pathway system components. In addition, the GIS work identified a number of Parks assets within the 1 meter No Encroachment Zone from the edge of the pathway.

Table 20 gives the recommendations, implementation strategy and funding requirements to enhance safety on the pathway system. The total cost is approximately $8 million in 2011 dollars, with the work to ideally be spread over the next decade. Approximately half of this cost ($4 million) is associated with safety issues around off-leash dogs.

Implementation timelines were identified as Short-term (2012 to 2014); Mid-term (2015 to 2017); and Long-term (2018 to 2021).

Table 20: Recommendations for improving safety on pathway system infrastructure

Pathway system component	Evaluation	Recommendations	Implementation strategy	Estimated Costs 2011
Ground adjoining pathway edge	1.6% Red (12,023m) 4.1% Yellow (29,401m)	Each segments rated Red should be addressed. Segments rated Yellow to be reviewed and repaired as capital life cycle work or repairs done.	Short-term Mid-term	$50,000 $0 (to be incorporated at time of capital life cycle work or repair work)
Encroaching vegetation	1.6% Red (11,367m) 38% Yellow (270,736m)	Red locations to be distributed to Urban Forestry and Parks' district supervisors to incorporate in work plans. Yellow locations to be distributed to Urban Forestry and district supervisors, and sites prioritized for actions.	Short-term Short- to mid-term	$0 (completed with Urban Forestry maintenance budget) $0 (completed with Urban Forestry and district maintenance budgets)
Curves	0.3% Red (18 segments) 0.9% Yellow (57 segments)	Appropriate signage to be installed at these sites. Look at redesign at curves when pathway life cycled.	Short-term	$15,000
Widths	12.1 % Red (787 segments; 86,019m) 3.8% Yellow (273 segments; 29,838m)	Pathway widths to be increased as Red segments are life cycled or major repairs occur.	Short- to long-term	$0 (costs included in pathway life cycle surfacing costs)
Hills	14.2% Red (926 segments) 15.9% Yellow (1,034 Segments)	Appropriate signage to be installed at these locations.	Short-term	$185,200
Blind corners	1.4 % Red (88 segments) 2.1 % (134 segments)	Appropriate signage to be installed at these locations.	Short-term	$44,400
Drop-off slopes	2.5% Red (18,034m) 0.5% Yellow (3,716m)	Appropriate barriers to be installed at Red locations. Barriers to be repaired at Yellow location.	Short-term Short-term	$721, 360 (at $40/m) $0 (done with Pathway Maintenance Budget)
Intersection Design	0.3 % Red (17 segments) 34.0% Yellow (2,216 segments)	Repair Red intersections Repair Yellow intersection as opportunities a use during pathway life cycle work or major maintenance repair work.	Short-term Short- to long-term	$17,000 $0

Pathway system component	Evaluation	Recommendations	Implementation strategy	Estimated Costs 2011
Intersection warning and visibility	0.7 % Red (45 segments) 0.2% Yellow (14 segments)	Correct visibility concerns at intersection rated Red. Review Yellow visibility concerns at intersections in conjunction with pathway life cycle or major repair work.	Short-term Short- to long-term	$100,000 $ 0
Intersections with Roads	2.6% Red (173 segments) 1.9 % Yellow (124 segments)	Parks to work with Roads to evaluate Red and Yellow at each site, determine priorities and develop joint work plan.	Short- to long-term	$ 900,000
Bollards	1.7 % Red (113 bollards) 2.0 % Yellow (128 bollards)	Repair/replace all bollards identified as Red or Yellow.	Short- to mid-term	$120,500
Bridge/pathway transition	0.6% Red (37 segments) 0.5% Yellow (32 segments)	Work with TI to determine solutions at interface areas.	Short- to long-term	$140,000
Lighting at tunnels and underpasses	2.0% Red (130 segments) 2.0% Yellow (131 segments)	Work with TI at all identified Red sites to make final determination of what lighting is required. Work with TI to enhance lengthy at all Yellow sites.	Mid-term Mid- to long-term	$50,000 consulting fees $ 262,000
Center line markings on Regional pathway	20.2 % Red (143, 510m) 4.0% Yellow (28,418m)	Paint lines where required on all Regional pathways	Short- to mid-term	$ 345,000 ($2/m)
Fixed objects within 1.0m of pathway	908 benches 618 garbage containers	Move garbage containers further back from pathway edge. Move benches further back from pathway edge as follows: * Those at bottom of hills or on curves. * All others as either pathway or benches are life cycled.	Short- to mid-term Short-term Short-long	$ 0 (Work to be done by Parks Grounds Maintenance) $30,000 (100 x $300) $0
Illumination of objects with1.0 m pathway	14.1 % Red (918 segments) 29.5% Yellow (1,921 segments)	Appropriate type of illumination to be determined for all types of objects.	Short- to long-term	$283,900 ($100 per object)

Pathway system component	Evaluation	Recommendations	Implementation strategy	Estimated Costs 2011
Existing safety railings	0.8 % Red (5,792 m) 2.7% Yellow (19,236m)	Railings rated Red to be repaired. Yellow rated railings to be reviewed as pathway life cycle.	Short-term Short- to long-term	$120,000 ($20/m to repair) $0 (to be included as part of life cycle costs)
Fences	2.0% Red (14,209 m) 19.1% Yellow (135,969m)	Fences rated Red to be repaired. Yellow rated fences to be reviewed as pathway life cycle.	Short-term Short- to long-term	$497,315 ($35/m) $0 (to be included as life cycle)
Barriers adjacent to maze gates	0.05 % Red (3 segments) 0.3% Yellow (20 segments)	Repair barriers adjacent to maze gates to ensure all traffic flow goes through gates.	Mid-term	$8,000 ($350/site)
Sign locations	3.9% Red (253 locations) 1.8% Yellow (116 locations)	Relocate all signs in Red locations. Reposition all signs on supports at Yellow locations.	Short-term Short– to mid-term	$50,600 ($200 each) $0 (to be completed by pathway maintenance crews)
Sight distance for signs	1.0% Red (65 segments) 0.4% Yellow (25 segments)	Modify sightlines at; *Red sites *Yellow sites	Short-term Mid- to long-term	$32,500 $12,500
Condition of signs	0.6% Red (41 signs) 1.4% Yellow (89 signs)	Replace Red condition signs Repair (clean, tighten, etc.) Yellow condition signs.	Short-term Short– to mid-term	$8,200 $0 (to be completed by pathway maintenance crews)
Pathways in off-leash dog areas	53.29km (106.58m of fence)	Install four-foot chain link fence to separate pathway from off-leash dog areas.	Short– to long-term	$3,730,300
Pathways adjacent to off-leash dog areas	8.38km	Install four-foot chain link fence to separate pathway from off-leash dog areas.	Short- to long-term	$293,300
TOTAL				**$8,017,075**

3. Planning and design

The current "Development Guidelines and Standard Specifications for Landscape Construction" relate to agreed upon best processes with the Urban Development Institute. All the content details relate to planning and design that enhances asset quality and public safety in the development of parks and pathways. These guidelines and specifications have existed since 1994, with some adjustments each year.

The field audit details as indicated in Table 20 reflected on infrastructure that had been built since 1974. The recommendations, implementation plans and budget necessary to remedy the existing pathway infrastructure is detailed in the previous section.

In this section, we want to recommend changes to the pathway development guidelines that would enhance public safety. The recommendations are:

- Increase minimum width on local pathways to 2.5 m from 2.0 m.

  Rationale: On local pathways within communities, there is a higher percentage of elderly people, people in wheelchairs, and mothers with baby strollers, etc. In addition, many of our local pathways in parks are busy with citizens accessing playgrounds and sport fields.

- Enhance consistency on planning, design approval and inspections in regards to the 1 m safety clearance and setback requirements. In the few cases where this can't be achieved, review the hazard and determine possible mitigation measures.
- Develop design options for twinning pathways (to separate "wheels" from "heels").

For the upgrading or life cycling of existing pathways, the recommendations in Section III, 2 apply. In addition, however, the following recommendation are made when pathways are to be life cycled or upgraded.

- Increase width of Regional pathways in river and creek valleys to 4 m wherever possible.
- Increase width of Regional pathways in the uplands to 3 m wherever possible.
- Increase widths of Local pathways to 2.5 m wherever possible.
- In some areas, consider twinning as an alternative to increasing widths.

New planning recommendations include:

- Create a lighting policy for pathways
- Investigate feasibility of allowing electric bikes and Segways on pathways.

4. Maintenance

For the most part, maintenance of the pathway system is good. As outlined earlier in th e report, the major public concerns are: snow and ice removal; debris on the pathway; and cracks/potholes/root damage on the pathway. Parks staff respond to these service requests in the short term.

The majority of public service requests on pathways deal with snow and ice removal (35 – 50% annual requests), and the majority of these deal with requests to clear more of the pathway system.

It is recommended that more pathways are approved for snow clearing. This would enhance winter use and move Calgary more in line with other winter cities. The other cities surveyed as part of this safety review clear between 45 and 100 per cent of their systems.

Calgary currently clears 157 km or 22 per cent of the pathway system. It is recommended that the number of kilometres cleared be increased to 300 (42% of current system). The additional annual budget is estimated at $500,000.

5. Education/enforcement

This is a critical area in regards to pathway safety. Both the public and stakeholder groups have identified the "actions/behaviours of users" to be the number one safety issue on the multi-use pathway system. As well, all parties identified increased enforcement and education as areas where actions need to be taken to improve safety.

Therefore, it is recommended that:

- A joint education plan for multi-use pathways be developed and implemented by Transportation, Parks, and Animal and Bylaw Services (ABS).
- A joint Parks and ABS workplan be developed to increase bylaw officer presence and targeted enforcement on the pathways.

Section IV – BIBLIOGRAPHY

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Section V – APPENDIX

1. Survey of other cities

Edmonton, Alberta, Canada

Ottawa, Ontario, Canada

Denver, Colorado, USA

Minneapolis, Minnesota, USA

Portland, Oregon, USA

Seattle, Washington, USA

A. INFRASTRUCTURE/ENVIRONMENTAL DETAILS				
City	**Population**	**Pathway/ trail length**	**System description**	**Material composition**
Calgary, Alberta, Canada	1,071,515 (2010 Civic Census)	over 700 km (445 miles) approximately	Network of regional and local pathways	Primarily asphalt, some concrete and pavers
Edmonton, Alberta, Canada	782,439 In 2009	+/-165 km (103 miles)	Network	52% asphalt 48% granular
Ottawa, Ontario, Canada	900,000 1.2 million in Canada's Capital Region	350 km (217 miles)	Network of bi-directional largely interconnected with on-road linkage	Paved asphalt pathways, hard packed stone trails
Denver, Colorado, USA	2,700,000 Metro Denver area	105 km (65 miles)	Network of pathways that extend past Denver's city limits	80% concrete 20% asphalt
Minneapolis, Minnesota, USA	390,131	129 km (80 miles)	Spiderweb network	Primarily asphalt
Portland, Oregon, USA	582,130 In 2009	240 km (151 miles)	Network of pathways – regional pathways connecting destinations	Generally constructed of asphalt and concrete
Seattle, Washington, USA	630,320	74 km (46 miles)	Twinned	Asphalt

A. INFRASTRUCTURE/ENVIRONMENTAL DETAILS				
City	**Adjacent land use**	**Defined topography features**	**Associated structures**	**Guidelines and specifications**
Calgary, Alberta, Canada	Developed parks, road right-of-ways, environmental open space	Hilly in the west and river valleys, flat on east side	Numerous bridges, shared road overpasses, underpasses and tunnels	Development Guidelines and Standard Specifications – Landscape Construction
Edmonton, Alberta, Canada	Developed parks, natural areas, road right-of-ways	Flat except in river valley where steep grades exist	Numerous bridges and overpasses, very few underpasses and culverts	Yes
Ottawa, Ontario, Canada	Along roadways, through parks and in rural and urban areas	Not many significant slopes, grade is limited to 5%	Pedestrian bridges, shared road overpasses, underpasses and tunnels	Yes NCC's Pathway Network for Canada's Capital Region 2006 Strategic Plan
Denver, Colorado, USA	Waterways (rivers, creeks, canals, gulches) through parks and natural areas	Topography is mostly flat, easily negotiated	Pedestrian bridges, shared road overpasses, underpasses and tunnels	Yes Specific criteria and details for construction
Minneapolis, Minnesota, USA	Developed parks, natural areas, road right-of-ways	Flat	Several bike/ pedestrian bridges	Yes Minneapolis bicycle design Guidelines
Portland, Oregon, USA	Developed parks, natural areas, road right-of-ways	Eastern portion flat, western portion is hilly	Several bridges and culverts as part of pathway system, pedestrian overpasses and underpasses in right-of-ways	Yes
Seattle, Washington, USA	Developed parks, natural areas, road right-of-ways	Flat along waterfront, hilly under power lines	Bridges and pedestrian overpasses	Yes – Standard Specifications for Road, Bridge and Municipal construction as well as recommendations from AASTO bike guide.

B. USERS				
City	Type of users allowed	Typical number of users	Predominant type of users	Seasonal changes in type of users
Calgary, Alberta, Canada	Non-motorized, walking, biking, in-line skating, dog walking	89% of residents use the pathway system annually; 45% weekly; busiest site is 7,524 users/day(627/hr over 12-hour period 7 a.m. –7 p.m.)	Walkers, cyclists, joggers, in-line skaters, dog walkers; major reason for pathway use is recreation and exercise (87%); commuting (13%)	Peak users June to August; shoulder season April/May/ September/October; lowest use from November to March
Edmonton, Alberta, Canada	Pedestrians, joggers, biking, roller blading, dog walkers	The number of trips by walking or cycling was up 16% from 1994 to 2005, with a greater increase in the 25 to 64 age category. In 2010 an average of 65 trips per hour was recorded at 8 different locations throughout the pathway system.	Dependant on location, used by both pedestrians and cyclists	Usage highest in summer/fall, lowest in winter.
Ottawa, Ontario, Canada	Non-motorized, walking, biking, in-line skating, dog walking	60% of residents use pathway annually	On average, more than 80% of pathway usage is recreational in nature	Summer highest use at 4 x per week, 1.2 x per week in winter
Denver, Colorado, USA	Motorized vehicles and equestrians prohibited	Counts can exceed 500 per hour in optimum conditions	Recreational bikers and joggers	Higher temperatures bring higher user counts, commuters ride in any weather
Minneapolis, Minnesota, USA	All types of users	500 to 3,000	Residents, visitors and commuters	About 25% bike year-round
Portland, Oregon, USA	Bicyclists, pedestrians, equestrians, jogging/ running, in-line skating, hiking, dog walking	77% of residents use each year; 50% at least monthly	Walkers and bikers	Trail usage highest in warmer summer, lowest in rainy, winter months
Seattle, Washington, USA	Bicycles, pedestrians and other non-motorised users	Busiest trail 300 users in 2-hour period	Bicycles and pedestrians	Numbers increase with recreational users in summer and mostly bike commuters in winter

B. USERS				
City	Daily changes in type and number of users?	Dealing with segways and electric bikes?	Are dogs allowed on pathway system?	Do you have conditions for dogs on pathways?
Calgary, Alberta, Canada	Weekdays – highest numbers during commuter hours and lunchtime: Weekends -peak numbers mid-morning to supper time.	Non-motorized only; no gas or electric bikes scooters, Segways, skateboards	Yes	On leash on pathways, dog must be on short leash <2m; cyclists and in-line skaters not permitted to have dog on leash
Edmonton, Alberta, Canada	No daily change in type	Segways not allowed, electric bikes are allowed on all pathways	Yes	On leash unless a specified off-leash area
Ottawa, Ontario, Canada	All use for recreation, 47% use for commuting	Under review at this time	Yes	On leash and waste must be picked up
Denver, Colorado, USA	Higher usage during commuter times and lunch hours	They have not been an issue to date	Yes	They must be leashed and picked up after
Minneapolis, Minnesota, USA	Varies more by weather	Segways and electric bikes are allowed	Yes	City and Park ordinances apply
Portland, Oregon, USA	Tends to be highest during peak commuter hours, then heavy use on weekends	Electric assist bicycles and Segways are permitted on pathways	Yes allowed on pathways, but are restricted from some natural areas to protect wildlife	On leash, in permitted areas, no aggressive dogs, and pick up dog waste
Seattle, Washington, USA	We do not have this data	Electric assisted bikes are allowed	Yes	Must be on leash

B. USERS		
City	**Does your city have off-leash dog areas? (OLDA)**	**Does your city have pathways that go through OLDA?**
Calgary, Alberta, Canada	Yes	Yes, The City of Calgary has approximately 53 km of pathway through off-leash areas as well as 8.4 km of pathway adjacent to OLDAs. The City of Calgary OLDA guidelines states that regional pathways that go through OLDAs must be separated by a fence, to reduce conflicts.
Edmonton, Alberta, Canada	Yes	Yes
Ottawa, Ontario, Canada	Several, some are inner urban and are typically enclosed smaller areas, the others are suburban and are significantly larger some of which are enclosed, others not	Yes
Denver, Colorado, USA	A total of six off-leash parks	Not directly through off-leash, but are in close proximity to some.
Minneapolis, Minnesota, USA	Yes	Not through but nearby
Portland, Oregon, USA	Yes have several in our park system	Have trail systems within our developed parks that lead to the off-leash dog areas, though none of our regional trail system lead through them.
Seattle Washington USA	Yes	The trail systems go near off-leash areas

C. BYLAWS/LAWS/RULES				
City	**What are your bylaws? Can we get a copy?**	**Are your bylaws enforced? If so by who?**	**Does your city have an education strategy?**	**Does your city have speed limits on pathways?**
Calgary, Alberta, Canada	Bylaw 20M2003 "Parks and Pathway Bylaw"	The City works within an education first framework then moves to enforcement.	CAN-BIKE education courses, Calgary.ca website, and paper maps have rules regarding off-street share the pathways; Animal and Bylaw Services has a variety of programs.	Yes, 20 km unless posted. In addition, must "travel under control at a reasonable rate of speed with regard to the nature, condition and use of the path including the amount of pedestrian traffic."
Edmonton, Alberta, Canada	Traffic Bylaw 5590 and Parkland Bylaw 2202 http://www.edmonton.ca/bylaws_licences/bylaws/bylaws-by-number.aspx	Yes, by City Police and Peace Officers. Park Rangers also enforce on parkland.	Yes, done through education and outreach, Edmonton has websites, ad campaigns, informative videos, and outreach at various community and institutional events.	No, must "travel under control, a reasonable rate of speed with regard to the nature, condition and use of the path including the amount of pedestrian traffic."
Ottawa, Ontario, Canada	Yes, Parks and Facilities Bylaw http://ottawa.ca/residents/bylaw/index_en.html	City bylaw officers, NCC conservation officers supervise the NCC pathways.	CAN-BIKE education courses are offered, Traffic Safety outreach campaigns, Share-the-Road and the Integrated Road Safety Campaign.	Yes, 20 km/h.
Denver Colorado USA	City and County of Denver's Revised Municipal Code**view at denvergov.org	Enforced by the Denver Police Department.	No reply.	Not to exceed 20 mph.
Minneapolis, Minnesota, USA	http://www.ci.minneapolis.mn.us/government/laws.asp	Minneapolis Park Police and Minneapolis Police Department.	Yes, they can be found in the draft Bicycle Master Plan.	Yes 10 mph.
Portland Oregon USA	www.portlandonline.com/parks/index.cfm?c=42336&a=161457	Park rangers and staff can enforce trail etiquette. Police enforce illegal activities.	Our brochure and signage are used to educate trail users on trail etiquette.	No, though users are asked to use safe speeds at all times.
Seattle, Washington, USA	Seattle Traffic Code Section 11.40-11.58	Yes, online.	Seattle Police Department.	No.

	D. MANAGEMENT	E. MAINTENANCE	
City	What buisness unit or department manages pathways?	Do you preform formal inspections on paths?	Do you have an annual maintenance budget on paths?
Calgary, Alberta, Canada	Parks.	Annual pathway inspections of entire system; every three years inspect and report on condition of bollards and signs.	Yes,approximately $2 million. Year-round maintenance including snow and ice control.
Edmonton, Alberta, Canada	The paths on road right-of-way are managed by our Transportation Department and those on parkland are managed by Community Services (Parks).	Yes, but only those that are in road right-of-way or on a Public Utility Lot.	Pathway budget unknown. Budget is not specific to pathways/trails, but it is part of the sidewalk maintenance activity.
Ottawa, Ontario, Canada	Transportation Planning Branch planning for new pathway, Infrastructure Services Department for construction and life cycle maintenance, Public Works Department for day-to-day operation and maintenance of pathways network.	Yes, as part of our asset life cycle renewal processes.	Yes, amounts are unknown. Pathway winter maintenance is included in the City's sidewalk maintenance programs. We have no information related to NCC snow clearing budgets and operations.
Denver, Colorado, USA	Denver Parks and Recreation and the Department of Public Works (ON-STREET).	Inspections are preformed not less than twice monthly.	Yes, amounts unknown. Part of which is tied into our capital improvement(s) budget.
Minneapolis, Minnesota, USA	Public Works and the Minneapolis Park and Recreation Board maintain trails.	Yes, inspections of all city assets including pathways are needed on a regular basis.	Yes, details are unknown.
Portland, Oregon, USA	Planning team has planner assigned a specific area of city.	Yes – as part of our Asset Management program we do assess our circulatory system, which includes pathways/trails.	Yes, amounts unknown. Funds budgeted are not separated, part of general maintenance funds for the Service Zone or City Nature group responsible for maintaining the trail.
Seattle, Washington, USA	Seattle Department of Transportation, Traffic Management Division.	Yes.	Yes, no details provided.

E. MAINTENANCE		
City	**Does your city do snow and ice control on your pathways? On how many kilometers (miles)**	**How much money do you spend on snow and ice control?**
Calgary, Alberta, Canada	Yes, we have both priority 1 (within 24 hours), and priority 2 (within 72 hours), and clear a total of 157 km. This is 22% of the system.	The pathway snow and ice budget is $550,000. Yearly expenditures vary based on the amount of snowfall.
Edmonton, Alberta, Canada	Yes, 75 km of which Parks clears 45 km of hard surfaced paths in the river valley and connecting ravines. This is 45% of the system.	Unknown, funds are not separated from sidewalks on road right-of-way.
Ottawa, Ontario, Canada	Winter maintenance is performed on an estimated 190 km (a combination of City and CCP pathways). This is 54% of the system.	Unknown, this cost is assumed within the sidewalk maintenance program, there is no specified data on the cost per facility type.
Denver, Colorado, USA	Yes all of our 65 miles of pathways receive snow and ice control on. This is 100% of the system.	Annual costs vary from year to year depending on weather patterns.
Minneapolis, Minnesota, USA	The Minneapolis Park and Recreation Board (MPRB) maintains about 70 miles, Public Works about 10 miles. This is 100% of the system.	Approximately $50,000. The MPRB spends considerably more.
Portland, Oregon, USA	No – no treatments in advance of events, though we do clear debris/snow after it occurs.	Not applicable (for PP&R trails)
Seattle, Washington, USA	No	n/a

F. LIFE CYCLE REPLACEMENT			
City	**Forecast life cycle replacement of pathways?**	**Who within your organisation will forecast life cycle?**	**Annual life cycle replacement budget?**
Calgary, Alberta, Canada	Forecast a 15-year life cycle but annual inspections and safety adjust forecasts.	Pathway coordinator.	Average is $1million annually.
Edmonton, Alberta, Canada	The forecast is tied to the average life of our sidewalk system.	Pavement management engineer.	No.
Ottawa, Ontario, Canada	Pathways are forecasted for a 30-year life cycle.	The Asset Management Branch of the Infrastructure Services Department is responsible for the life cycle assessment processes.	Annual budget for sidewalk rehabilitation, Curb and Sidewalk Reconstruction Program, including pathways, pathways within parks included in annual budgets for rehabilitation work that is planned for parks.
Denver, Colorado, USA	Yes. 25 years for a concrete surface and 10 to 15 years for asphalt surface.	Operations supervisor along with planning, design and construction division.	Not specifically.
Minneapolis, Minnesota, USA	Yes.	A senior technician.	Trails are new, won't require programming for several years, MPRB has improved 90% of original trail system.
Portland, Oregon, USA	No. PP&R does not provide life cycle replacement forecasts for our paths and trails.	Not applicable.	No – we budget upcoming capital improvement projects as necessary in our Capital Improvement Project forecasts.
Seattle, Washington, USA	No, but would love to see the methodology and how it is done.	n/a	n/a

F. Life Cycle Replacement			
City	**Life cycle replacement budget for pathways?**	**Does your city do inspections of work performed on pathways?**	**Who performs the inspections on your pathways?**
Calgary, Alberta, Canada			New pathways – Parks staff; existing pathways- entire system done annually by Parks staff.
Edmonton, Alberta, Canada	Most of the shared-use pathway inventory is relatively new, our current expenditures are close to negligible.	Capital work is inspected, maintenance under the supervision of district foremen.	Our development engineering section within Transportation will inspect trails on road right-of-way and parks would inspect their own. All inspections would be done by City personnel.
Ottawa, Ontario, Canada	Curb and Sidewalk Reconstruction Program is $500,000/year, a few million dollars for sidewalks and pathways each year within the Integrated Road Reconstruction Program.	Yes	Staffs from the Asset Management Branch and from Construction Services Branch perform the inspections.
Denver, Colorado, USA	Figure depends upon approval of CIP requests.	Yes	Parks and Recreation staff routinely conduct inspections with assistance from public works.
Minneapolis, Minnesota, USA	Currently have money in the 5- year budget for preventative maintenance, $100,000 per year	Yes	Sometimes city workers. In some cases it's a consultant.
Portland, Oregon, USA	PP&R believes we should be targeting $10K/mile for trail maintenance.	Yes	Park maintenance supervisor, on soft surface; heavy equipment lead if paved path with minor work performed. Larger work: engineer or project manger would be involved. If Capital Improvement Project, inspector would be project manager or construction managers from the Capital Construction team.
Seattle, Washington, USA	n/a	Yes	Urban Trails and Bikeway co-ordinator

G. SAFETY CONCERNS/ISSUES			
City	**Major concerns regarding safety on your pathways?**	**Does your city record accidents on pathways?**	**What number of accidents per year on your pathways?**
Calgary, Alberta, Canada	Conflicts and collisions among users; planning and design in select areas; condition of asset in some areas; snow and ice concerns.	Yes, only claims involving injury or property damage. Some units (e.g. Police) have scattered records depending on the detail taken by staff.	21 accident claims in past six years (average 3.5/year)
Edmonton, Alberta, Canada	Snow and ice control. Integrating parkland trails with road right-of-way trails.	Road right-of-way trails – no unless a motor vehicle is involved. Parks – Park Rangers keep a log of accidents.	Unknown
Ottawa, Ontario, Canada	The presence of hidden or secluded areas (28%), insufficient lighting (22%) and speeding by cyclists (16%) are also mentioned reasons for dissatisfaction	There is no centralized recording process for other accidents reported by citizens.	Details of other accidents are unknown, not widely reported by users.
Denver, Colorado, USA	Excessive speeds and user conflicts	Only claims involving injury or property damage, most go unreported.	Unknown
Minneapolis, Minnesota, USA	At grade trail crossings at four-lane roadways	Yes, if it is severe enough to generate a 911 call and a police report.	Only a handful, 95% of the cities 275-300 bicycle crashes per year happen on-street
Portland, Oregon, USA	Conflicts and collisions between users, and keeping trails and pathways in an acceptable condition.	No mechanism in place to track, due to medical confidentiality.	Have numbers for general liability claims filed against PP&R for injuries the city should pay for, in the State of Oregon, able to hinge our defence on recreational immunity – free and open to the public – allows us additional leveraging on our defence.
Seattle, Washington, USA	Railroad and roadway crossings. Getting users to obey rules, speeding, audible or bell when passing, keeping to right.	Yes, as long as they are reported to Seattle Police or Fire Department.	Have collision data for specific locations, do not collect the total amount of accidents that happen on all trails per year.

G. SAFETY CONCERNS/ISSUES		
City	**Is there data available regarding accidents per year on your pathways?**	**How does your city address safety on pathways?**
Calgary, Alberta, Canada	Yes, tracked through Police, Fire and Bylaw. Animal and Bylaw Services.	Planning and Design Guidelines; formal annual safety inspections of surface; addressing deficiencies from 3-1-1 in a timely manner; annual pathway lifecycle replacement program; regulation and warning signage program; annual maintenance plans; education and enforcement efforts by Animal and Bylaw Services and Parks staff; educational initiatives; website information.
Edmonton, Alberta, Canada	No.	Education and enforcement.
Ottawa, Ontario, Canada	All situations where Pathway Patrol have had involvement are reported and recorded. Details of other accidents are unknown, not widely reported by users.	Bylaw officers patrol the pathways on foot and bicycle NCC conservation officers supervise the NCC pathways. Parks, Recreation and Culture work with volunteer community groups to organize volunteer pathway patrols. The Ottawa Police Services and the RCMP are available to respond to urgent situations on the pathway network. Pathway Patrol, as all PRCS staff trained in Standard First Aid with CPR. Accessibility Awareness Training- Parks and Recreation Integrated Customer Service Module, Occupational Health and Safety Training including needle and crack pipe disposal procedures, WHMIS.
Denver, Colorado, USA	Not to respondent's knowledge.	Safety is the key element in maintenance and design. Public safety is upheld by conducting thorough trail inspections and by implementing a comprehensive signage program.
Minneapolis, Minnesota, USA	Yes, police reports.	Targeted enforcement, educational initiatives including Safe Routes to School, promoting safety through the bicycle ambassadors, and through public service brochures.
Portland, Oregon, USA	No.	Developed etiquette brochure, use education, enforcement to encourage appropriate behaviour on our trails and pathways. During design, and specified in our Trail Design Guidelines, we look to separate modes of travel. To sum: First choice – separate trail from vehicles, Second choice – Minimize vehicle crossings of trail, Third choice – If trail co-exists with road, then choose route with lower speed and volume, design for visibility and crime prevention in all settings.
Seattle, Washington, USA	No answer.	We are working to improve our trail crossings with added signage, re-aligning crossings and adding more advisory and regulatory signs.

CONTACT INFORMATION AND ATTACHMENTS	
City	
Calgary, Alberta, Canada	http://www.calgary.ca/parks
Edmonton, Alberta, Canada	http://www.edmonton.ca/transportation/roads_traffic/travel-pattern-analysis.aspx
Ottawa, Ontario, Canada	http://ottawa.ca/residents/bylaw/index_en.html
Denver, Colorado, USA	**view at denvergov.org
Minneapolis, Minnesota, USA	http://www.ci.minneapolis.mn.us/bicycles/bicycle-plans.asp http://www.ci.minneapolis.mn.us/bicycles/BicycleTrafficMap2009.pdf http://www.ci.minneapolis.mn.us/bicycles/MidtownCount2009.pdf http://www.ci.minneapolis.mn.us/government/laws.asp
Portland, Oregon, USA	http://www.portlandonline.com/parks/index.cfm?c=42627&a=120478 http://www.portlandonline.com/parks/index.cfm?a=250105&c=38306 http://www.portlandonline.com/shared/cfm/image.cfm?id=206901 http://www.portlandonline.com/parks/index.cfm?c=42336&a=161457
Seattle, Washington, USA