October 12, 2004
File No. 5400

To: Members,
Works and Utilities Committee

Re: Roadways Operations
Inspection Policy and Maintenance Policy — Concrete

BACKGROUND

The City of Regina is responsible for approximately 1270 kilometres of sidewalk, 550 kilometres of separate curb and scores of medians and islands. The total replacement cost of these public works is in the order of $350 million. As these concrete works age, they deteriorate. In 1999 and 2000, the administration did a comprehensive survey of the City's sidewalks to determine the extent of their deterioration. This survey, along with updates made to its results in 2004, revealed 52,000 sidewalk distresses. If lower-cost maintenance methods were used, the estimated cost to maintain these distresses would be $12 to $15 million.

The problem of deteriorating concrete works in the City is also faced by many other cities in North America. An infrastructure deficit occurs when maintenance requirements exceed available funding. The City's concrete infrastructure deficit is considerable. The estimated cost of the City's required concrete maintenance is 6 times greater than current funding levels for maintaining sidewalks, curbs, medians, paving stones and other similar works.

This report requests the Committee's recommendation that Council adopt an Inspection Policy and a Maintenance Policy to manage the concrete public works for which the Engineering and Works Department is responsible.

DISCUSSION

The Roadways and Traffic Division of Engineering and Works has begun to formally establish and document the programs and activities in each of it's major program areas. The adoption of formal policies and procedures is key to strategically and objectively addressing the City of Regina's infrastructure deficit. The Inspection Policy - Concrete and the Maintenance Policy – Concrete is the first product of the Roadways and Traffic Division's initiative.

Beyond providing a valuable operational and budgeting tool, the adoption of formal public works inspection and maintenance policies is important to the City's risk management activities.

Section 306 of *The Cities Act* requires cities to maintain public highways, including streets, lanes and sidewalks, in a reasonable state of repair. The City of Regina has delivered a program of concrete maintenance for many years, which is subject to Council's scrutiny during the annual budget approval process. However, when assessing a municipality's liability for injuries or damage, the courts draw a distinction between the "policy" and "operational" decisions made by municipalities. The courts give deference to policy decisions, but not to operational decisions. Practically, this can mean the difference between the City being found legally responsible for accidents related to the state of repair of these works, or not.

Council's approval of these policies for the inspection and maintenance of these public works is important to ensure that they are recognised as policy decisions.

The Engineering and Works Department and the City Solicitor's Office, with help from the other City departments, have collaborated to present the following concrete inspection and maintenance policies.

Roadways Operations Inspection Policy — Concrete (Appendix A)

The Roadways Operations Inspection Policy — Concrete outlines: (a) the classification of the works that will be inspected; (b) the frequency of the inspections; (c) general details about the types of distresses that will be measured; (d) the manner in which the collected information will be used; and (e) the priority of distresses and streets.

The Inspection Policy is intended to satisfy the City's statutory obligations and to provide a formal inspection standard to reduce the City's exposure to liability. Collecting information about the condition of these public works is fundamental to the City's infrastructure management plan. InfraGuide and other organisations that deal with municipal infrastructure consider it a best practice.

The inspections will measure and quantify the number, types, locations and magnitude of the concrete distresses with which the City is faced. This information will be used to develop annual maintenance programs that will address these distresses in a strategic manner. Regular and systematic inspections will provide the data necessary to begin tracking trends, which in turn will aid the City in making investment choices and any required adjustments to the concrete maintenance program over time.

The Inspection Policy considers that the City's various concrete works in certain locations are used more than in other locations. To address this issue, the Inspection Policy classifies concrete walks and walks surfaced with paving stones into two groupings. The Administration used a combination of zoning and street priority to distinguish the sidewalks with potentially higher user volumes (Group A) from those considered as normal user volume (Group B). The Administration considered doing pedestrian counts to determine the groupings, but the high cost and lack of any standardized methods ruled it out as a practical approach.

Similarly, curbs, gutters, medians and islands are grouped based the City's street priority system, which reflects the differences in vehicular traffic volumes.

Roadways Operations Maintenance Policy— Concrete (Appendix B)

The estimated cost of the repairs that the City needs to make to its concrete works greatly exceeds the City's ability to fund the needed repairs. Based on current expenditure levels, it will take a cycle of 250 years to replace all the concrete works in the city.

While the Capital Budget for street improvements often includes expenditures for concrete replacement, these replacements are determined by assessing the characteristics of the required street repairs or replacements. If it is technically necessary or, in some cases, most cost-effective to replace concrete works in conjunction with a street enhancement or repair project, then the funds are allocated from the Capital Budget.

The Maintenance Policy for Concrete only allocates the funds available from the Operating Budget. The 2004 Operating Budget Allocation for concrete maintenance is $518,200.

The Maintenance Policy outlines the methodology that the administration will use to select locations to maintain. It establishes a specific level of service for the City's concrete works and allocates maintenance funding to the various classes of concrete works and types of distresses.

In order to spend the City's concrete budget strategically, distresses will be repaired on a descending order of magnitude basis, having been prioritised according to the principles of the Inspection Policy. The prioritisation is generally as follows:

HIGHEST PRIORITY	**1**	Higher pedestrian volume sidewalks
	2	Normal pedestrian volume sidewalks
	3	Higher vehicular volume curbs, gutters, medians, islands, etc.
	4	Normal vehicular volume curbs, gutters, medians, islands, etc.
LOWEST PRIORITY	**5**	Requests for service or concerns that do not fit in the first four classes

Additionally, the administration has used the relative replacement value of each class of concrete (sidewalk, curb, medians, etc.) to guide the amount of maintenance funding allocated to those classes.

The proposed allocation of maintenance funding for 2005 is presented in Appendix C. The Administration will evaluate the impact of the allocation strategy using the data gathered under the Inspection Policy. The funding allocation percentages will remain the same for a minimum three year period. This should allow sufficient time for the particular allocation strategy to affect the inventory to a measurable degree. However, for critical unanticipated distresses, it may not be appropriate to leave reallocation until the end of a given three-year period. To deal with these contingencies, the Director of Engineering and Works will make discretionary interim adjustments to the allocations as are warranted by each situation that arises.

The Maintenance Policy - Concrete also provides a principled approach to the selection of the maintenance methods that will be used on each repair. Lower-cost repair methods will be used if they are technically suited to the specific problem being addressed. For example, replacing concrete is approximately five times more expensive than other lower-cost methods, such as asphalt capping. With two exceptions replacing concrete at a location will only be considered when all the lower-cost methods are not technically feasible. This approach will ensure that the greatest numbers of distresses are repaired in the most efficient manner.

BUDGET IMPLICATIONS

There are no direct budget implications related to this report. Currently, the cost of inspections and maintenance are borne by the Operating and Capital budgets of the Engineering and Works Department. This will remain the same. The allocations made under the Maintenance Policy simply earmark whatever funds are available in the Operating Budget for concrete maintenance.

With limited resources and fiscal restraints, City Council balances the innumerable competing priorities and decides what portion of the Operating Budget will be allocated for concrete maintenance each year. If Council decides that the funding for concrete maintenance is not appropriate, then they may address the issue in the Operating Budget process.

COMMUNICATION PLAN

A communication plan will be developed and implemented in consultation with Public Affairs.

ENVIRONMENTAL IMPLICATIONS

None with respect to this report.

DELEGATED AUTHORITY

City Council is required to ratify the recommendations in this report.

CONCLUSION

The City of Regina has a statutory duty to maintain public sidewalks and other works in a reasonable state of repair. The administration is seeking City Council's approval for a policy on the inspection and maintenance of the concrete sidewalks, paving stones, curbs, medians and islands in the City. The Roadways Operations Inspection Policy - Concrete and Maintenance Policy - Concrete satisfy the City's obligations under *The Cities Act* and serve to protect the City from liability. These policies also support the objectives of the Roadways and Traffic Division by strategically and objectively addressing the City's infrastructure deficit.

Adoption of the policies will not alter the current level of funding for concrete maintenance. If City Council wants to adjust the Levels of Service for concrete maintenance, the adjustment may be made during the Operating Budget process.

RECOMMENDATION

Your administration recommends that the City Council formally adopt the following:

(a) Roadways Operations Inspection Policy — Concrete

(b) Roadways Operations Maintenance Policy — Concrete

(c) Proposed Budget Percentage Allocation

Respectfully submitted,

W. Dorian Wandzura, General Manager
Roadways & Traffic Division

Respectfully submitted,

D. Calam, Director
Engineering and Works Department

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APPENDIX A

ROADWAYS OPERATIONS
Inspection Policy —Concrete

Purpose

This policy:

(a) Provides written inspection and maintenance standards to:

  (i) Satisfy the City's statutory obligations;

  (ii) Protect the City from liability; and

  (iii) Increase the confidence of the City's insurer.

(b) Provides the basis for obtaining appropriate data on specific locations and conditions;

(c) Aids in the development of the annual concrete maintenance program;

(d) Creates a basis for analysing the City's network of concrete works; and

(e) Complements the Roadways Operations Maintenance Policy — Concrete.

Definition

Concrete Distress Types

Broken means a panel has two or more full-depth cracks and is broken into three or more pieces;

Cross Slope means heaving or settlement that has caused the cross slope of the concrete to vary from the normal design standard, whether to the street-side or to the back of the walk-side;

Differential Settlement means the vertical shift of two adjacent parts or panels that causes a difference in the elevation of the parts or panels;

Longitudinal Cracking means a full depth crack running roughly parallel to the direction of a walk or curb;

Spalling means the deterioration or 'scaling off' of the normally smooth finish of concrete.

Transverse Cracking means a full-depth crack running roughly perpendicular to the direction of a walk or curb;

Water Ponding means the settlement or heaving of concrete that results in poor drainage or the ponding of water on the surface of the concrete.

Curb-face height
Curb-face height means the distance from the top of a curb to the adjacent asphalt street surface.

Director
Director means the Director of Engineering and Works and anyone designated by the Director.

Documented Notification
Documented Notification means written correspondence to the City of Regina or a request for service made via the City's Call Management System.

Flatwork
Flatwork means the concrete, interlocking paving stones or asphalt surfacing located on the inside of median and traffic island curbs.

Group A Sidewalks
Group A Sidewalks (whether concrete and/or paving stones) are sidewalks that are:

(a) adjacent to the following zone designations from *The Regina Zoning Bylaw*, No. 9250:

  (i) Residential — R6, R4A, C and TAR;

  (ii) Commercial — LC3, DSC, MAC, D, MS and MAC3; and

  (iii) Institutional — Hospitals, Public and Separate Schools

(b) adjacent to church or synagogue properties irrespective of zone designation

(c) adjacent to senior housing complex properties that have twenty or more living units irrespective of zone designation

(d) at selected locations on Street Priority 1 or 2 streets that connect larger concentrations of the zones identified in subsection (a);

(e) located in easements which are within three hundred lineal meters of any other Group A sidewalk.

Group B Sidewalks
Group B Sidewalks are all other sidewalks in the City that are not Group A Sidewalks.

Street Priority
Street Priority means the classification of a block based on the street prioritisation system in the City's Winter Road Maintenance Program.

Scope

This policy addresses the concrete public works for which the Engineering and Works Department is responsible, including:

(a) Sidewalks;

(b) Pedestrian ramps;

(c) On-street crosswalk areas (usually asphalt street surface) between Groups A Sidewalks;

(d) Interlocking paving stones installed by the City that are between the back of the street curb and the property line dividing public and private property;

(e) Curbs and gutters, both separate and attached;

(f) Medians and islands (including curb, gutter, and Flatwork).

Concrete works that are *not* addressed in this policy are:

(a) Walks, driveways, interlocking paving stones and other concrete works that are used as accesses to private property or that have been installed by or for a private property owner;

(b) Concrete works that are located in the F.W. Hill Mall, in City parks and open spaces, adjacent to City facilities or on the property controlled by the Wascana Centre Authority;

(c) Concrete walks, curbs, etc. that form parts of bridges or other structures.

Authority

This policy is established by City Council.

Contact

For further information, please contact:

Engineering and Works Department
Roadways & Traffic Division
P.O. Box 1790
2425 4th Avenue
Regina, Saskatchewan S4P 3C8

Tel: 306.777.7901

Fax: 306.777.6801

Policy Statement

A. Classifications, Groups, Street Priorities and Distress Types

Classifications

Each concrete distress and service request location will be linked to the block on which the distress is located and assigned to one of the five following classes:

(a) **Sidewalks** including pedestrian ramps and the on-street crosswalks between Group A Sidewalks;

(b) **Interlocking Paving Stone** installed by the City that are between the back of the street curb and the property line dividing public and private property;

(c) **Curbs and gutters** both separate and attached;

(d) **Medians and islands** (including curb, gutter, and Flatwork); and

(e) **Miscellaneous**; locations, distresses, and related requests for service that do not fall within one of the other four classifications.

Sidewalk and Interlocking Paving Stone Classifications - Groupings and Distress Types

Each concrete distress or service request location within the Sidewalk and Interlocking Paving Stone Classifications with be assigned to one of two inspection groups, A or B (See **B. Inspection** below).

Sidewalk Distress Types

Each Group (A and B) in the Sidewalk Classification will be further labelled with one of the seven following distress types:

(a) Broken

(b) Cross Slope

(c) Differential Settlement

(d) Longitudinal Cracking

(e) Spalling

(f) Transverse Cracking

(g) Water Ponding

Interlocking Paving Stone Distress Types

Each Group (A and B) in the Interlocking Paving Stone Classification will be further labelled with one of the three following distress types:

(a) Differential Settlement and Broken

(b) Spalling

(c) Cross Slope and Water Ponding

Curb and Gutter, and Median and Islands Classifications - Street Priorities and Distress Types

Each concrete distress or service request location within the Curb and Gutter, and Median and Islands Classifications will be assigned to one of two Street Priorities, either *Street Priority 1, 2 & 3*, or *Street Priority 4*.

Curb and Gutter Distress Types

Each Street Priority in the Curb and Gutter Classification will be further labelled with one of the four following distress types:

(a) Differential Settlement and Transverse Cracking

(b) Spalling and Broken

(c) Cross Slope

(d) Water Ponding (including catch basin adjustments)

Medians and Islands Distress Types

Each Street Priority in the Median and Island Classification will be further labelled with one of the three following distress types:

(a) Curb - Spalling, missing, Broken

(b) Curb - Face height

(c) Flatwork (only missing pieces will be inspected or maintained)

Miscellaneous Classification –Types

Each concrete distress or service request location within the Miscellaneous Classification with be assigned to one of the six following types:

(a) New Pedestrian Ramp Installations

(b) Private Driveway Crossings

(c) Private Walk Interface (trip hazards, Water Ponding, etc.)

(d) Special Needs

(e) Cost Sharing

(f) Other

B. Inspection

Scheduling

(a) City crews will inspect from the beginning of April to the end of November as weather and other conditions permit

(b) Group A Sidewalks and Group A Interlocking Paving Stones will be inspected annually on full-block lengths

(c) Group B Sidewalks and Group B Interlocking Paving Stones will be inspected on a four-year cycle (1/4 annually) on full-block lengths

(d) Regardless of grouping but subject to clause (a), all specific Sidewalk and Interlocking Paving Stone distresses and service request locations (not full blocks) of which the City receives Documented Notification will be inspected within 30 calendar days of the notification.

(e) Curb and Gutter, Medians and Islands and Miscellaneous Classifications will only be inspected based on Documented Notification, whether from City employees or the public. Subject to clause (a), specific distresses and service request locations (not full blocks) will be inspected within 45 calendar days of the notification.

Data Collection

Inspections will generally include recording each distress type and the physical characteristics of each type, such as measurable magnitude, length, width, etc.

Compilation

The inspection data will be compiled in a database that allows for:

(a) the generation of an annual prioritised list of maintenance locations;

(b) various network condition analyses;

(c) performance evaluations of the program; and

(d) the sorting of data by location magnitude or distress type.

APPENDIX B

ROADWAYS OPERATIONS
Maintenance Policy —Concrete

Purpose

This policy:

(a) Provides written inspection and maintenance standards to:

(i) Satisfy the City's statutory obligations;

(ii) Protect the City from liability; and

(iii) Increase the confidence of the City's insurer.

(b) Provides the basis for obtaining appropriate data on specific locations and conditions;

(c) Aids in the development of the annual concrete maintenance program;

(d) Creates a basis for analysing the City's network of concrete works; and

(e) Complements the Roadways Operations Inspection Policy — Concrete.

Definitions

Concrete Distress Types

Broken means a panel has two or more full-depth cracks and is broken into three or more pieces;

Cross Slope means heaving or settlement that has caused the cross slope of the concrete to vary from the normal design standard, whether to the street-side or to the back of the walk-side;

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Water Ponding means the settlement or heaving of concrete that results in poor drainage or the ponding of water on the surface of the concrete.

Curb-face height
Curb-face height means the distance from the top of a curb to the adjacent asphalt street surface.

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Director means the Director of Engineering and Works and anyone designated by the Director.

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Flatwork
Flatwork means the concrete, interlocking paving stones or asphalt surfacing located on the inside of median and traffic island curbs.

Group A Sidewalks

Group A Sidewalks (whether concrete and/or paving stones) are sidewalks that are:

(a) adjacent to the following zone designations from *The Regina Zoning Bylaw*, No. 9250:

(i) Residential — R6, R4A, C and TAR;
(ii) Commercial — LC3, DSC, MAC, D, MS and MAC3; and
(iii) Institutional — Hospitals, Public and Separate Schools

(b) adjacent to church or synagogue properties irrespective of zone designation

(c) adjacent to senior housing complex properties that have twenty or more living units irrespective of zone designation

(d) at selected locations on Street Priority 1 or 2 streets that connect larger concentrations of the zones identified in subsection a);

(e) located in easements which are within three hundred lineal meters of any other Group A sidewalk.

Group B Sidewalks

Group B Sidewalks are all other sidewalks in the City that are not Group A Sidewalks.

Street Priority

Street Priority means the classification of a block based on the street prioritisation system in the City's Winter Road Maintenance Program.

Total Budget — Concrete

Total Budget — Concrete means the sum of the annual budgets of the following activity accounts in the Roadways Operations Section: (1) Replacement of Walk and Curb; (2) Repair of Walks — Asphalt, (3) Wheelchair Ramp and (4) Boulevard/Median Repair.

Scope

This Policy addresses the concrete public works that are located on the public right-of-way and for which the Roadways and Traffic Division of the Engineering and Works Department is responsible, including:

(a) Sidewalks;

(b) Pedestrian ramps;

(c) On-street crosswalk areas (usually asphalt street surface) between Groups A Sidewalks;

(d) Interlocking paving stones installed by the City that are between the back of the street curb and the property line dividing public and private property;

(e) Curbs and gutters, both separate and attached;

(f) Medians and islands (including curb, gutter, and Flatwork).

Concrete works that are *not* addressed in this policy are:

(a) Walks, driveways, interlocking paving stones and other concrete works that are used as accesses to private property or that have been installed by or for a private property owner;

(b) Concrete works that are located in the F.W. Hill Mall, in City parks and open spaces, adjacent to City facilities or on the property controlled by the Wascana Centre Authority;

(c) Concrete walks, curbs, etc. that form parts of bridges or other structures.

Authority

This policy is established by City Council.

Contact

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P.O. Box 1790
2425 4th Avenue
Regina, Saskatchewan S4P 3C8

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Policy Statement

A. Allocation of Funding to Classifications, Groups, Street Priority and Distress Types

The City's maintenance activities under this Policy will be funded from the annual Total Budget — Concrete.

1. Classification Allocations

The Total Budget — Concrete will be allocated to each of the five classifications (Sidewalks, Interlocking Paving Stones, Curbs and Gutters, Medians and Islands, and Miscellaneous).

2. Sidewalk and Interlocking Paving Stone Classifications – Group Allocations

Funding for the Sidewalks and Interlocking Paving Stones Classifications will be assigned to one of the two Groups, A or B. [e.g. Sidewalk Group A Allocation, Interlocking Paving Stone Group A Allocation, etc.]

Sidewalk and Interlocking Paving Stone Classifications – Distress Type Allocations

Funding will be further assigned to one of the seven Sidewalk Distress Types (Broken, Cross Slope, Differential Settlement, Longitudinal Cracking, Spalling, Transverse Cracking, Water Ponding) and one of the three Interlocking Paving Stone Distress Types (Differential Settlement and Broken, Spalling, Cross Slope and Water Ponding).

3. Curbs and Gutters, Medians and Islands Classifications – Street Priority Allocations

Funding for the Curb and Gutter and Median and Islands Classifications will be assigned to one of the two Street Priorities, *Street Priority 1,2, &* 3 or *Street Priority 4* [e.g. Curb and Gutter Street Priority 1, 2 & 3 Allocation].

Curbs and Gutters and Medians and Islands Classifications – Distress Type Allocations

Funding will be further assigned to one of the four Curb and Gutter Distress Types (Differential Settlement and Transverse Cracking, Spalling and Broken, Cross Slope, Water Ponding) and one of the three Medians and Islands Distress Types (Curb-Spalling, Broken, Missing, etc., Curb-Face Height, Flatwork).

4. Miscellaneous Classification Type Allocations

Funding for the Miscellaneous Class with be assigned to one of the six types (new pedestrian ramp installations, private driveway crossings, private walk interfaces, special needs, cost sharing, other).

5. Annual Percentage Funding Allocations

The Director is authorised by City Council to establish the specific annual percentage of funding allocations to each Classification, Group, Street Priority, and Distress Type in accordance with the principles of this Policy. The precise allocations will be presented to City Council each year during the budget approval process.

6. Interim Discretionary Funding Allocations

If during any year it is determined that the annual percentage funding allocations cannot be accomplished or if critical unanticipated situations arise, then the Director may authorise interim adjustments to the allocations provided that the adjustments are not calculated to circumvent the principles of the allocation methodology.

B. Selecting Maintenance Locations

Following the principle of repairing distresses in a descending order of magnitude, the administration will develop an annual maintenance program by applying the funding allocations available under this Policy to the prioritised distress locations determined under the Roadways Operations Inspection Policy — Concrete.

C. Selecting Maintenance Methods

1. Lower Unit Cost Methods Preferred

The Roadways Operations staff will assess the possible maintenance methods that are reasonable and technically suitable for each maintenance location. The lower unit cost method that is technically suitable to the location and distress type will be used.

Some of the lower-cost maintenance methods include concrete grinding, asphalt capping and wedging, and mudjacking. For the purpose of this Policy, these methods will be considered as having equal unit costs.

2. Concrete Replacement

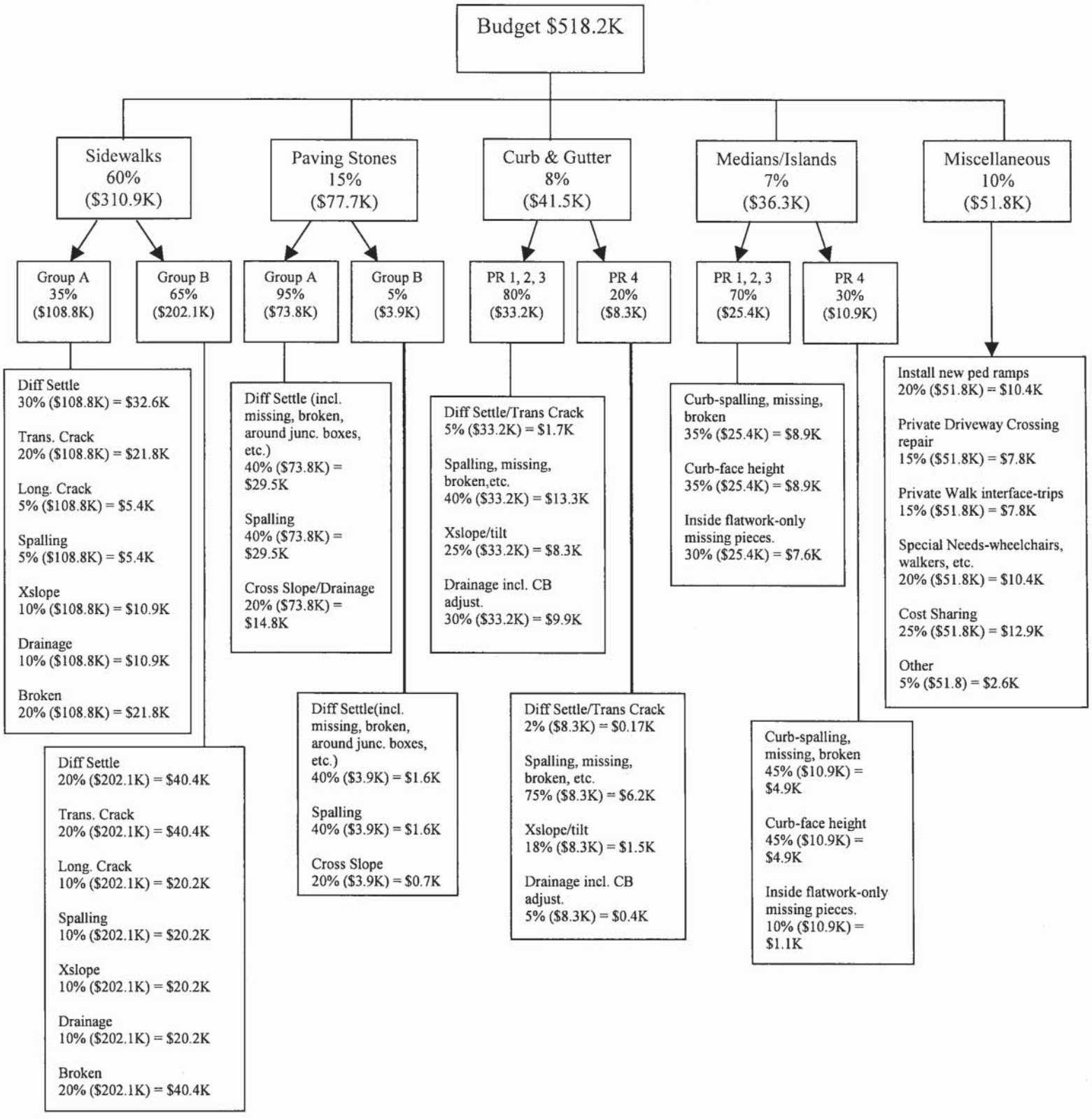
Concrete replacement will only be used if all the lower unit cost methods are technically unsuitable for a specific repair with the following exceptions:

(a) Group A Sidewalks will have no more than 0.5 square metres of asphalt capping or wedging for each individual distress; and

(b) Group B Sidewalks that are 20 years old or newer (based on the last full-block replacement or construction) will have no more than 0.5 square metres of asphalt capping or wedging for each individual distress.

Appendix C

ROADWAYS OPERATIONS – CONCRETE
Proposed Budget Percentage Allocation



Dollar value has been rounded.