

COMMITTEE OF THE WHOLE – SEPTEMBER 13, 2011

PAVEMENT MANAGEMENT PROGRAM UPDATE (2012 AND 2013)

(Deferred)

Council, at its meeting of June 28, 2011, adopted the following (Item 3, Report No. 35):

That consideration of this matter be deferred to the Committee of the Whole meeting of September 13, 2011.

Committee of the Whole (Working Session) recommendation of June 21, 2011:

That consideration of this matter be deferred to the Committee of the Whole meeting of September 13, 2011.

Report of the Commissioner of Engineering and Public Works, dated June 21, 2011

Recommendation

The Commissioner of Engineering and Public Works recommends:

1. That the Update to the Pavement Management Program for 2012 and 2013 be approved, in principle; and;
2. That the proposed projects be brought forward for submission as part of the 2012 and 2013 Budgets.

Contribution to Sustainability

Council at its meeting of April 2, 2007 (Item 1, Report No. 14, of the Committee of the Whole (Working Session), which can be found in Attachment 3) adopted without amendment a report outlining the City's proposed 5 Year Pavement Management Program for the years 2007 to 2011, which identified a number of activities to maintain, preserve, rehabilitate and replace the City's road infrastructure. The works identified will ensure that an acceptable level of service by the City's infrastructure is maintained for the health and well being of its citizens.

Analysis of current funding levels for the Pavement Management Program illustrate that the existing road network is projected to approach the minimum level of service threshold, Pavement Composite Index (PCI) of 70 out of 100 (possible points), by 2030. This does not account for any new roads that are assumed by the City that may impact service level projections.

Economic Impact

The 2 Year Update to the Pavement Management Program (PMP) will require an investment of \$18,320,615 (excluding interest). This funding level is consistent with previous funding levels for the PMP of approximately \$9M per year. Capital Funding is provided through the issuance of debentures while maintenance related costs are funded through the Operating Budget. The issuance of the long term debt will have an estimated interest cost of \$5,496,185 when the projects are complete.

The requirement per annum is broken down as follows:

| Year | Long Term Debenture (LTD) Amount | LTD Annual Principal & Interest On Issue | Annual Impact of Tax Rate (1%=1,410,074) | Cumulative Operating Budget Impact |
|--------------|---|---|--|---|
| 2012 | \$9,075,390 | \$1,164,320 | 0.83 % | 0.83% |
| 2013 | \$9,245,225 | \$1,186,110 | 0.84 % | 1.67% |
| Total | \$18,320,615 | \$2,350,430 | | |

The cumulative annual impact after year 2 of the update to the PMP, to the operating budget, as a result of issuing debentures in the amount of \$18,320,615, is \$2,350,430 or 1.67% on the tax rate. The payments will continue over the term of the debentures which typically has been 10 years.

The Long Term optimization of resources can be achieved through City initiatives such as the asset management strategies incorporated into the Pavement Management System. Modeling these figures within the Long Range Financial Planning Model so that future funding implications are known and can be planned for at the earliest possible time will allow for budgetary and/or program changes to be considered accordingly.

Communications Plan

Implementation of individual projects would be subject to the Engineering Services Department standard communication protocol. All affected residents will be notified during the pre-engineering, detailed design and construction phases of all projects.

Purpose

The purpose of this report is to obtain Council approval, in principle, for the update to the Pavement Management Program for the years 2012 and 2013.

Background - Analysis and Options

On April 2, 2007, Council approved the Pavement Management Program for the years 2007 to 2011. The philosophy behind this new pavement management strategy was a departure from the traditional roads program methodology implemented previously. Prior to 2007, these programs (Road Resurfacing, Road Reconstruction and Rural Road Upgrading) were prepared on a 'worst first' basis and road sections were evaluated utilizing factors such as traffic volumes and condition rating of the road facility. Consideration was also given to other factors such as roads in the same vicinity that are also deficient and that were constructed in the same era.

The PMP established a level of service for the entire road network, that would be measured using a Pavement Composite Index. An overall average PCI of 70 out of 100 possible points would be maintained. A prioritized listing of roads was developed for preventative maintenance, pavement preservation, road rehabilitation and reconstruction to meet this objective. The first 4 years of this program has been successfully delivered and the final year will be completed before the end of the 2011 construction season.

The Pavement Management Program is a planned system of treating pavements at the optimum time to maximize their useful life, resulting in enhanced pavement longevity at a minimized cost. Typically, a pavement will perform well until a certain point in their life span, at which time it deteriorates rapidly to failure. Treating a pavement prior to this point (early in its life cycle) eliminates or delays spending 10 to 20 times the cost on future, more extensive rehabilitation or reconstruction. The PMP is subdivided into four main categories; Preventative Maintenance, Preservation, Rehabilitation and Replacement.

Preventative Maintenance

Preventive maintenance is a culmination of activities undertaken to provide and maintain serviceable roads which may include some minor rehabilitation projects. It excludes pavements requiring major rehabilitation or reconstruction. The American Association of State Highway and Transportation Officials (AASHTO) has defined preventive maintenance as, "a planned strategy of cost effective treatments to an existing roadway system and its appurtenances that preserves the system, retards future deterioration, and maintains or improves the functional condition of the system (without substantially increasing structural capacity)." The treatment methods currently utilized for pavement preservation are crack sealing and drainage treatments. The Preventative Maintenance activities are delivered by the Public Works Department.

Preservation

Pavement Preservation utilizes timely and appropriate treatments that will have the cumulative effect of postponing costly rehabilitation, preventing the need for reconstruction, and improving overall pavement conditions. Timely preservation results in improved safety and mobility, and smoother, longer lasting pavements.

Experience shows that spending \$1 on pavement preservation eliminates or delays spending \$6 to \$10 dollars on future rehabilitation or reconstruction costs. Pavement preservation can result in a pavement receiving a treatment even when there is nothing apparently wrong with it. Micro surfacing is the preferred method utilized for pavement preservation.

Micro surfacing projects were carried out in 2009, and the product met the required performance expectations. However, as a result of aesthetic concerns identified, staff was directed to carry out a full review of the micro surfacing process. In 2010, the mix design was modified to improve the aesthetic characteristics of the treatment. The modifications resulted in improved aesthetic characteristics, however, the product did not meet other performance expectations.

Rehabilitation

Road rehabilitation is the partial or full removal of existing asphalt and the installation of new hot mix asphalt. It is important to note that the existing granular base remains untouched in rehabilitation projects. Experience shows that spending \$1 on rehabilitation at the ideal time in a pavement's life cycle will delay spending \$4 to \$5 dollars on future reconstruction costs. As a result, the majority of the proposed PMP (on a cost basis) utilizes this treatment method.

During the preliminary engineering stage of these projects, any surface and sub-base drainage deficiencies are identified, reviewed corrected. In addition, the structural integrity of the existing curb is assessed using the curb removal policy, and the quantity of curb removal is calculated. The treatments utilized for rehabilitation are mill and overlay, or removal and replacement of the existing asphalt.

Replacement

Road replacement is the removal of existing asphalt, granular base and concrete curb/curb and gutter and the construction of a new road (including new granular base, concrete curb and gutter and asphalt). This is the most expensive treatment method and is reserved for roads, at a point in their life cycle, that are structurally failing, and where the application of preventative maintenance, pavement preservation and/or rehabilitation would be ineffective. These roads have significant surface and sub-base drainage deficiencies and the structural integrity of concrete curbs and asphalt are considerably compromised. The treatment utilized for replacement is full road reconstruction.

Changes to the Pavement Management Program

Based on the experience gained from delivering the PMP from 2007 to 2011, the input criteria was reviewed by Engineering Services staff as part of the development of the update to the Pavement Management Program. New parameters were established and inputted to ensure a more efficient program. The following criterion was analyzed and evaluated:

1. Project Groupings

The road network analysis was completed on reviewing a grouping of roads within a subdivision as opposed to individual roads. Typically, roads within the same subdivision have similar characteristics such as pavement age, structural integrity and overall quality. In addition, there are a number of advantages that can be realized by developing a program that groups projects within the same geographic region. These advantages include economies of scale resulting in cost reductions, construction efficiencies and reduction in overall construction timelines, as well as improved customer service by reducing construction impact to residents.

2. Micro Surfacing

In 2009 and 2010 micro surfacing was piloted and introduced as part of pavement preservation activities. Based on the feedback received, micro surfacing will not be used on local and feeder roads within residential communities. However, this treatment will be considered on residential collector roads (4 lanes), industrial roads, and locations where skid resistance issues may exist.

3. Crack Sealing

All proposed mill and overlay and micro surfacing projects will undergo a crack sealing treatment within 4 years after completion. This will create an opportunity to seal any cracks that may migrate from the base asphalt to the surface. This would also assist in ensuring that the pavement will realize the greatest projected life cycle benefits.

4. Curb/Curb and Gutter Replacement

In order to meet residents' expectations, the following guidelines have been revised to reflect changes in the criteria regarding curb replacement for all rehabilitation and replacement projects.

A) All driveway curb lines, showing any extent of structural deficiencies, will be replaced for the entire width of the existing driveway curb depression. Principle structural deficiencies considered in determining replacement of curb/curb and gutter include, but are not necessarily limited to, the following:

- major stress cracks - greater than 2 per driveway entrance or longer than 500mm each
- any ponding area – standing water along the curb line/gutter
- curb misalignment – offset curb lines
- differential settlement - greater than 25mm high/low
- type of curb – not to City Standard
- any missing curb line sections
- other major defects affecting structural integrity or public safety

B) Driveways disturbed as a result of curb/curb and gutter replacements will be restored in kind to a maximum distance of 0.5m behind the curb in order to allow for any grade adjustments or “matching” to the existing driveway. Driveway aprons (the portion of driveways between the curb and sidewalk, within the City's right-of-way) will be completed replaced as part of the curb/curb and gutter replacements on

Rehabilitation projects. Any additional driveway replacement requested beyond these limits will be the responsibility of the property owner.

- C) Engineering Services will endeavour to replace all barrier curb with curb and gutter. During the preliminary engineering stages of rehabilitation and/or reconstruction projects, a feasibility study will be undertaken to determine the benefit of replacing existing barrier curb with curb and gutter.

5. Sidewalk Replacement

To date, the sidewalk replacement undertaken as part of the rehabilitation program was mainly identified on an “as needed” basis. Any sidewalk that has been identified as comprimized structurally or presents a hazard to pedestrians (such as trip, slip and fall, etc.) was removed and replaced to alleviate these issues. In future, to meet the requirements of the Accessibility for Ontarians with Disabilities Act (AODA) and as identified within the Engineering Services 2010 Accessibility Plan, all existing pedestrian ramps (sidewalks that lead to an intersection) will be retrofitted to include directional lines as part of any rehabilitation or replacement project.

Asset Management Methodology

On February 16, 2006, Council endorsed through resolution, InfraGuide and the best practices with respect to Asset Management. Through InfraGuide, a comprehensive business strategy involves three pillars: People, Information and Technology.

The Essential Elements of an Asset Management Plan are:

1. *What do you have and where is it?*
2. *What is it worth?*
3. *What is its condition and its expected service life?*
4. *What is the level of service expectation, what needs to be done?*
5. *When do you need to do it?*
6. *How much will it cost and what is the acceptable level of risk?*
7. *How do you ensure long term affordability?*

People, Information and Technology in practice with the Essential Elements is the key to a successful implementation of an Asset Management Plan.

It is within this framework that the Pavement Management Program Update is being reported.

1. What do you have and where is it?

The inventory of City owned active roads are summarized in the following table by Ward, Surface Material Type.

Table No.1

| Summary of Road Network - By Ward and Surface Material | | | |
|---|-------------------------|-----------------------------|-----------------------|
| Ward | Surface Material | Total Centreline kms | Total Lane kms |
| 1 | Gravel / Stone | 23.57 | 47.14 |
| | Asphalt | 176.18 | 379.04 |
| | Surface Treated | 24.88 | 49.77 |
| 2 | Gravel / Stone | 7.14 | 14.29 |

| Summary of Road Network - By Ward and Surface Material | | | |
|--|------------------|----------------------|----------------|
| Ward | Surface Material | Total Centreline kms | Total Lane kms |
| | Asphalt | 151.07 | 344.36 |
| | Surface Treated | 5.67 | 11.34 |
| 3 | Asphalt | 144.21 | 347.43 |
| 4 | Asphalt | 154.96 | 392.26 |
| 5 | Asphalt | 74.16 | 176.74 |
| | Surface Treated | 3.27 | 6.53 |
| Total | | 765.11 | 1768.9 |

2. What is it worth?

The 2010 City of Vaughan road network asset is valued at \$780M. Based on the reconstruction unit rate used within the Pavement Management System, staff have estimated the replacement value of the City's entire road network, to be approximately \$2.1B. This figure does not include the value for underground servicing such as water and wastewater systems nor boulevard amenities such as sidewalk or street lighting.

3. What is its condition and its expected service life?

The condition of a road is determined through a combination of field inspection and review of various analytical factors. Individual ratings and indices are combined into an overall index called a Pavement Composite Index (PCI) with an ascending range of 0 (worst) to 100 (best). This index is comprised of 3 major subsections being:

| | |
|-----------------------------|--|
| Health | The condition of a road which includes surface ride comfort, structural distresses and its ability to properly drain water away from the road's structural components; |
| Capacity | The current, measured traffic volume (Annual Average Daily Traffic) as compared to the theoretical capacity of a road; |
| Physical Environment | The remaining considerations surrounding the behavior of a road including skid resistance, safety and geometry. |

A complete definition and description of the Pavement Composite Index is included in Attachment No. 1.

According to the Pavement Management System, the projected average overall network condition (at the end of 2011) for all City roads is a PCI of 88 out of 100 possible points. The current average network condition distribution for all City roads is summarized in the following table:

Table No.2

| Pavement Management System Grouping | Value Range | Network Distribution |
|-------------------------------------|-------------|----------------------|
| Excellent | 80 to 100 | 92.3% |
| Good | 60 to 80 | 5.7% |
| Fair | 35 to 60 | 1.4% |
| Poor | 20 to 35 | 0% |
| Very poor | 0 to 20 | 0% |

4. What is the level of service expectation, what needs to be done?, and

5. When do you need to do it?

Setting a Level of Service (LOS) or a target, is an important and critical step in a proper Asset Management Plan. From Item 1, Report No. 28 of the Committee of the Whole (Working Session) on May 23, 2006, Council set a Level Of Service to maintain an overall average road network rating being a Pavement Composite Index (PCI) of 70 out of 100 (possible points).

Applicable treatments that fall within Capital and Operations and Maintenance Budget categories are as follows:

| Budget Type | Treatment Name |
|--------------------|-------------------------|
| Operating | Crack Seal |
| Operating | Drainage Treatment |
| Capital | Complete Reconstruction |
| Capital | LCB Surface Treatment |
| Capital | LCB Upgrade To HCB |
| Capital | Micro Surface |
| Capital | Mill And Overlay |
| Capital | Pulverize And Overlay |
| Capital | Remove And Replace |

Attachment No. 2 includes a detailed Project Level Program This list is sorted by the following criteria:

- Year
- Treatment Name
- Street Name
- Street From
- Street To

Please note that the Pavement Management Program reflects a shift to more preventative and rehabilitative methods of intervening strategies in the lifecycle of a road such as Crack Sealing, Micro Surfacing and Mill and Overlay. This philosophy will provide the City with its greatest return on every dollar invested to maximize the life of our road asset.

6. How much will it cost and what is the acceptable level of risk?

Based on the target Level of Service, investment required over the next 2 years are as follows:

| Year | Capital Budget |
|-------------|-----------------------|
| 2012 | \$9,075,390 |
| 2013 | \$9,245,225 |

Ongoing discussions take place with staff of our Public Works Department regarding the conditions of existing underground services such as storm and sanitary sewers and water mains. If there is also a potential need to perform substantial repairs or replacement of underground services in the near future, then the road need in those locations will be aligned to remedy both deficiencies at the same time.

7. How do you ensure long term affordability?

As the City's road infrastructure, information, systems and technology matures, multi-faceted integration across all asset classes such as roads, structures, pipes and amenities will be

realized. This is a natural path not only from an engineering technical analysis but should also be embraced from a financial perspective.

We must acknowledge that activities such as Crack Sealing and Drainage Treatment directly affect the lifecycle of a road. Future funding requirements will shift year to year between preventative and rehabilitative types of intervention such as Crack Sealing and Mill and Overlay.

Ensuring that the funding requirements are captured in the long range financial planning model, and that any increases to proposed funding requirements are supported, will ensure that the road network is maintained at our target Level of Service.

Meeting the target level of service is critical to maximize the benefit for every dollar invested in road rehabilitation which will directly reduce costly future road reconstruction. Should current and future funding levels not be supported, the risk of further deterioration of roads, a reduced level of serviceability and an increase in long term maintenance costs for our road system, without the opportunity to achieve sustainability.

Relationship to Vaughan Vision 2020/Strategic Plan

In consideration of the strategic priorities related to Vaughan Vision 2020, the recommendations of this report will assist in:

- Maintaining corporate assets and infrastructure;
- Enhance environmental sustainability and a healthier environment through the use of alternative construction methodologies; and,
- In compliance with Green Directions Vaughan – Community Sustainability and Environmental Master Plan – the need to support the continuing repair and renewal of our road network is facilitated.

This report is consistent with the priorities previously set by Council.

Regional Implications

There are no Regional implications.

Conclusion

The purpose of this report is to obtain Council approval, in principle, for the update to the Pavement Management Program for the years 2012 and 2013.

Attachments

1. Summary of Terms
2. 2012 and 2013 Update to the Pavement Management Program
3. Extract from Council Meeting Minutes – April 2, 2007 – 5 Year Pavement Management Program

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ATTACHMENT NO. 1

Summary of Terms

The Pavement Composite Index (PCI) definition

| PAVEMENT COMPOSITE INDEX (PCI) RATING | | | | | |
|---------------------------------------|-----------------|---------------------|----------------|-----------------|-------------|
| Category | Category Weight | Variable | Variable Point | Variable Weight | Methodology |
| Health | 80% | Surface Condition | 0 - 10 | 40% | MDC |
| | | Structural Adequacy | 0 - 20 | 40% | MDC |
| | | Drainage | 0 - 15 | 20% | R |
| Capacity | 10% | Capacity | 0 - 100 | 100% | MDC |
| Physical Environment | 10% | Skid | | 0% | - |
| | | Safety | 0 - 100 | 50% | AC |
| | | Geometry | 0 - 100 | 50% | AC |

Methodology Terminology

| | |
|---------------------------------|---|
| Model Deterioration Curve (MDC) | Subject has a separate life cycle model applied to it to predict future performance. |
| Rating (R) | Subject has a rating and forms part of a greater computation. |
| Analyze and Compute (AC) | Subject is studied for various conditions and a rating is computed based on the analysis. |

General Terminology

| | |
|---------------|--|
| Network Level | Reviewing a particular piece of information or state with respect to all City roads as a whole. |
| Project Level | Reviewing a particular piece of information or state with respect to an individual roads section as defined by a road, from an intersection, to an intersection. |

Health Terminology

| | |
|---------------------|---|
| Surface Condition | Maximum 10 Point Rating related to driving ease, comfort and safety. Inadequacies for paved surfaces include excessive or uneven crowns, washboarding, raveling and bumpiness because of cracking, sealing and rough patching. Inadequacies on loose top surfaces do not include situations that can be readily corrected by maintenance blading. |
| Structural Adequacy | Maximum 20 Point Rating related to the capability of the surface and base courses to support a load and to resist deformation or rupture. Distress signs include cracking, rutting, heaving, pot-holing, roughness, alligatoring, dishing, breakup, distortion, frost boils, soft spots, etc. |

Drainage Maximum 15 Point Rating related the various elements to maintain a well drained surface on a stable subgrade: the height of the grade line; the cross slopes of the crown, shoulders and ditches; the slopes of gutters and frequency of outlets or catchbasins and the adequacy of the storm sewer system; the capacity of the cross-drains (culverts) and parallel and off-take ditches.

Capacity Terminology

Capacity The Capacity index is a function of the annual traffic volume and the capacity of the road.

Physical Environment Terminology

Skid A measure of skid resistance for future implementation
Safety The safety index is a calculation which is a function of the AADT and the rate and severity of crashes on a road section.

Where Geometry is comprised of the following:

Horizontal Alignment Maximum 10 Point Rating related to the number of Substandard Horizontal Curves and Substandard Horizontal Stopping Sight Distances per length of road section.

Vertical Alignment Maximum 10 Point Rating related to the number of Substandard Grades and Substandard Vertical Stopping Sight Distances per length of road section.

Other

HCB High Class Bituminous (Asphalt Pavement)

LCB Low Class Bituminous (Surface Treatment)

ATTACHMENT NO. 2

2012 and 2013 Update to the Pavement Management Program

| 2012 Pavement Management Program | | | | | |
|----------------------------------|-----------------------|-----------------------|---------------------|------------------|--------------|
| Year | Street | From | To | Treatment Name | Cost |
| 2012 | Aberdeen Avenue | Queenston Crescent | Highway 7 | Crack Seal | \$12,344.83 |
| 2012 | Aberdeen Avenue | Belview Avenue | Queenston Crescent | Mill And Overlay | \$260,830.57 |
| 2012 | Adam Ernst Court | Seshi Drive | Cul-De-Sac | Crack Seal | \$267.94 |
| 2012 | Airdrie Drive | Aberdeen Avenue | Aberdeen Avenue | Crack Seal | \$5,745.64 |
| 2012 | Albion Vaughan Road | Kirby Road | King Vaughan Road | Drainage Major | \$7,083.21 |
| 2012 | Alderson Avenue | Pine Valley Drive | Aberdeen Avenue | Crack Seal | \$2,190.12 |
| 2012 | Alex Avenue | Strada Drive | Rowntree Dairy Road | Mill And Overlay | \$75,723.77 |
| 2012 | Alliston Road | Aberdeen Avenue | Airdrie Drive | Crack Seal | \$1,299.32 |
| 2012 | America Avenue | Jane Street | Dead End | Crack Seal | \$5,999.73 |
| 2012 | Amy Court | Belview Avenue | Belview Avenue | Crack Seal | \$1,856.35 |
| 2012 | Amy Wood Road | Kingsview Drive | Maria Antonia Road | Crack Seal | \$2,197.57 |
| 2012 | Andrea Lane | Aberdeen Avenue | Ashcroft Court | Crack Seal | \$2,403.43 |
| 2012 | Andy Crescent | Dolores Crescent | Andy Crescent | Crack Seal | \$4,486.37 |
| 2012 | Ansley Grove Road | Embassy Drive | Highway 7 | Mill And Overlay | \$253,387.26 |
| 2012 | Antonella Crescent | Chancellor Drive | Chancellor Drive | Crack Seal | \$2,453.88 |
| 2012 | Antonia Court | Dolores Crescent | Cul-De-Sac | Crack Seal | \$903.08 |
| 2012 | Ashbridge Circle | Highway 27 | Dead End | Crack Seal | \$2,595.08 |
| 2012 | Ashburn Crescent | Airdrie Drive | Airdrie Drive | Crack Seal | \$1,762.55 |
| 2012 | Ashcroft Court | Aberdeen Avenue | Cul-De-Sac | Crack Seal | \$965.94 |
| 2012 | Attorney's Lane | Forest Drive | Cul-De-Sac | Mill And Overlay | \$30,526.92 |
| 2012 | Audla Court | North Rivermede Road | Cul-De-Sac | Mill And Overlay | \$52,320.67 |
| 2012 | Autumn Hill Boulevard | Thornhill Woods Drive | Daphnia Drive | Crack Seal | \$3,391.25 |
| 2012 | Avon Crescent | Airdrie Drive | Alliston Road | Crack Seal | \$1,066.46 |
| 2012 | Avro Road | Kale Crescent | Jane Street | Crack Seal | \$2,437.92 |
| 2012 | Bachman Drive | Via Lanciano Crescent | Emmitt Road | Crack Seal | \$436.69 |
| 2012 | Bachman Drive | Wilcox Road | Norwood Avenue | Crack Seal | \$450.89 |
| 2012 | Baldwin Avenue | Southview Drive | Highway 7 | Crack Seal | \$2,020.57 |
| 2012 | Basie Gate | Pleasant Ridge Avenue | Chagall Drive | Crack Seal | \$897.75 |
| 2012 | Beatrice Way | Fiori Drive | Vera Street | Crack Seal | \$3,875.02 |
| 2012 | Bella Vista Court | Belview Avenue | Cul-De-Sac | Crack Seal | \$647.08 |
| 2012 | Belview Avenue | Chancellor Drive | Coalbrooke Court | Crack Seal | \$2,056.11 |
| 2012 | Blaine Court | Trevor Street | Cul-De-Sac | Crack Seal | \$1,854.04 |
| 2012 | Blue Willow Drive | Weston Road | Pottery Place | Mill And Overlay | \$76,630.22 |
| 2012 | Blue Willow Drive | Michelle Drive | Embassy Drive | Mill And Overlay | \$167,592.39 |
| 2012 | Bluestone Street | Medallion Boulevard | Sungold Court | Mill And Overlay | \$65,094.83 |
| 2012 | Bordeaux Drive | Alderson Avenue | Brougham Drive | Crack Seal | \$1,804.17 |
| 2012 | Bordeaux Drive | Western Skies Court | Chancellor Drive | Crack Seal | \$491.36 |
| 2012 | Bordeaux Drive | Brougham Drive | Western Skies Court | Mill And Overlay | \$45,356.56 |
| 2012 | Bradwick Drive | Highway 7 | Cul-De-Sac | Crack Seal | \$9,760.32 |

| 2012 Pavement Management Program | | | | | |
|----------------------------------|-----------------------|--------------------------|------------------------|--------------------|--------------|
| Year | Street | From | To | Treatment Name | Cost |
| 2012 | Brandy Crescent | Alderson Avenue | Alderson Avenue | Crack Seal | \$1,820.12 |
| 2012 | Brougham Drive | Aberdeen Avenue | Bordeaux Drive | Crack Seal | \$1,392.28 |
| 2012 | Brussels Court | Alderson Avenue | Cul-De-Sac | Crack Seal | \$235.96 |
| 2012 | Buckhorn Road | Yellowwood Circle | Yellowwood Circle | Crack Seal | \$793.04 |
| 2012 | Burgosa Court | Russet Way | Cul-De-Sac | Remove And Replace | \$270,483.13 |
| 2012 | Cabalotta Crescent | Medallion Boulevard | Coronation Street | Mill And Overlay | \$70,908.60 |
| 2012 | Cabinet Crescent | Morning Star Drive | Morning Star Drive | Mill And Overlay | \$123,531.93 |
| 2012 | Calabria Court | Castelpoint Drive | Cul-De-Sac | Crack Seal | \$298.81 |
| 2012 | Cape Verde Way | Naples Avenue | Madeira Avenue | Crack Seal | \$719.28 |
| 2012 | Cantright Boulevard | Malden Street | Velmar Drive | Crack Seal | \$511.20 |
| 2012 | Casa Nova Drive | Davos Road | Kingsview Drive | Crack Seal | \$2,235.12 |
| 2012 | Casmir Court | Spinnaker Way | Cul-De-Sac | Crack Seal | \$943.39 |
| 2012 | Caster Avenue | Whitmore Road | Trowers Road | Mill And Overlay | \$157,590.65 |
| 2012 | Castlepoint Drive | Dolores Crescent | Stollia Street | Crack Seal | \$3,550.03 |
| 2012 | Cedar Glen Court | Forest Heights Boulevard | Cul-De-Sac | Crack Seal | \$824.50 |
| 2012 | Cedarvalley Crescent | Stevenson Road | Cul-De-Sac | Crack Seal | \$1,454.12 |
| 2012 | Cezanne Trail | Coltrane Drive | Auburndale Drive | Crack Seal | \$1,337.04 |
| 2012 | Chagall Drive | Coltrane Drive | Autumn Hill Boulevard | Crack Seal | \$1,554.24 |
| 2012 | Chancellor Drive | Weston Road | Anslay Grove Road | Crack Seal | \$7,509.71 |
| 2012 | Charles Cooper Court | Nashville Road | Cul-De-Sac | Crack Seal | \$1,554.01 |
| 2012 | Charmaine Road | Dorengate Drive | Kiloran Avenue | Crack Seal | \$3,218.92 |
| 2012 | Chart Avenue | Naples Avenue | Madeira Avenue | Crack Seal | \$783.73 |
| 2012 | Chateau Drive | Davos Road | Casa Nova Drive | Crack Seal | \$1,740.08 |
| 2012 | Citation Drive | Stafferin Drive | Cul-De-Sac | Crack Seal | \$797.02 |
| 2012 | Citron Court | Spinnaker Way | Cul-De-Sac | Crack Seal | \$619.31 |
| 2012 | Coalbrook Court | Cul-De-Sac | Cul-De-Sac | Crack Seal | \$1,736.34 |
| 2012 | Coldspring Road | Nashville Road | Cul-De-Sac | Crack Seal | \$1,586.11 |
| 2012 | Coltrane Drive | Thornhill Woods Drive | Pleasant Ridge Avenue | Crack Seal | \$2,648.89 |
| 2012 | Confederation Parkway | Dufferin Street | Westway Crescent | Crack Seal | \$8,462.96 |
| 2012 | Connie Crescent | Langstaff Road | North Rivermede Road | Crack Seal | \$4,611.47 |
| 2012 | Convoy Crescent | John Deisman Boulevard | John Deisman Boulevard | Crack Seal | \$2,638.11 |
| 2012 | Coronation Street | Gates Road | Morning Star Drive | Mill And Overlay | \$164,263.77 |
| 2012 | Couture Gardens | Pleasant Ridge Avenue | Treecrest Drive | Crack Seal | \$2,248.73 |
| 2012 | Degas Drive | Gauguin Avenue | Pleasant Ridge Avenue | Crack Seal | \$1,465.68 |
| 2012 | Diamond Street | Morning Star Drive | Cabinet Crescent | Mill And Overlay | \$31,628.50 |
| 2012 | Discovery Trail | America Avenue | Tierra Avenue | Crack Seal | \$2,910.03 |
| 2012 | Dolores Crescent | Martin Grove Road | Martin Grove Road | Crack Seal | \$2,836.29 |
| 2012 | Dorengate Drive | Figlen Ridge | Cul-De-Sac | Crack Seal | \$1,375.21 |
| 2012 | Dorwood Court | Figlen Ridge | Cul-De-Sac | Crack Seal | \$1,094.16 |
| 2012 | Emily Anna Street | Sheshi Drive | Maria Antonia Road | Crack Seal | \$567.36 |
| 2012 | Emmitt Road | Bachman Drive | Avro Road | Crack Seal | \$367.12 |
| 2012 | English Daisy Court | Whisper Lane | English Daisy Court | Crack Seal | \$1,439.94 |

| 2012 Pavement Management Program | | | | | |
|----------------------------------|--------------------------|-----------------------|------------------------|--------------------|--------------|
| Year | Street | From | To | Treatment Name | Cost |
| 2012 | Equator Crescent | Discovery Trail | Genoa Road | Crack Seal | \$3,731.80 |
| 2012 | Ferdinand Avenue | Discovery Trail | John Deisman Boulevard | Crack Seal | \$2,150.77 |
| 2012 | Fieldstone Drive | Weston Road | Blue Willow Drive | Crack Seal | \$3,930.20 |
| 2012 | Florentia Court | Dolores Crescent | Cul-De-Sac | Crack Seal | \$229.33 |
| 2012 | Firenza Road | Fossil Hill Road | Kingsview Drive | Crack Seal | \$915.02 |
| 2012 | Floral Parkway | Confederation Parkway | Cul-De-Sac | Crack Seal | \$1,362.64 |
| 2012 | Fonti Drive | Villa Royale Avenue | Hollywood Hill Circle | Crack Seal | \$307.55 |
| 2012 | Forest Drive | Attorneys Lane | Jade Crescent | Mill And Overlay | \$53,295.38 |
| 2012 | Forest Heights Boulevard | Highway 27 | Cul-De-Sac | Crack Seal | \$2,385.93 |
| 2012 | Fossil Hill Road | Davos Road | Firenza Road | Crack Seal | \$1,791.43 |
| 2012 | Fossil Hill Road | Hollywood Hill Circle | Marla Antonia Road | Crack Seal | \$1,251.96 |
| 2012 | Foxchase Avenue | Blue Willow Drive | Fieldstone Drive | Crack Seal | \$2,363.80 |
| 2012 | Gaelano Court | Dolores Crescent | Cul-De-Sac | Crack Seal | \$680.73 |
| 2012 | Gauguin Avenue | Summeridge Drive | Pleasant Ridge Avenue | Crack Seal | \$2,662.90 |
| 2012 | Gemma Court | Rockview Gardens | Cul-De-Sac | Crack Seal | \$539.96 |
| 2012 | Genoa Road | America Avenue | Naples Avenue | Crack Seal | \$1,394.25 |
| 2012 | George Gale Road | Sheshi Drive | Marla Antonia Road | Crack Seal | \$565.02 |
| 2012 | Getz Park | Pleasant Ridge Avenue | Collrane Drive | Crack Seal | \$808.54 |
| 2012 | Glenvilla Road | Chancellor Drive | Cul-De-Sac | Crack Seal | \$960.95 |
| 2012 | Gould Lane | Pleasant Ridge Avenue | Chagall Drive | Crack Seal | \$851.07 |
| 2012 | Governor Crescent | Aberdeen Avenue | Aberdeen Avenue | Remove And Replace | \$379,782.10 |
| 2012 | Grant Crest Gate | Coalbrooke Court | Pottery Place | Crack Seal | \$428.32 |
| 2012 | Gully Lane | America Avenue | Stern Gate | Crack Seal | \$621.61 |
| 2012 | Haist Avenue | Marycroft Avenue | Rowntree Dairy Road | Mill And Overlay | \$120,578.64 |
| 2012 | Hartley Court | Rockview Gardens | Cul-De-Sac | Crack Seal | \$473.39 |
| 2012 | Hedgerow Court | Hedgerow Lane | Cul-De-Sac | Crack Seal | \$950.53 |
| 2012 | Hedgerow Lane | Highway 27 | Cul-De-Sac | Crack Seal | \$2,810.94 |
| 2012 | Hendel Drive | Pleasant Ridge Avenue | Couture Gardens | Crack Seal | \$1,403.19 |
| 2012 | Hillside Drive | Baldwin Avenue | Highway 7 | Crack Seal | \$3,274.73 |
| 2012 | Hollyburn Court | Morning Star Drive | Cul-De-Sac | Mill And Overlay | \$9,518.52 |
| 2012 | Hollywood Hill Circle | Fossil Hill Road | Fossil Hill Road | Crack Seal | \$3,922.14 |
| 2012 | Humber Bridge Trail | Dead End | Highway 27 | Drainage Major | \$929.92 |
| 2012 | Huntington Road | King Vaughan Road | Ranch Trail Road | Crack Seal | \$623.47 |
| 2012 | Imperial Court | Misty Meadow Drive | Cul-De-Sac | Crack Seal | \$387.69 |
| 2012 | Iona Crescent | Andy Crescent | Andy Crescent | Crack Seal | \$1,255.29 |
| 2012 | Irish Moss Court | Misty Meadow Drive | Cul-De-Sac | Crack Seal | \$736.90 |
| 2012 | Isa Court | Dolores Crescent | Cul-De-Sac | Crack Seal | \$867.29 |
| 2012 | Ivy Place | Queen Post Drive | Queen Post Drive | Crack Seal | \$297.33 |
| 2012 | Jacobi Court | Pleasant Ridge Avenue | Cul-De-Sac | Crack Seal | \$775.97 |
| 2012 | Jade Crescent | Coronation Street | Coronation Street | Mill And Overlay | \$104,781.30 |
| 2012 | Jardin Drive | Keele Street | Cul-De-Sac | Crack Seal | \$4,363.82 |
| 2012 | Jeanne Drive | Villa Park Drive | Willis Road | Crack Seal | \$2,899.07 |

| 2012 Pavement Management Program | | | | | |
|----------------------------------|------------------------|----------------------|----------------------------|-----------------------|--------------|
| Year | Street | From | To | Treatment Name | Cost |
| 2012 | John Deisman Boulevard | Tierra Avenue | John Deisman Boulevard | Tierra Avenue | \$1,547.35 |
| 2012 | Journal Avenue | America Avenue | Ferdinand Avenue | Crack Seal | \$1,038.52 |
| 2012 | Jules Avenue | Jeanne Drive | Jeanne Drive | Crack Seal | \$2,467.30 |
| 2012 | Kale Crescent | Avro Road | Avro Road | Crack Seal | \$3,010.90 |
| 2012 | Karta Court | Michelle Drive | Cul-De-Sac | Crack Seal | \$287.76 |
| 2012 | Keeleview Court | Hillside Drive | Cul-De-Sac | Crack Seal | \$1,087.13 |
| 2012 | Kendall Drive | Wycliffe Avenue | Korright Place | Crack Seal | \$494.94 |
| 2012 | King Vaughan Road | Huntington Road | Highway 27 | Crack Seal | \$8,249.65 |
| 2012 | King Vaughan Road | Huntington Road | Huntington Road | Crack Seal | \$215.04 |
| 2012 | King Vaughan Road | Highway 27 | Huntington Road | Pulverize And Overlay | \$368,078.75 |
| 2012 | Kingsview Drive | Davos Road | Maria Antonia Road | Crack Seal | \$2,768.49 |
| 2012 | Kipling Avenue | Toston Road | King Vaughan Road | Crack Seal | \$12,849.31 |
| 2012 | Kipling Avenue | Abell Avenue | Woodbridge Avenue | Reconstruction | \$429,847.28 |
| 2012 | Kirby Road | Kipling Avenue | Highway 27 | Crack Seal | \$8,200.30 |
| 2012 | Kleins Crescent | Nashville Road | Nashville Road | Mill And Overlay | \$48,031.76 |
| 2012 | Klein's Ridge | Nashville Road | Cul-De-Sac | Crack Seal | \$1,577.41 |
| 2012 | Lamp Crescent | Morning Star Drive | Morning Star Drive | Mill And Overlay | \$92,422.49 |
| 2012 | Laneway 18281 20430 | Foxchase Avenue | Laneway | Crack Seal | \$241.65 |
| 2012 | Laneway 18282 18281 | Cul-De-Sac | Laneway | Crack Seal | \$157.24 |
| 2012 | Laneway 18282 18281 | Laneway | Cul-De-Sac | Crack Seal | \$121.30 |
| 2012 | Langstaff Road | Vaughan Mills Road | Highway 27 | Crack Seal | \$7,145.85 |
| 2012 | Lanterna Crescent | Castlepoint Drive | Castlepoint Drive | Crack Seal | \$1,564.29 |
| 2012 | Lavender Place | Mathew Drive | Mathew Drive | Crack Seal | \$1,291.26 |
| 2012 | Lento Court | Wilfrid Road | Cul-De-Sac | Crack Seal | \$1,125.98 |
| 2012 | Leyton Road | Belview Avenue | Lime Drive | Crack Seal | \$487.25 |
| 2012 | Lorengate Place | Figlen Ridge | Cul-De-Sac | Crack Seal | \$415.63 |
| 2012 | Lucky Court | Flori Drive | Cul-De-Sac | Crack Seal | \$735.38 |
| 2012 | Macbride Crescent | Kale Crescent | Kale Crescent | Crack Seal | \$1,371.18 |
| 2012 | Madeira Avenue | Genoa Road | Equator Crescent | Crack Seal | \$1,033.22 |
| 2012 | Marco Crescent | Aldrie Drive | Aldrie Drive | Crack Seal | \$1,507.46 |
| 2012 | Margaret Mary Road | Figlen Ridge | Dead End | Crack Seal | \$285.67 |
| 2012 | Maria Antonia Road | Weston Road | Amy Wood Road | Crack Seal | \$6,907.51 |
| 2012 | Marrone Street | Amy Wood Road | Maria Antonia Road | Crack Seal | \$669.73 |
| 2012 | Martin Grove Road | Sticilia Street | Highway 27 | Crack Seal | \$6,989.63 |
| 2012 | Martin Grove Road | Highway 7 | Woodbridge Avenue | Mill And Overlay | \$245,031.24 |
| 2012 | Martin Grove Road | Morning Star Drive | Langstaff Road | Mill And Overlay | \$48,974.49 |
| 2012 | Marycroft Avenue | Rowntree Dairy Road | Highway 7 | Mill And Overlay | \$259,841.22 |
| 2012 | Matthew Drive | Wilfrid Road | Mathew Drive | Crack Seal | \$4,280.66 |
| 2012 | Maximilian Street | Sheshi Drive | Maria Antonia Road | Crack Seal | \$569.26 |
| 2012 | Mazzone Drive | Amy Wood Road | Maria Antonia Road | Crack Seal | \$575.84 |
| 2012 | Monaughton Road | Cransion Park Avenue | Major Mackenzie Drive West | Crack Seal | \$3,631.42 |
| 2012 | Medallion Boulevard | Gates Road | Cabaletta Crescent | Mill And Overlay | \$17,303.23 |

| 2012 Pavement Management Program | | | | | |
|----------------------------------|------------------------|--------------------------|----------------------------|--------------------|--------------|
| Year | Street | From | To | Treatment Name | Cost |
| 2012 | Melville Avenue | Avro Road | Major Mackenzie Drive West | Crack Seal | \$3,769.21 |
| 2012 | Mindel Crescent | Pleasant Ridge Avenue | Pleasant Ridge Avenue | Crack Seal | \$1,425.29 |
| 2012 | Michelle Drive | Blue Willow Drive | Blue Willow Drive | Crack Seal | \$2,788.39 |
| 2012 | Minton Drive | Blue Willow Drive | Foxchase Avenue | Crack Seal | \$647.85 |
| 2012 | Misty Meadow Drive | Ansley Grove Road | Queenston Crescent | Crack Seal | \$4,076.08 |
| 2012 | Monica Court | Antonella Crescent | Cul-De-Sac | Crack Seal | \$277.66 |
| 2012 | Morisset Avenue | Pleasant Ridge Avenue | Courture Gardens | Crack Seal | \$1,524.33 |
| 2012 | Morning Star Drive | Maples Avenue | Martin Grove Road | Mill And Overlay | \$261,179.53 |
| 2012 | Naples Avenue | Discovery Trail | Equator Crescent | Crack Seal | \$1,277.53 |
| 2012 | Native Trail | Treasure Road | Ferdinand Avenue | Crack Seal | \$890.78 |
| 2012 | Nestor Crescent | Embassy Drive | Embassy Drive | Remove And Replace | \$461,286.37 |
| 2012 | Nickle Gate | Highway 27 | Morning Star Drive | Mill And Overlay | \$59,038.62 |
| 2012 | Nicola Court | Antonella Crescent | Cul-De-Sac | Crack Seal | \$326.97 |
| 2012 | North Rivermede Road | Langstaff Road | Connie Crescent | Crack Seal | \$1,924.14 |
| 2012 | North Rivermede Road | Rivermede Road | Highway 7 | Crack Seal | \$4,720.81 |
| 2012 | North Rivermede Road | Connie Crescent | Rivermede Road | Mill And Overlay | \$235,890.37 |
| 2012 | Ocean Avenue | America Avenue | Santa Maria Trail | Crack Seal | \$800.34 |
| 2012 | Old Humber Crescent | Forest Heights Boulevard | Forest Heights Boulevard | Crack Seal | \$3,738.46 |
| 2012 | Opera Place | Lento Court | Cul-De-Sac | Crack Seal | \$435.38 |
| 2012 | Otona Court | Rivermede Road | Cul-De-Sac | Crack Seal | \$2,143.92 |
| 2012 | Panorama Crescent | Royalpark Way | Royalpark Way | Crack Seal | \$2,249.41 |
| 2012 | Pennycross Court | Kiloran Avenue | Cul-De-Sac | Crack Seal | \$934.56 |
| 2012 | Pine Valley Drive | Langstaff Road | Clubhouse Road | Crack Seal | \$4,786.12 |
| 2012 | Pleasant Ridge Avenue | Summeridge Drive | Autumn Hill Boulevard | Crack Seal | \$4,987.77 |
| 2012 | Positview Court | Torran Road | Cul-De-Sac | Crack Seal | \$353.58 |
| 2012 | Pottery Place | Blue Willow Drive | Windflower Gate | Crack Seal | \$1,850.06 |
| 2012 | Presidential Street | Governor Crescent | Governor Crescent | Remove And Replace | \$156,842.63 |
| 2012 | Putting Green Crescent | Coldspring Road | Coldspring Road | Crack Seal | \$1,446.39 |
| 2012 | Queen Post Drive | Villa Park Drive | Cul-De-Sac | Crack Seal | \$797.44 |
| 2012 | Queenston Crescent | Aberdeen Avenue | Aberdeen Avenue | Crack Seal | \$1,513.84 |
| 2012 | Ranch Trail Road | Huntington Road | Cul-De-Sac | Crack Seal | \$3,308.06 |
| 2012 | Ravine Court | Sylvan Brook Avenue | Cul-De-Sac | Crack Seal | \$988.69 |
| 2012 | Renoir Drive | Coltrane Drive | Autumn Hill Boulevard | Crack Seal | \$902.31 |
| 2012 | Ritun Lane | Spinnaker Way | Cul-De-Sac | Crack Seal | \$1,094.73 |
| 2012 | Rockview Gardens | Baldwin Avenue | Keele Street | Crack Seal | \$3,774.20 |
| 2012 | Rockview Gardens | Hartley Court | Baldwin Avenue | Crack Seal | \$583.48 |
| 2012 | Roe Road | Huntington Road | Nashville Road | Crack Seal | \$1,270.20 |
| 2012 | Romano Crescent | Chancellor Drive | Chancellor Drive | Crack Seal | \$1,906.28 |
| 2012 | Rowntree Dairy Road | Weston Road | Marycroft Avenue | Mill And Overlay | \$932,452.00 |
| 2012 | Royal Garden Boulevard | Pine Valley Drive | Ravine Court | Crack Seal | \$1,585.18 |
| 2012 | Royalpark Way | Highway 27 | Vaughan Mills Road | Crack Seal | \$12,594.50 |
| 2012 | Russet Way | Ansley Grove Road | Chancellor Drive | Remove And Replace | \$660,676.28 |

| 2012 Pavement Management Program | | | | | |
|----------------------------------|---------------------|-----------------------|-----------------------|------------------|--------------|
| Year | Street | From | To | Treatment Name | Cost |
| 2012 | Sail Crescent | Discovery Trail | Discovery Trail | Crack Seal | \$2,698.65 |
| 2012 | San Marko Place | Chancellor Drive | Cul-De-Sac | Crack Seal | \$683.56 |
| 2012 | Santa Maria Trail | Discovery Trail | Ferdinand Avenue | Crack Seal | \$2,447.32 |
| 2012 | Sassafras Circle | Sassafras Circle | Cul-De-Sac | Crack Seal | \$3,539.63 |
| 2012 | Scholar Road | Confederation Parkway | Spinnaker Way | Crack Seal | \$1,564.60 |
| 2012 | Seurat Place | Coltrane Drive | Autumn Hill Boulevard | Crack Seal | \$1,111.75 |
| 2012 | Sharer Road | Whitmore Road | Towers Road | Mill And Overlay | \$157,451.62 |
| 2012 | Sheshi Drive | Fossil Hill Road | Maria Antonia Road | Crack Seal | \$2,116.63 |
| 2012 | Sicilia Street | Martin Grove Road | Castlepoint Drive | Crack Seal | \$739.87 |
| 2012 | Simmons Street | Rutherford Road | Cul-De-Sac | Crack Seal | \$2,626.36 |
| 2012 | Snider Green | Ansley Grove Road | Mathew Drive | Crack Seal | \$291.26 |
| 2012 | Southview Drive | Baldwin Avenue | Jardin Drive | Crack Seal | \$3,855.34 |
| 2012 | Spinnaker Way | Casmir Court | Cul-De-Sac | Crack Seal | \$4,973.28 |
| 2012 | Stafferin Drive | Citation Drive | Confederation Parkway | Crack Seal | \$3,228.27 |
| 2012 | Stern Gate | Discovery Trail | Ocean Avenue | Crack Seal | \$717.80 |
| 2012 | Stevenson Road | Nashville Road | Valleyview Court | Crack Seal | \$1,945.21 |
| 2012 | Strada Drive | Pine Valley Drive | Towers Road | Crack Seal | \$261,265.64 |
| 2012 | Sugarforest Drive | Maple Sugar Lane | Sassafras Circle | Crack Seal | \$463.93 |
| 2012 | Sundance Court | Royalpark Way | Cul-De-Sac | Crack Seal | \$309.08 |
| 2012 | Sungold Court | Medallion Boulevard | Cul-De-Sac | Mill And Overlay | \$66,536.08 |
| 2012 | Sylvadene Court | Sylvadene Parkway | Cul-De-Sac | Crack Seal | \$641.78 |
| 2012 | Sylvadene Parkway | Francis Street | Cul-De-Sac | Crack Seal | \$3,269.38 |
| 2012 | Sylvan Brook Avenue | Sylvadene Parkway | Cul-De-Sac | Crack Seal | \$806.99 |
| 2012 | Teahouse Road | Windflower Gate | Lento Court | Crack Seal | \$815.35 |
| 2012 | Timberview Drive | Langstaff Road | Yellowwood Circle | Crack Seal | \$1,231.50 |
| 2012 | Todd Court | Dorengate Drive | Cul-De-Sac | Crack Seal | \$467.76 |
| 2012 | Treasure Road | America Avenue | Tierra Avenue | Crack Seal | \$2,041.96 |
| 2012 | Towers Road | Rowntree Dairy Road | Whitmore Road | Crack Seal | \$302,606.26 |
| 2012 | Tumbleweed Court | Teahouse Road | Cul-De-Sac | Crack Seal | \$1,275.30 |
| 2012 | Twined Court | Cabinet Crescent | Cul-De-Sac | Mill And Overlay | \$10,700.65 |
| 2012 | Twimberry Crescent | Misty Meadow Drive | Misty Meadow Drive | Crack Seal | \$1,525.26 |
| 2012 | Ursini Court | Chamaine Road | Cul-De-Sac | Crack Seal | \$523.23 |
| 2012 | Valleyview Court | Stevenson Road | Cul-De-Sac | Crack Seal | \$1,066.56 |
| 2012 | Vaughan Mills Road | Langstaff Road | Humberview Drive | Crack Seal | \$6,120.13 |
| 2012 | Vellore Avenue | Amy Wood Road | Maria Antonia Road | Crack Seal | \$833.67 |
| 2012 | Velvet Crescent | Venetian Crescent | Venetian Crescent | Crack Seal | \$34,466.57 |
| 2012 | Venetian Crescent | Chancellor Drive | Chancellor Drive | Mill And Overlay | \$102,799.33 |
| 2012 | Vera Street | Beatrice Way | Flori Drive | Crack Seal | \$1,556.46 |
| 2012 | Via Nova Drive | Chancellor Drive | Belview Avenue | Crack Seal | \$1,223.32 |
| 2012 | Villa Park Drive | Pine Valley Drive | Cul-De-Sac | Crack Seal | \$2,719.72 |
| 2012 | Villarboit Crescent | Spinnaker Way | Rifin Lane | Crack Seal | \$3,760.06 |
| 2012 | Vita Road | Coronation Street | Jade Crescent | Mill And Overlay | \$50,123.70 |

| 2012 Pavement Management Program | | | | | |
|----------------------------------|----------------------|---------------------|-----------------------|--------------------|--------------|
| Year | Street | From | To | Treatment Name | Cost |
| 2012 | Waterfall Road | Embassy Drive | Embassy Drive | Remove And Replace | \$240,611.26 |
| 2012 | Western Skies Court | Bordeaux Drive | Cul-De-Sac | Crack Seal | \$230.32 |
| 2012 | Whiffletree Court | Villa Park Drive | Cul-De-Sac | Crack Seal | \$313.73 |
| 2012 | Whisper Lane | Nashville Road | Cul-De-Sac | Crack Seal | \$1,313.45 |
| 2012 | Whitmore Road | Rowntree Dairy Road | Highway 7 | Mill And Overlay | \$244,133.08 |
| 2012 | Wildfire Road | Turnbleweed Court | Matthew Drive | Crack Seal | \$827.98 |
| 2012 | Williamsburg Lane | Russet Way | Burgosa Court | Remove And Replace | \$77,266.67 |
| 2012 | Windflower Gate | Ansley Grove Road | Teahouse Road | Crack Seal | \$400.40 |
| 2012 | Windy Way | America Avenue | Santa Maria Trail | Crack Seal | \$399.74 |
| 2012 | Wings Road | Whitmore Road | Rowntree Dairy Road | Mill And Overlay | \$177,668.22 |
| 2012 | Woodgreen Drive | Kiloran Avenue | Cul-De-Sac | Crack Seal | \$1,728.56 |
| 2012 | Yellow Pine Crescent | Jeanne Drive | Cul-De-Sac | Crack Seal | \$1,428.73 |
| 2012 | Yellowwood Circle | Yellowwood Circle | Cul-De-Sac | Crack Seal | \$4,857.75 |
| 2012 | Zinnia Place | Martin Grove Road | Zinnia Place | Mill And Overlay | \$108,359.53 |
| 2012 | Zola Gate | Coltrane Drive | Autumn Hill Boulevard | Crack Seal | \$719.13 |
| 2012 | Zuchet Court | Chancellor Drive | Cul-De-Sac | Crack Seal | \$1,020.04 |

| 2013 Pavement Management Program | | | | | | |
|----------------------------------|----------------------|-----------------------|-----------------------|--------------------|--------------|--|
| Year | Street | From | To | Treatment Name | Cost | |
| 2013 | Adirondack Drive | Laurentian Boulevard | Foot Hills Road | Crack Seal | \$2,557.06 | |
| 2013 | Admiral Court | Vaughan Mills Road | Cul-De-Sac | Crack Seal | \$944.41 | |
| 2013 | Adrianno Crescent | Flori Drive | Flori Drive | Remove And Replace | \$376,309.24 | |
| 2013 | Afton Crescent | Barrhill Road | Sherbourne Drive | Crack Seal | \$2,045.93 | |
| 2013 | Andes Crescent | Emily Anna Street | Emily Anna Street | Crack Seal | \$2,010.02 | |
| 2013 | Angellina Avenue | Coles Avenue | Nadia Avenue | Cul-De-Sac | \$65,381.72 | |
| 2013 | Anne Court | McIntosh Crescent | Cul-De-Sac | Crack Seal | \$150.19 | |
| 2013 | Ansley Grove Road | Langstaff Road | Belview Avenue | Mill And Overlay | \$75,493.74 | |
| 2013 | Applewood Crescent | Jane Street | Edgely Boulevard | Crack Seal | \$4,859.29 | |
| 2013 | Arbourview Drive | Camden Drive | Westway Crescent | Crack Seal | \$1,086.27 | |
| 2013 | Arnold Avenue | Yonge Street | Charles Street | Crack Seal | \$3,930.00 | |
| 2013 | Arnold Avenue | Atkinson Avenue | Cul-De-Sac | Crack Seal | \$2,275.46 | |
| 2013 | Arona Road | Flori Drive | Olive Green Road | Mill And Overlay | \$29,792.88 | |
| 2013 | Arrowhead Drive | Wigwoss Drive | Wigwoss Drive | Crack Seal | \$2,386.07 | |
| 2013 | Barrhill Road | Keele Street | Foxhill Drive | Crack Seal | \$7,349.93 | |
| 2013 | Bayhampton Crescent | Judith Avenue | Judith Avenue | Crack Seal | \$2,009.34 | |
| 2013 | Beechnut Road | Kipling Avenue | Claremont Lane | Crack Seal | \$324.28 | |
| 2013 | Beechnut Road | Claremont Lane | Cul-De-Sac | Mill And Overlay | \$83,983.62 | |
| 2013 | Belair Way | Trevor Street | Maneta Street | Mill And Overlay | \$119,614.59 | |
| 2013 | Belview Avenue | Ansley Grove Road | Chancellor Drive | Mill And Overlay | \$635,361.68 | |
| 2013 | Benjamin Drive | Wigwoss Drive | Wigwoss Drive | Crack Seal | \$2,009.09 | |
| 2013 | Bevshire Circle | Spring Gate Boulevard | Spring Gate Boulevard | Crack Seal | \$1,590.57 | |
| 2013 | Birch Hill Road | Pine Ridge Avenue | Riverside Drive | Crack Seal | \$723.43 | |
| 2013 | Borrows Street | Conley Street | Conley Street | Crack Seal | \$3,079.30 | |
| 2013 | Brack Place | Swinton Crescent | Cul-De-Sac | Crack Seal | \$545.35 | |
| 2013 | Briarcliffe Crescent | Judith Avenue | Bayhampton Crescent | Crack Seal | \$1,210.02 | |
| 2013 | Brownridge Drive | Carl Tennen Street | Clark Avenue West | Mill And Overlay | \$358,222.02 | |
| 2013 | Brownstone Circle | Springfield Way | Brownstone Circle | Mill And Overlay | \$114,971.11 | |
| 2013 | Brydon Court | Cherhill Drive | Cul-De-Sac | Crack Seal | \$504.22 | |
| 2013 | Butterfield Crescent | Barrhill Road | Barrhill Road | Crack Seal | \$4,448.18 | |
| 2013 | Camden Drive | Confederation Parkway | Westway Crescent | Crack Seal | \$1,869.82 | |
| 2013 | Campbell Avenue | Spring Gate Boulevard | Atkinson Avenue | Crack Seal | \$4,191.93 | |
| 2013 | Capit Court | Roselawn Drive | Cul-De-Sac | Crack Seal | \$216.14 | |
| 2013 | Carl Tennen Street | Chelwood Drive | Centre Street | Crack Seal | \$3,047.35 | |
| 2013 | Carmen Crescent | Flori Drive | Belview Avenue | Mill And Overlay | \$90,702.72 | |
| 2013 | Centre Street | Atkinson Avenue | Bathurst Street | Crack Seal | \$4,892.81 | |
| 2013 | Chavender Place | Kipling Avenue | Cul-De-Sac | Mill And Overlay | \$46,913.45 | |
| 2013 | Checker Court | Wade Gate | Cul-De-Sac | Crack Seal | \$319.10 | |
| 2013 | Chelwood Drive | Judith Avenue | Carl Tennen Street | Crack Seal | \$1,663.31 | |
| 2013 | Chelwood Drive | Brownridge Drive | Judith Avenue | Mill And Overlay | \$47,261.96 | |
| 2013 | Cherhill Drive | Barrhill Road | Cul-De-Sac | Crack Seal | \$2,189.69 | |

| 2013 Pavement Management Program | | | | | |
|----------------------------------|-------------------------|-----------------------|-----------------------|--------------------|--------------|
| Year | Street | From | To | Treatment Name | Cost |
| 2013 | Cidermill Avenue | Jane Street | Edgeley Boulevard | Crack Seal | \$4,728.03 |
| 2013 | Claremont Lane | Beechnut Road | Tandian Court | Crack Seal | \$1,322.03 |
| 2013 | Clubhouse Road | Pine Valley Drive | Dead End | Mill And Overlay | \$83,151.99 |
| 2013 | Coles Avenue | Kipling Avenue | Cul-De-Sac | Mill And Overlay | \$63,389.19 |
| 2013 | Confederation Parkway | Westway Crescent | Ten Oaks Boulevard | Crack Seal | \$2,059.29 |
| 2013 | Conley Street | Steeles Avenue West | New Westminster Drive | Crack Seal | \$3,954.11 |
| 2013 | Courtland Avenue | Edgeley Boulevard | Cul-De-Sac | Mill And Overlay | \$55,279.99 |
| 2013 | Credlistone Road | Macintosh Boulevard | Pippin Road | Crack Seal | \$6,266.04 |
| 2013 | Credlistone Road | Pippin Road | Langstaff Road | Mill And Overlay | \$135,787.56 |
| 2013 | Crestwood Road | Hilda Avenue | Bathurst Street | Mill And Overlay | \$263,215.08 |
| 2013 | Cristina Crescent | Dante Court | Dante Court | Mill And Overlay | \$46,166.29 |
| 2013 | Croteau Crescent | Pinewood Drive | Pinewood Drive | Mill And Overlay | \$92,995.73 |
| 2013 | Dante Court | Belview Avenue | Cul-De-Sac | Mill And Overlay | \$168,935.97 |
| 2013 | Davidson Drive | Islington Avenue | Cul-De-Sac | Crack Seal | \$2,946.09 |
| 2013 | Dean Place | Stephanie Boulevard | Cul-De-Sac | Crack Seal | \$1,170.80 |
| 2013 | Deerchase Circle | Cul-De-Sac | Cul-De-Sac | Crack Seal | \$3,635.40 |
| 2013 | Derrywood Drive | Forest Run Boulevard | Ten Oaks Boulevard | Crack Seal | \$3,196.43 |
| 2013 | Dew Drop Court | Quail Run Boulevard | Cul-De-Sac | Crack Seal | \$1,184.99 |
| 2013 | Donna May Crescent | Centre Street | Cul-De-Sac | Crack Seal | \$1,130.75 |
| 2013 | Draper Boulevard | Dufferin Street | Brownridge Drive | Mill And Overlay | \$66,499.06 |
| 2013 | Dunforest Gate | Jolana Court | Deerchase Circle | Crack Seal | \$507.28 |
| 2013 | Edgeley Boulevard | Cidermill Avenue | Langstaff Road | Crack Seal | \$6,545.99 |
| 2013 | Edgeley Boulevard | Langstaff Road | Corstate Avenue | Mill And Overlay | \$285,833.58 |
| 2013 | Emerson Court | Huron Place | Cul-De-Sac | Crack Seal | \$221.29 |
| 2013 | Emily Anna Street | Maria Antonia Road | Dead End | Crack Seal | \$1,029.83 |
| 2013 | Father Ermanno Crescent | Fiori Drive | Fiori Drive | Mill And Overlay | \$109,451.30 |
| 2013 | Faye Court | Spring Gate Boulevard | Cul-De-Sac | Crack Seal | \$575.21 |
| 2013 | Fenrose Crescent | Golf Avenue | Fenrose Crescent | Mill And Overlay | \$153,402.83 |
| 2013 | Fiddler's Circle | Quail Run Boulevard | Cul-De-Sac | Crack Seal | \$492.70 |
| 2013 | Fieldcroft Court | Butterfield Crescent | Cul-De-Sac | Crack Seal | \$913.87 |
| 2013 | Fifield Drive | Fieldcroft Court | Butterfield Crescent | Crack Seal | \$2,648.98 |
| 2013 | Fiori Drive | Olive Green Road | Belview Avenue | Crack Seal | \$3,338.39 |
| 2013 | Fiori Drive | Chancellor Drive | Olive Green Road | Mill And Overlay | \$36,146.22 |
| 2013 | Firefly Crescent | Belview Avenue | Firefly Crescent | Belview Avenue | \$2,064.40 |
| 2013 | Firefly Crescent | Hayhoe Lane | Hayhoe Lane | Remove And Replace | \$687,546.41 |
| 2013 | Foot Hills Road | Kirby Road | Laurentian Boulevard | Crack Seal | \$953.11 |
| 2013 | Forecastle Road | Ten Oaks Boulevard | Derrywood Drive | Crack Seal | \$1,154.47 |
| 2013 | Forest Hill Boulevard | Ten Oaks Boulevard | Derrywood Drive | Crack Seal | \$1,413.77 |
| 2013 | Fossil Hill Road | Maria Antonia Road | Muscadell Road | Crack Seal | \$1,924.92 |
| 2013 | Foxfield Crescent | Forest Run Boulevard | Forest Run Boulevard | Crack Seal | \$3,339.25 |
| 2013 | Francine Court | Benjamin Drive | Cul-De-Sac | Crack Seal | \$180.67 |
| 2013 | Francis Street | Sylvadene Parkway | Riverview Avenue | Crack Seal | \$1,556.77 |

| 2013 Pavement Management Program | | | | | |
|----------------------------------|----------------------|-----------------------|----------------------|--------------------|--------------|
| Year | Street | From | To | Treatment Name | Cost |
| 2013 | Fredrick Street | Wigwoss Drive | Emerson Court | Crack Seal | \$1,749.16 |
| 2013 | Freemont Street | Ten Oaks Boulevard | Derrywood Drive | Crack Seal | \$1,264.43 |
| 2013 | Gamble Street | Islington Avenue | Cul-De-Sac | Crack Seal | \$1,944.89 |
| 2013 | Garview Court | Pine Valley Drive | Cul-De-Sac | Mill And Overlay | \$36,643.77 |
| 2013 | Gate House Court | Kipling Avenue | Cul-De-Sac | Crack Seal | \$919.25 |
| 2013 | Glacier Court | Laurentian Boulevard | Cul-De-Sac | Crack Seal | \$1,144.10 |
| 2013 | Glenmanor Way | Spring Gate Boulevard | Clarkhaven Street | Mill And Overlay | \$146,942.94 |
| 2013 | Glitter Road | Firefly Crescent | Belview Avenue | Crack Seal | \$811.87 |
| 2013 | Green Avenue | Clubhouse Road | Pine Valley Crescent | Crack Seal | \$4,769.16 |
| 2013 | Greenway Walk | Pine Valley Crescent | Dead End | Mill And Overlay | \$9,984.69 |
| 2013 | Gregory Gate | Golf Avenue | Cul-De-Sac | Crack Seal | \$336.99 |
| 2013 | Haley Court | Weston Road | Belview Avenue | Mill And Overlay | \$63,473.29 |
| 2013 | Hartman Avenue | Jaimie Road | Cul-De-Sac | Crack Seal | \$326.60 |
| 2013 | Havenbrook Court | Islington Avenue | Dead End | Crack Seal | \$509.92 |
| 2013 | Hayhoe Street | Brownridge Drive | Cul-De-Sac | Mill And Overlay | \$25,168.72 |
| 2013 | Honey Locust Court | Pine Grove Road | Pine Valley Drive | Crack Seal | \$2,281.92 |
| 2013 | Humbenview Drive | Rebecca Court | Cul-De-Sac | Crack Seal | \$981.38 |
| 2013 | Huntingfield Street | Vaughan Mills Road | Cul-De-Sac | Crack Seal | \$1,743.32 |
| 2013 | Huronian Place | Ten Oaks Boulevard | Forecastle Road | Crack Seal | \$1,132.75 |
| 2013 | Ida Court | Emerson Court | Cul-De-Sac | Crack Seal | \$686.82 |
| 2013 | Ivano Mews | Riverview Avenue | Cul-De-Sac | Crack Seal | \$179.53 |
| 2013 | Jaimie Road | Blaine Court | Belview Avenue | Mill And Overlay | \$27,481.02 |
| 2013 | Jaimie Road | Teagarden Court | Brownridge Drive | Crack Seal | \$861.63 |
| 2013 | Jolana Court | Brownridge Drive | Teagarden Court | Mill And Overlay | \$99,334.10 |
| 2013 | Jordan Hofer Way | Vaughan Mills Road | Cul-De-Sac | Crack Seal | \$1,396.83 |
| 2013 | Judith Avenue | Fossil Hill Road | Emily Anna Street | Crack Seal | \$1,211.88 |
| 2013 | Kanata Court | Clark Avenue West | Carl Tannen Street | Crack Seal | \$4,380.26 |
| 2013 | Karl Court | Wigwoss Drive | Cul-De-Sac | Crack Seal | \$466.52 |
| 2013 | Katerina Avenue | Oakhurst Drive | Oakhurst Drive | Crack Seal | \$624.82 |
| 2013 | Keefe Court | New Westminster Drive | Macarthur Drive | Mill And Overlay | \$102,380.21 |
| 2013 | Kingsview Drive | Wade Gate | Cul-De-Sac | Mill And Overlay | \$43,944.59 |
| 2013 | Kipling Avenue | Maria Antonia Road | Mediterra Drive | Crack Seal | \$933.63 |
| 2013 | Kipling Avenue | Meeting House Road | Chavender Place | Crack Seal | \$1,270.88 |
| 2013 | Kipling Avenue | Dead End | Veneto Drive | Loc Upgrade | \$123,866.30 |
| 2013 | Kirby Road | Veneto Drive | Highway 7 | Mill And Overlay | \$143,029.70 |
| 2013 | Kokanee Court | Dufferin Street | Ravineview Drive | Crack Seal | \$5,737.25 |
| 2013 | Langstaff Road | Laurentian Boulevard | Cul-De-Sac | Crack Seal | \$1,273.08 |
| 2013 | Langstaff Road | Dead End | Creditstone Road | Crack Seal | \$1,297.63 |
| 2013 | Laurentian Boulevard | Creditstone Road | Jane Street | Mill And Overlay | \$82,202.49 |
| 2013 | Lime Drive | Kirby Road | Cul-De-Sac | Crack Seal | \$5,595.25 |
| 2013 | Lina Maira Drive | Fiori Drive | Cul-De-Sac | Remove And Replace | \$335,351.11 |
| 2013 | | Foxfield Crescent | Foxfield Crescent | Crack Seal | \$1,001.61 |

| 2013 Pavement Management Program | | | | | |
|----------------------------------|-----------------------|-------------------------|------------------------|--------------------|--------------|
| Year | Street | From | To | Treatment Name | Cost |
| 2013 | Liskeard Circle | Carmen Crescent | Carmen Crescent | Mill And Overlay | \$49,950.42 |
| 2013 | Lloyd Street | Davidson Drive | Dead End | Crack Seal | \$900.08 |
| 2013 | Looking Glass Court | Belview Avenue | Lime Drive | Mill And Overlay | \$73,665.38 |
| 2013 | Macamo Court | Woodland Acres Crescent | Cul-De-Sac | Crack Seal | \$1,424.39 |
| 2013 | Macarthur Drive | Katerina Avenue | Cul-De-Sac | Crack Seal | \$471.69 |
| 2013 | Macarthur Drive | Beverley Glen Boulevard | Katerina Avenue | Mill And Overlay | \$69,977.73 |
| 2013 | Maika Gate | Katerina Avenue | Oakhurst Drive | Mill And Overlay | \$21,840.30 |
| 2013 | Marcus Court | Woodland Acres Crescent | Cul-De-Sac | Crack Seal | \$813.37 |
| 2013 | Marleta Street | Belair Way | Belair Way | Mill And Overlay | \$52,272.15 |
| 2013 | Marieta Street | Belview Avenue | Belair Way | Remove And Replace | \$66,720.68 |
| 2013 | Martina Crescent | Mediterra Drive | Mediterra Drive | Crack Seal | \$1,423.59 |
| 2013 | Matterhorn Road | Laurentian Boulevard | Nevada Crescent | Crack Seal | \$1,192.29 |
| 2013 | Mccabe Crescent | Conley Street | Mccabe Crescent | Crack Seal | \$1,925.58 |
| 2013 | Mcdintock Crescent | Conley Street | Conley Street | Crack Seal | \$1,823.17 |
| 2013 | Mccrackin Court | Borrowers Street | Cul-De-Sac | Crack Seal | \$158.73 |
| 2013 | Mckenzie Street | Highway 7 | Dead End | Lcb Upgrade | \$54,143.08 |
| 2013 | Meadowland Court | Golf Avenue | Cul-De-Sac | Crack Seal | \$822.14 |
| 2013 | Mediterra Drive | Fossil Hill Road | Vallere Avenue | Crack Seal | \$2,001.88 |
| 2013 | Meeting House Road | Clarence Street | Kipling Avenue | Remove And Replace | \$354,976.73 |
| 2013 | Melissa Court | Woodland Acres Crescent | Cul-De-Sac | Crack Seal | \$383.07 |
| 2013 | Millrun Crescent | Shamrock Crescent | Shamrock Crescent | Crack Seal | \$1,610.02 |
| 2013 | Millway Avenue | Pennsylvania Avenue | Langstaff Road | Crack Seal | \$6,714.30 |
| 2013 | Millwood Court | Millwood Parkway | Cul-De-Sac | Crack Seal | \$550.18 |
| 2013 | Millwood Parkway | Major Mackenzie Dr West | Cul-De-Sac | Crack Seal | \$4,997.01 |
| 2013 | Miriam Garden Way | Katerina Avenue | Oakhurst Drive | Crack Seal | \$552.79 |
| 2013 | Moccasin Trail | Wigwoss Drive | Cul-De-Sac | Crack Seal | \$953.41 |
| 2013 | Mountbatten Road | Tova Place | Westmount Boulevard | Crack Seal | \$2,583.39 |
| 2013 | Mounfield Crescent | Brownridge Drive | Brownridge Drive | Mill And Overlay | \$63,666.50 |
| 2013 | Nada Crescent | Trevor Street | Trevor Street | Crack Seal | \$1,826.85 |
| 2013 | Nadia Avenue | Kipling Avenue | Angelina Avenue | Mill And Overlay | \$56,231.21 |
| 2013 | Nattress Street | Riverside Drive | Pine Ridge Avenue | Mill And Overlay | \$33,683.80 |
| 2013 | Nevada Crescent | Laurentian Boulevard | Laurentian Boulevard | Crack Seal | \$3,520.89 |
| 2013 | New Westminster Drive | Steeles Avenue West | Joseph Aaron Boulevard | Mill And Overlay | \$240,064.93 |
| 2013 | Niktas Court | Dead End | Rebecca Court | Crack Seal | \$429.21 |
| 2013 | Nimacor Avenue | Courtland Avenue | Romina Drive | Mill And Overlay | \$56,862.67 |
| 2013 | Norglen Road | Belview Avenue | Dante Court | Mill And Overlay | \$31,166.79 |
| 2013 | Norton Place | Meeting House Road | Cul-De-Sac | Remove And Replace | \$34,918.37 |
| 2013 | Oakhurst Drive | Beverley Glen Boulevard | Edenbridge Drive | Crack Seal | \$420.98 |
| 2013 | Oakhurst Drive | Edenbridge Drive | Karl Court | Mill And Overlay | \$99,521.28 |
| 2013 | Olive Green Road | Chancellor Drive | Flort Drive | Mill And Overlay | \$66,871.94 |
| 2013 | Pamela Court | Woodland Acres Crescent | Cul-De-Sac | Crack Seal | \$722.64 |
| 2013 | Parsons Place | Valentine Place | Cul-De-Sac | Crack Seal | \$665.15 |

| 2013 Pavement Management Program | | | | | |
|----------------------------------|-----------------------|-------------------------|--------------------|--------------------|--------------|
| Year | Street | From | To | Treatment Name | Cost |
| 2013 | Patrice Crescent | Campbell Avenue | Campbell Avenue | Crack Seal | \$1,723.33 |
| 2013 | Pentland Crescent | Empress Road | Greenock Drive | Crack Seal | \$2,370.17 |
| 2013 | Petermar Drive | Millwood Parkway | Millwood Parkway | Crack Seal | \$3,014.12 |
| 2013 | Pikington Crescent | Chelwood Drive | Judith Avenue | Mill And Overlay | \$43,026.09 |
| 2013 | Pine Grove Road | Pine Valley Drive | Islington Avenue | Crack Seal | \$4,002.31 |
| 2013 | Pine Ridge Avenue | Nattress Street | Woodview Road | Crack Seal | \$1,036.14 |
| 2013 | Pine Valley Crescent | Clubhouse Road | Cul-De-Sac | Mill And Overlay | \$161,523.41 |
| 2013 | Pinewood Drive | Hilda Avenue | Cul-De-Sac | Mill And Overlay | \$130,600.39 |
| 2013 | Pippin Road | Jane Street | Credistone Road | Crack Seal | \$4,930.32 |
| 2013 | Quail Run Boulevard | Teston Road | Cul-De-Sac | Crack Seal | \$6,337.91 |
| 2013 | Queensbridge Drive | Confederation Parkway | Westway Crescent | Crack Seal | \$1,749.69 |
| 2013 | Rachelle Court | Stephanie Boulevard | Cul-De-Sac | Crack Seal | \$1,370.80 |
| 2013 | Rebecca Court | Woodland Acres Crescent | Honey Locust Court | Crack Seal | \$3,213.62 |
| 2013 | Rejane Crescent | Campbell Avenue | Campbell Avenue | Crack Seal | \$1,756.03 |
| 2013 | Richbell Street | Wade Gate | Brownridge Drive | Mill And Overlay | \$87,341.91 |
| 2013 | Riverside Drive | Nattress Street | Woodview Road | Crack Seal | \$1,286.19 |
| 2013 | Riverside Drive | Willis Road | Nattress Street | Mill And Overlay | \$39,374.87 |
| 2013 | Riverview Avenue | Emerson Court | Jules Avenue | Crack Seal | \$3,273.09 |
| 2013 | Rodeo Drive | Atkinson Avenue | Cul-De-Sac | Crack Seal | \$2,519.27 |
| 2013 | Romina Drive | Edgley Boulevard | Corstate Avenue | Mill And Overlay | \$225,587.32 |
| 2013 | Rondeen Road | Derrywood Drive | Ten Oaks Boulevard | Crack Seal | \$944.98 |
| 2013 | Rosebury Lane | Clarence Street | Meeting House Road | Remove And Replace | \$331,020.10 |
| 2013 | Rosewood Court | Rosebury Lane | Cul-De-Sac | Remove And Replace | \$42,184.34 |
| 2013 | Samuel Oster Avenue | Chelwood Drive | Judith Avenue | Mill And Overlay | \$59,742.80 |
| 2013 | Sara Street | Tasha Court | Angelina Avenue | Mill And Overlay | \$31,981.96 |
| 2013 | Shallmar Place | Pentland Crescent | Cul-De-Sac | Crack Seal | \$552.35 |
| 2013 | Shamrock Crescent | Roselawn Drive | Roselawn Drive | Crack Seal | \$2,377.01 |
| 2013 | Silver Fox Place | Woodland Acres Crescent | Cul-De-Sac | Crack Seal | \$1,155.35 |
| 2013 | Snidercroft Road | Keele Street | Cul-De-Sac | Crack Seal | \$4,632.71 |
| 2013 | Snow Boulevard | Talman Court | Pippin Road | Crack Seal | \$4,763.79 |
| 2013 | Southlawn Drive | Capri Court | Vaughan Mills Road | Crack Seal | \$1,939.32 |
| 2013 | Spring Garden Gate | Vaughan Mills Road | Deerchase Circle | Crack Seal | \$518.40 |
| 2013 | Spring Gate Boulevard | Atkinson Avenue | Thornbury Circle | Crack Seal | \$2,325.34 |
| 2013 | Spring Gate Boulevard | Cul-De-Sac | Charles Street | Mill And Overlay | \$119,815.84 |
| 2013 | Stan Gate | Langstaff Road | Belview Avenue | Mill And Overlay | \$61,133.56 |
| 2013 | Steeves Court | Mccintock Crescent | Cul-De-Sac | Crack Seal | \$117.81 |
| 2013 | Stephanie Boulevard | Kirby Road | Kirby Road | Crack Seal | \$6,622.24 |
| 2013 | Sugarbush Court | Greenway Walk | Cul-De-Sac | Crack Seal | \$622.90 |
| 2013 | Sundown Court | Swinton Crescent | Cul-De-Sac | Crack Seal | \$303.80 |
| 2013 | Sunnyview Street | Westway Crescent | Westway Crescent | Crack Seal | \$1,243.96 |
| 2013 | Swinton Crescent | Borrow Street | Borrow Street | Crack Seal | \$2,019.70 |
| 2013 | Sylvadene Parkway | Fredrick Street | Francis Street | Crack Seal | \$497.50 |

| 2013 Pavement Management Program | | | | | | |
|----------------------------------|--------------------------|----------------------------|-------------------------|------------------|--------------|--|
| Year | Street | From | To | Treatment Name | Cost | |
| 2013 | Tandian Court | Langstaff Road | Cul-De-Sac | Crack Seal | \$767.32 | |
| 2013 | Tangreen Circle | Spring Gate Boulevard | Spring Gate Boulevard | Crack Seal | \$1,641.22 | |
| 2013 | Tanjo Court | Springfield Way | Cul-De-Sac | Mill And Overlay | \$36,723.32 | |
| 2013 | Tasha Court | Nadia Avenue | Cul-De-Sac | Mill And Overlay | \$37,173.66 | |
| 2013 | Teagarden Court | Jaimie Road | Cul-De-Sac | Mill And Overlay | \$12,914.30 | |
| 2013 | Thomson Creek Boulevard | Roselawn Drive | Vaughan Mills Road | Crack Seal | \$1,718.88 | |
| 2013 | Thornbury Circle | Spring Gate Boulevard | Spring Gate Boulevard | Crack Seal | \$1,451.00 | |
| 2013 | Tinti Place | Campbell Avenue | Cul-De-Sac | Crack Seal | \$405.79 | |
| 2013 | Trevor Street | Belview Avenue | Belair Way | Crack Seal | \$1,361.06 | |
| 2013 | Valentine Place | Carl Tennen Street | Cul-De-Sac | Crack Seal | \$275.70 | |
| 2013 | Vas Road | Vellore Avenue | Medterra Drive | Crack Seal | \$911.80 | |
| 2013 | Vaughan Mills Road | Humberview Drive | Thomson Creek Boulevard | Crack Seal | \$5,562.63 | |
| 2013 | Vellore Avenue | Maria Antonia Road | Dead End | Crack Seal | \$1,927.37 | |
| 2013 | Vroom Court | Riverview Avenue | Cul-De-Sac | Crack Seal | \$515.91 | |
| 2013 | Wade Gate | Centre Street | Brownridge Drive | Mill And Overlay | \$138,714.93 | |
| 2013 | Wakelin Court | Islington Avenue | Cul-De-Sac | Crack Seal | \$1,379.99 | |
| 2013 | Wallace Street | Highway 7 | Cul-De-Sac | Lot Upgrade | \$32,925.03 | |
| 2013 | Waymar Heights Boulevard | Davidson Drive | Gamble Street | Crack Seal | \$2,368.85 | |
| 2013 | Westcroft Avenue | Brownridge Drive | Judith Avenue | Crack Seal | \$414.88 | |
| 2013 | Westway Crescent | Camden Drive | Confederation Parkway | Crack Seal | \$4,944.42 | |
| 2013 | White Boulevard | Draper Boulevard | Draper Boulevard | Mill And Overlay | \$104,257.36 | |
| 2013 | Wigwoss Court | Wigwoss Drive | Cul-De-Sac | Crack Seal | \$248.96 | |
| 2013 | Wigwoss Drive | Highway 7 | Arrowhead Drive | Crack Seal | \$5,364.29 | |
| 2013 | Willis Road | Pine Valley Drive | Islington Avenue | Mill And Overlay | \$183,775.74 | |
| 2013 | Wood Dale Road | Camden Drive | Westway Crescent | Crack Seal | \$903.62 | |
| 2013 | Woodland Place | Major Mackenzie Drive West | None | Crack Seal | \$1,037.46 | |
| 2013 | Woodland Acres Crescent | Bathurst Street | Bathurst Street | Crack Seal | \$13,700.50 | |
| 2013 | Woodview Road | Riverside Drive | Riverside Drive | Crack Seal | \$786.67 | |

ATTACHMENT NO. 3

CITY OF VAUGHAN

EXTRACT FROM COUNCIL MEETING MINUTES OF APRIL 2, 2007

Item 1, Report No. 14, of the Committee of the Whole (Working Session), which was adopted without amendment by the Council of the City of Vaughan on April 2, 2007.

1 5 YEAR PAVEMENT MANAGEMENT PROGRAM

The Committee of the Whole (Working Session) recommends:

- 1) That the recommendation contained in the following report of the Commissioner of Engineering and Public Works, dated March 20, 2007, be approved; and
- 2) That the presentation by the Supervisor, Infrastructure Management, and presentation material submitted entitled, "5-Year Pavement Management Program", be received.

Recommendation

The Commissioner of Engineering and Public Works in consultation with the Commissioner of Finance and Corporate Services recommends:

1. That the proposed 5 Year Pavement Management Program be approved; and
2. That the Commissioner of Engineering and Public Works be authorized to engage external professional services for the preliminary engineering and design of the projects proposed in the 5 Year Pavement Management Program upon approval of the 2007 Capital Budget Item EN-1655-07 Pre-Engineering Pavement Management Program.

Economic Impact

The 5 Year Pavement Management Program will require an investment of \$46,732,600 (excluding interest). The capital component of \$45,752,600 compares to the \$45,000,000 (excluding interest) which would be required over the next 5 years under the previous Roads Program. Capital Funding is provided through the issuance of debentures while maintenance related costs are funded through the Operating Budget. The issuance of the long term debt will have an estimated interest cost of \$13,500,000 when the projects are complete.

The requirement per annum is broken down as follows:

| Year | Long Term Debenture (LTD) Amount | Annual Principal & Interest On Issue | Annual Maintenance | Total Operating Budget Impact | Annual Impact of Tax Rate (r=1,014,037) | Cumulative Operating Budget Impact |
|-------|---|---|-----------------------|-------------------------------------|---|--|
| 07 | \$10,815,000 | \$1,400,592 | \$200,000 | \$1,600,592 | 1.58% | 1.58% |
| 08 | \$6,592,000 | \$853,694 | \$240,000 | \$1,093,694 | 1.08% | 2.66% |
| 09 | \$9,064,000 | \$1,173,830 | \$240,000 | \$1,413,830 | 1.39% | 4.05% |
| 10 | \$9,084,600 | \$1,176,497 | \$160,000 | \$1,336,497 | 1.32% | 5.37% |
| 11 | \$10,197,000 | \$1,320,558 | \$140,000 | \$1,460,558 | 1.44% | 6.81% |
| Total | \$45,752,600 | \$5,925,171 | \$980,000 | \$6,905,171 | | |

The cumulative annual impact after year 5 of the 5 Year Payment Management Program to the operating budget as a result of issuing debentures in the amount of \$45,752,600 and funding the \$980,000 5 year maintenance program is \$6,905,171 or 6.81% on the tax rate. The payments will continue over the term of the debentures which has been typically 10 years.

The Long Term optimization of resources can be achieved through City initiatives such as the Pavement Management System. Modeling these figures within the Long Range Financial

CITY OF VAUGHAN

EXTRACT FROM COUNCIL MEETING MINUTES OF APRIL 2, 2007

Item 1. CW(WS) Report No. 14 – Page 2

Planning Model so that future funding implications are known and can be planned for at the earliest possible point in time will allow for budgetary and/or program changes to be considered accordingly.

It should be noted that 2007 to 2008 is a transition year in implementing the 5 Year Pavement Management Program. The 2007 program reflects the older Road Reconstruction, Road Resurfacing and Rural Road Upgrade combined programs based on a 'worst first', Road Needs methodology. The 2008 and beyond program reflects a life cycle triggered and greatest-return-on dollar invested methodology. The increased dollar figures for the 2007 year reflect updated project benchmark estimates using unit rates developed in the Pavement Management System.

Communications Plan

There has not been public consultation to this point. Implementation of individual projects would be subject of the Engineering Services Department standard communication with affected residents prior to and during construction.

Purpose

The purpose of this report is to obtain Council approval of the 5 Year Pavement Management Program, Project Level Program requirements based on the Level Of Service to maintain an overall average road network rating being a Pavement Composite Index (PCI) of 70 out of 100 (possible points) and communicate the associated funding requirements.

Background - Analysis and Options

Pavement Management System Project Initiation

On December 6, 2004, Council approved the contract award for the Pavement Management System project. The purpose of a Pavement Management System (PMS) is to assist City staff in the coordination, planning and implementation of its roadway maintenance, rehabilitation and construction programs.

Traditional Roads Program Methodology

On June 27, 2005, Council endorsed in principle, Road Resurfacing, Road Reconstruction and Rural Roads Upgrading Programs for 2006.

Annually, staff brings forward a report to seek Council endorsement of the proposed 5 Year Roads Program and authorization to employ external professional engineering services for the preliminary engineering and detailed design of these proposed construction projects.

The adoption of this program was to deal with the increasing backlog of deteriorating roads and to provide Council with a comprehensive plan for road upgrading across the City. These programs (Road Resurfacing, Road Reconstruction and Rural Road Upgrading) were prepared on a 'worst first' basis and road sections are evaluated utilizing factors such as traffic volumes and condition rating of the road facility. Consideration was also given to other factors such as roads in the same vicinity that are also deficient and that were constructed in the same era as well as needs identified regarding the condition of existing underground services such as sewers and watermains.

This last report advised Council that a new program would be coming forward with the implementation of a Pavement Management System.

CITY OF VAUGHAN

EXTRACT FROM COUNCIL MEETING MINUTES OF APRIL 2, 2007

Item 1. CW(WS) Report No. 14 – Page 3

New Asset Management Methodology

On February 16, 2006, Council endorsed through resolution, InfraGuide and the best practices with respect to Asset Management. Through InfraGuide, a comprehensive business strategy involves three pillars: People, Information and Technology.

The Essential Elements of an Asset Management Plan are:

1. *What do you have and where is it?*
2. *What is it worth?*
3. *What is its condition and its expected service life?*
4. *What is the level of service expectation, what needs to be done?*
5. *When do you need to do it?*
6. *How much will it cost and what is the acceptable level of risk?*
7. *How do you ensure long term affordability?*

People, Information and Technology in practice with the Essential Elements is the key to a successful implementation of an Asset Management Plan.

It is within this framework that the 5 Year Pavement Management Program is being reported.

Pre-Engineering

The Engineering Services Department completes design and tender documents for Capital construction projects annually at the earliest possible time. Having early tenders produces savings to the City through lower unit rates from bidders and earlier project start and finish dates, resulting in reduced impact to citizens and the environment.

Engineering Services has traditionally worked on Pre-Engineering for various projects one year in advance of their proposed construction year. This methodology becomes restrictive when the annual budget approval process goes beyond February of the current calendar year.

Staff seek Council's approval of Pre-Engineering beyond the traditional 1 year window to a multi-year window. This will allow the City to have completed design and tender documents "on the shelf" for multiple projects, in multiple years ready for bidding. With projects in this state, the City can go out to tender at the earliest possible time and take advantage of lower rates and favourable construction timing.

5 Year Pavement Management Program

The Infrastructure Management Division of the Engineering Services Department is responsible for infrastructure records, engineering related data and data management and strategic analysis related to the City's civil infrastructure. The Division maintains road related data and undertakes the condition assessment of the City's roads annually in partnership with the Design Services Division and the Public Works Department.

The base data required for the Pavement Management System is generated as a regular function of the Infrastructure Management Division and is fully integrated with the Enterprise G.I.S. Database.

1. What do you have and where is it?

The inventory of City owned active roads are summarized in the following table by Ward, Surface Material Type.

CITY OF VAUGHAN

EXTRACT FROM COUNCIL MEETING MINUTES OF APRIL 2, 2007

Item 1, CW(WS) Report No. 14 – Page 4

Table No. 1

| Summary of Road Network - By Ward and Surface Material | | | |
|--|------------------|----------------|-----------------|
| Ward | Surface Material | Total C/L (km) | Total Lane (km) |
| 1 | Gravel / Stone | 24.23 | 48.46 |
| | Asphalt | 235.48 | 503.46 |
| | Surface Treated | 28.61 | 57.21 |
| 2 | Gravel / Stone | 8.50 | 17.00 |
| | Asphalt | 153.27 | 347.89 |
| | Surface Treated | 6.25 | 12.50 |
| 3 | Asphalt | 101.25 | 258.83 |
| 4 | Asphalt | 178.12 | 449.81 |
| 5 | Asphalt | 74.63 | 174.99 |
| | Surface Treated | 3.27 | 6.53 |
| Total | | 813.61 | 1876.68 |

2. What is it worth?

Based on the Reconstruction unit rate used in the Pavement Management System, staff have estimated the replacement value of the City's entire road network to be approximately **\$1.8 BILLION DOLLARS**. This figure does not include the value for underground servicing such as water and wastewater systems nor boulevard amenities such as sidewalk or street lighting.

3. What is its condition and its expected service life?

The condition of a road is determined through a combination of field inspection and review of various analytical factors. Individual ratings and indices are combined into an overall index called a **Pavement Composite Index (PCI)** with an ascending range of 0 (worst) to 100 (best). This index is comprised of 3 major subsections being:

| | |
|----------------------|--|
| Health | The condition of a road which includes surface ride comfort, structural distresses and its ability to properly drain water away from the road's structural components; |
| Capacity | The current, measured traffic volume (Annual Average Daily Traffic) as compared to the theoretical capacity of a road; |
| Physical Environment | The remaining considerations surrounding the behavior of a road including skid resistance, safety and geometry. |

A complete definition and description of the Pavement Composite Index is included in Attachment No. 1.

According to the Pavement Management System, our current average network condition for all City roads has a PCI of 86.7 out of 100 possible points. This differs from an average of 86.2 out of 100 previously reported which reflects an update to road condition to the network based on work done in 2006.

Our current average network condition distribution for all City roads is summarized in the following table:

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EXTRACT FROM COUNCIL MEETING MINUTES OF APRIL 2, 2007

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Table No. 2

| Pavement Management System Grouping | Value Range | Network Distribution |
|-------------------------------------|-------------|----------------------|
| Excellent | 80 to 100 | 81.6% |
| Good | 60 to 80 | 15.8% |
| Fair | 35 to 60 | 2.6% |
| Poor | 20 to 35 | 0% |
| Very poor | 0 to 20 | 0% |

4. What is the level of service expectation, what needs to be done?, and
5. When do you need to do it?

Setting a **Level of Service (LOS)** or a target, is an important and critical step in a proper Asset Management Plan. From Item 1, Report No. 28 of the Committee of the Whole (Working Session) on May 23, 2006, Council set a Level Of Service to maintain an overall average road network rating being a **Pavement Composite Index (PCI) of 70 out of 100** (possible points).

Applicable treatments that fall within Capital and Operations and Maintenance Budget categories are as follows:

| Budget Type | Treatment Name |
|-------------|-------------------------|
| Operating | Crack Seal |
| Operating | Drainage Treatment |
| Capital | Complete Reconstruction |
| Capital | Gravel To HCB |
| Capital | Gravel To LCB |
| Capital | LCB Surface Treatment |
| Capital | LCB Upgrade To HCB |
| Capital | Micro Surface |
| Capital | Mill And Overlay |
| Capital | Pulverize And Overlay |
| Capital | Remove And Replace |

Attachment No. 2 includes a detailed Project Level Program This list is sorted by the following criteria:

- Year
- Treatment Name
- Street Name
- Street From
- Street To

Please note that the Pavement Management Program reflects a shift to more preventative and rehabilitative methods of intervening strategies in the lifecycle of a road such as Crack Sealing, Micro Surfacing and Mill and Overlay. This philosophy will provide the City with its greatest return on every dollar invested to maximize the life of our road asset.

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6. How much will it cost and what is the acceptable level of risk?

Based on the target Level of Service, investment required over the next 5 years are as follows:

| Year | Capital Budget | Operating Budget |
|-------------|-----------------------|-------------------------|
| 2007 | \$10,815,000.00 | \$200,000.00 |
| 2008 | \$6,592,000.00 | \$240,000.00 |
| 2009 | \$9,064,000.00 | \$240,000.00 |
| 2010 | \$9,084,600.00 | \$160,000.00 |
| 2011 | \$10,197,000.00 | \$140,000.00 |

Ongoing discussions take place with staff of our Public Works Department regarding the conditions of existing underground services such as storm and sanitary sewers and watermains. If there is also a potential need to perform substantial repairs or replacement of underground services in the near future, then the road need in those locations will be aligned to remedy both deficiencies at the same time.

7. How do you ensure long term affordability?

As the City's road infrastructure, information, systems and technology matures, multi-faceted integration across all asset classes such as roads, structures, pipes and amenities will be realized. This is a natural path not only from an engineering technical analysis but should also be embraced from a financial perspective.

We must acknowledge that activities such as Crack Sealing and Drainage Treatment directly affect the lifecycle of a road. Future funding requirements will shift year to year between preventative and rehabilitative types of intervention such as Crack Sealing and Mill and Overlay.

Ensuring that the funding requirements are captured in the long range financial planning model and that any increases to proposed funding requirements are supported, will ensure that the road network is maintained at our target Level of Service.

Meeting the target level of service is critical to maximize the benefit for every dollar we invest in road rehabilitation which will directly reduce costly future road reconstruction. Should current and future funding levels not be supported, we risk further deterioration of roads, a reduced level of serviceability and increase long term maintenance costs for our road system, without the opportunity to achieve sustainability.

Regional Implications

There are no Regional implications.

Relationship to Vaughan Vision 2007

This report is consistent with the priorities previously set by Council.

Service Delivery Excellence

We are able to develop and establish service level standards that are sustainable and provide effective and efficient delivery of service.

Manage our Resources

The City has a significant investment in infrastructure that requires a process and a plan to ensure that its repair and eventual replacement is properly managed.

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Communications and Public Relations

Through endorsement of the InfraGuide Best Practices, we strengthen Corporate Image and identity.

Technology and Innovation

The system conforms with the policies, standards and procedures as defined through the Corporate G.I.S. Initiative. The 5 Year Pavement Management Program achieves the Corporate Strategic Plan to develop and implement an Infrastructure Management System to enhance safety through proactive repair and replacement and improve financial efficiency and return on investment through life cycle costing.

Conclusion

The purpose of this report is to obtain Council approval of the 5 Year Pavement Management Program, Project Level Program requirements which meets the Level Of Service to maintain an overall average road network rating being a Pavement Composite Index (PCI) of 70 out of 100 (possible points) and to communicate the associated funding requirements.

Attachments

1. Attachment No. 1 - Summary of Terms
2. Attachment No. 2 – 2007 to 2011 Pavement Management Program

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(A copy of the attachments referred to in the foregoing have been forwarded to each Member of Council and a copy thereof is also on file in the office of the City Clerk.)