OFFICE OF THE
City Auditor

# Parks Branch Audit

May 18, 2010

THE CITY OF Edmonton

The Office of the City Auditor conducted this project in accordance with the *International Standards for the Professional Practice of Internal Auditing*

# Parks Branch Audit
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# Parks Branch Audit

## Executive Summary

Edmonton's parks, trails, river valley and natural areas are important assets to the City of Edmonton. As one of four branches within the Asset Management and Public Works Department, the Parks Branch is responsible for the acquisition, construction, preservation and maintenance of City parks, the river valley and natural areas.

This value for money audit assessed whether selected areas of the Parks program operate efficiently, effectively, and economically and whether risks are managed to an acceptable level.

Our audit objectives focused on reviewing the use of resources in managing the City's urban forest and reviewing the use of resources in the delivery of capital construction projects.

**Management of the Urban Forest**

In our assessment of the management of the City's urban forest, we reviewed three activities including tree pruning, tree planting, and pest management. We learned that the City's urban forest is currently challenged by ongoing drought conditions and recent wind storms. The Parks Branch has completed an inventory of trees and a tree health assessment in order to monitor this risk to the urban forest.

Tree pruning is necessary to maintain trees' appearance and structure, public safety, and minimize the potential for tree pest and disease infestation. We reviewed tree pruning activities and observed that in 2009, 48% of planned tree pruning work was assigned to contract staff and 52% was assigned to in-house staff. Tree pruning work assigned to contract staff was completed as planned, however, tree pruning work assigned to in-house staff was not completed as planned and these resources were shifted to other activities such as tree and stump removal, contract watering, and tree planting in response to storm damage and tree losses. Overall, we believe this shifting of resources away from tree pruning may have a negative long-term impact on the health of the urban forest.

We compared the unit costs of contract tree pruning to that of in-house tree pruning and found that costs were comparable. Tree pruning activities that were completed appear to be performed in a cost efficient manner but the Parks Branch did not complete the tree pruning volumes as planned and budgeted. Based on these observations we have recommended that the Parks Manager review and reallocate tree pruning resources accordingly.

We reviewed tree planting activity and observed that in-house unit costs were much lower than contracted tree planting costs. For example, in 2009 in-house direct tree

planting costs were $743 per tree compared to contracted costs of $1,136 per tree. We also reviewed the three-year capital project for the replacement of drought damaged trees and observed that significantly fewer trees were replaced (3,009 trees) than originally planned (6,300 trees). We estimated that the City could have replaced the same number of trees for $2.2 million compared to the $3.5 million paid to the contractor under this capital project. We have recommended that the Parks Branch conduct a formal review of its current tendering practices.

We observed a high level of risk awareness of current and emerging risks in the Pest Management area and that they have taken proactive steps to managing risks to the urban forest. Pest Management is highly engaged internally within the Parks Branch and also with numerous outside organizations in the detection and monitoring of risks to the urban forest.

**Delivery of Capital Projects**

In our assessment of the delivery of capital construction projects we reviewed the capital budget planning process, planned and actual capital expenditures, and a sample of capital projects.

We observed that the planned Parks capital budget has grown exponentially since 2005 and also observed that the actual capital spending is significantly below planned levels from 2006 to 2009. We also observed that several capital profiles are lacking in detailed information and we have recommended that the Parks Branch strengthen their capital planning process in the interests of greater transparency and accountability.

We reviewed the project files of four capital profiles and observed that these projects met the requirements of the City's administrative directive on project management. However, we also observed that current management information reports did not serve staff well in their need to manage projects and that work-around systems have been developed to meet their needs. We have recommended that the Parks Branch identify and produce a limited number of key project costing reports and that all required users receive sufficient training.

We observed a blending of roles within the capital project area between Project Managers and Project Leads which we believe increases the financial risk of projects. Additionally, we observed that the work load between staff within the project management area appears unbalanced as exhibited by excessive overtime of some staff and relatively little by others. We have recommended that the Parks Branch review the current workload distribution within its capital program area.

# Parks Branch Audit

## 1. Introduction

Edmonton's parks, trails, river valley and natural areas are important assets to the City of Edmonton. This value for money audit assessed whether the selected areas of the Parks program operate efficiently, effectively, and economically and whether risks are managed in an acceptable manner. The Parks Branch Audit was approved by City Council as part of the 2010 Office of the City Auditor's (OCA) annual plan.

## 2. Background

### 2.1. Parks Branch Overview

The Parks Branch is responsible for the development, preservation and ongoing maintenance of civic grounds (parks, boulevards, school sites, natural areas, roadway landscapes, and utility corridors). The 2010 Parks inventory lists 13,318 hectares of parks and open spaces which consists of 821 parks, 342 playgrounds, 1,780 sports fields, 161 kilometers of trails, and 279,000 trees along boulevards and in parks[1]. The Parks Branch 2010 approved operating tax levy budget is $44.4 million with a staff complement of 542.1 full-time equivalent positions (FTE's). In 2010 there is $63.4 million in planned capital budget expenditures for development and preservation of City parks.

Guiding the future acquisition, construction, preservation and maintenance of City Parks, river valley, and natural areas is the Urban Parks Management Plan 2006-2016. This ten-year corporate plan defines the strategic vision for the City's Parks system and the guiding principles necessary to achieve the vision which is stated as follows:

> *"Edmonton's parks, trails, river valley and natural areas connect Edmontonians to their community, to the environment and to one another. Open spaces provide year-round recreation, relaxation, natural beauty and ecological integrity to Alberta's capital city. Edmonton's parks breathe life and sustainability into a vibrant urban environment."*

The Parks Branch maintains a three-year business plan which identifies numerous strategic initiatives aimed at achieving the strategic vision of the Urban Parks Management Plan and addressing emerging issues.

**Branch Functions**

[1] Trees in natural areas are not inventoried therefore the total number of trees for the entire urban forest is unknown.

Within the Parks Branch there are two main functional areas:

- **Parks Development and Preservation** – responsible for parkland planning and assembly, open space design, development, and construction and the preservation of natural areas. This area works to ensure land is appropriately set aside for parks and open spaces and that lands are developed to meet the needs of citizens. An additional key focus is to work with partners to protect, restore and manage the ecological network within the City region.

- **Parks Management and Operations –** responsible for ongoing operation and maintenance of turf, flowers and shrubs (horticulture), sports fields and playgrounds on all civic parks, boulevards, school sites, natural areas. Winter maintenance activities include snow removal, grooming of ski trails, and outdoor ice maintenance. This area is additionally responsible for preserving the urban forest, coordination of the volunteer spring clean-up, and park ranger services. Also specialty expertise is provided on pest management and laboratory services, horticulture, and forestry.

## 2.2. Parks Financial Resources and Performance

### 2.2.1. Parks Branch Operating Budget

Table 1 illustrates the historical and planned operating budget resources for each of the major service areas described previously and includes a Branch summary.

Table 1 – Parks Branch Net Operating Budget – Years 2006-2010 ($ millions)

| | 2006 Budget | 2007 Budget | 2008 Budget | 2009 Budget | 2010 Budget |
|---|---|---|---|---|---|
| **Development and Preservation** | | | | | |
| Net Operating Budget | $4.4 | $4.6 | $8.4 | $6.2 | $6.5 |
| Full-time Equivalent Positions | 83.5 | 87.5 | 97.2 | 106.1 | 110.5 |
| **Management and Operations** | | | | | |
| Net Operating Budget | $28.8 | $32.8 | $35.4 | $37.6 | $37.9 |
| Full-time Equivalent Positions | 293.2 | 324.4 | 420.4 | 435.2 | 431.6 |
| **Branch Summary** | | | | | |
| Net Operating Budget | $33.2 | $37.4 | $43.8 | $43.8 | $44.4 |
| Full-time Equivalent (FTE) Positions | 376.7 | 411.9 | 517.6 | 541.3 | 542.1 |

In 2008, the total number of identified Branch FTE's was increased by 87.5 FTE's to align with approved personnel budgets during the Park's Branch transition from the Community Services Department to the Asset Management & Public Works Department. All additional increases in FTE's are due to inventory growth and transfer of positions from other areas such as Natural Areas in 2008.

The net operating budget for the Development and Preservation area has increased from $4.4 million in 2006 to $6.5 million in 2010 which represents a 48% increase. The net operating budget for the Management and Operations area has increased from $28.8 million in 2006 to $37.9 million in 2010 which represents a 32% increase. Overall, from 2006 to 2010, the Parks Branch net operating budget increased by $11.2 million

(34% increase) which is partly attributed to the absorption of other business areas such as Natural Areas and Resource Management into the Parks Branch. Similarly, during this same period from 2006 to 2010 the City's net operating budget increased from $1,310 million to $1,701 million which represents a 30% increase.

### 2.2.2. Parks Capital Budget

Table 2 illustrates the planned capital budget resources used in the development and preservation of City parks.

Table 2 – Parks Branch Capital Budget – Years 2006-2011 ($ millions)

| | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 |
|---|---|---|---|---|---|---|
| Total Parks Capital Budget | $35.5 | $47.8 | $75.4 | $64.7 | $63.4 | $49.6 |

Figures from 2006 to 2009 reflect approved budgets which have then been adjusted for year to year budget carry-forwards and supplemental budget adjustments. Figures for 2010 and 2011 are from the 2009-2013 Capital Priorities Plan.

The Parks capital budget peaked in 2008 at $75.4 million after several years of increases. In 2009, planned capital budget expenditures declined and is expected to decline further in 2010 and 2011.

### 2.2.3. Parks Branch Performance Data

Table 3 illustrates the 2009 key performance data available for the Parks Branch based on 2008 inventory levels.

Table 3 – 2009 Parks Branch Performance Data

| Activity | Inventory | Service Level |
|---|---|---|
| Turf Maintenance | 4,418 hectares | 2 to 18 times per year |
| Horticulture<br>• Flower Beds<br>• Container Planters<br>• Shrub Beds | <br>9,160 sq. m<br>1,934 sq. m.<br>1,229,596 sq. m. | <br>11 times per year<br>11 times per year<br>5 times per year (major parks and downtown)<br>2 times per year (district parks and roadway buffers) |
| Playgrounds | 342 playgrounds | Inspected every 11 days during summer, monthly in winter |
| Urban Forest Management | 279,000 trees | 45,370 trees pruned<br>1,376 trees planted (operating budget resources only) |
| Pest Management<br>• Aerial Spraying<br>• Tree Pest Control | <br>18,350 hectares of mosquito spraying<br>279,000 trees | <br>14.5 hectares per day<br>61 trees per day/per 2-man crew |
| Parks Servicing | 10 Parks Rangers | 18 hrs per day / 365 days |
| Snow Removal | 824,099 sq. m. | 11,520 sq. m. per crew/day |

Source: 2010 Parks Branch Budget documentation

# 3. Objectives, Scope and Methodology

## 3.1. Audit Objectives

Audit objectives represent the project goals of the overall audit. There were two audit objectives defined for this audit which are as follows:

1) Assess whether resources are used efficiently and effectively in the management of the City's Urban Forest.
2) Assess whether resources are being used efficiently and effectively in the delivery of capital construction projects.

## 3.2. Audit Scope and Methodology

### Audit Scope

The audit scope for this branch audit included a review of the two activities described in the audit objectives. We analyzed performance and financial data from the years 2000 to 2010. Our review of financial data included both operating and capital budgets and expenditures relating to these activities. This audit did not include a benchmark comparison with other municipalities but did include internal benchmark comparisons of costs and performance data.

### Audit Methodology

### Phase 1 - Audit Planning

*Audit planning includes the comprehensive identification and assessment of business risks and the selection of risk areas for further fieldwork.*

During the planning stage we consulted with staff from the Parks Branch to understand the Parks current environment and to identify and assess operational, project, and strategic risks. Parks Branch management is currently addressing many of the key risks such as staff retention and succession planning, climate change, tightening environmental controls, homeless camps, and increasing land assembly costs. Two areas emerged as high risk areas and presented the best opportunity for our office to add value through further review during this audit: management of urban forest and capital project management.

### Phase 2 - Audit Fieldwork

*Audit fieldwork includes the execution of planned audit programs in order to gather evidence and develop observations on management performance.*

- **Management of Urban Forest**

During the audit fieldwork we gathered and reviewed financial information directed towards urban forest management and met with staff to determine causes for performance trends and variances. We also selected a sample of maintenance activities

(tree pruning, tree planting, and pest management) and reviewed the operational performance of these activities by conducting on-site inspections and a review of management reporting.

- **Capital Project Management**

During the audit fieldwork we met with staff to develop an understanding of how the Parks capital budget is managed; including understanding roles and responsibilities, processes, and reporting. We obtained a complete listing of 2009 capital projects from which we selected a sample of specific projects for more detailed analysis. We further obtained detailed project files and reports for our review and assessment.

## Phase 3 - Audit Reporting

*Audit reporting includes the final presentation of findings, conclusions, and recommendations.*

During audit reporting, the results of our review were discussed and confirmed with Parks management and they provided action plans in response to our recommendations, which are included in this report.

# 4. Summary of Observations

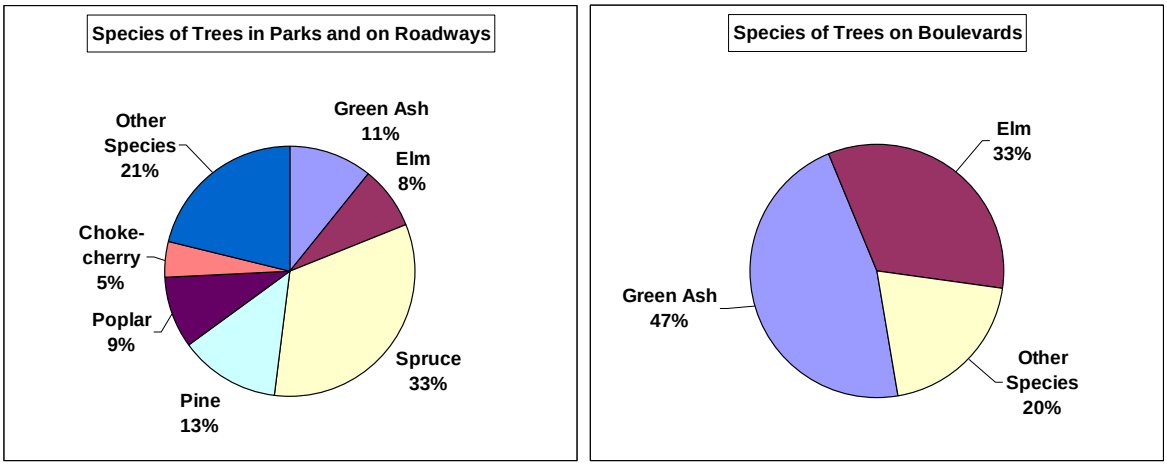
## 4.1. Management of the City's Urban Forest

The management of corporate assets requires that an organization conduct ongoing inventory and assessment activities. We observed that the Parks Branch maintains a detailed inventory of trees and has conducted a tree health assessment, which is consistent with good risk management practices.

### 4.1.1. The Urban Forest

The City's urban forest includes trees found in parks, roadways, boulevards, and in natural areas such as the river valley. As of 2009, the Parks Branch had a documented inventory of approximately 279,000 landscaped trees on parks, roadways, and boulevards. Trees in natural areas are not inventoried therefore the total number of trees for the entire urban forest is unknown. The following charts in Figure 1 illustrate the types of trees within parks, and on roadways and boulevards, where they have been electronically inventoried in the City's SLIM[2] software program.

Figure 1: Trees Species




As shown, the number of Elm and Green Ash trees makes up a significant percentage of the tree inventory for Parks and on Roadways, and Boulevards[3]. Most of the City's trees are currently experiencing a significant threat from drought, pests, and disease, which will be discussed further in the report.

### 4.1.2. Changing Environment

As a living asset, the City's urban forest is more susceptible to environmental changes than traditional assets such as roads and bridges. Since 2001, the Edmonton region has experienced drought conditions and weather extremes such as severe windstorms

[2] SLIM – Spatial Land Inventory Management System
[3] The Parks Branch tree inventory identifies three location areas: parks, on roadway buffers, and boulevards. Parks and roadway buffers are combined into one category.

which has had a significant negative impact on the health of the City's urban forest. The prolonged drought has allowed the introduction of new tree pests and diseases. Drought conditions have stressed trees and weakened their resistance to disease resulting in an increased loss of trees.

Table 4 illustrates the tree loss, replacement, and inventory growth records from 2000 to 2009. During this 10-year period the Parks Branch estimates the City lost 41,897 trees in established areas and replaced 15,560 for a net loss of 26,337 trees. During the first years of the drought period (2001-2005) tree losses far exceeded trees replaced. Since 2006 tree losses have somewhat stabilized and tree replacement numbers have increased, reducing the annual net loss of City trees.

Inventory Growth shown in Table 4 represents new trees planted in parks, on roadways and on boulevards. Inventory growth results from two sources. The first source is from developers who transfer ownership of trees to the City as part of development agreements. Secondly, new trees are added to the inventory through the completion of City capital budget projects. From 2000 to 2009, 36,957 new trees were added to the inventory. As the tree inventory increases, the Park Branch is further challenged to maintain these trees in an expanding geographic area.

Table 4: Tree Loss, Replacement, & Growth 2000-2009

| Year | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1. Losses | 1,851 | 6,146 | 4,300 | 5,200 | 6,200 | 4,300 | 3,000 | 3,400 | 4,100 | 3,400 | 41,897 |
| 2. Trees Replaced | 909 | 951 | 1,000 | 1,800 | 1,600 | 800 | 2,050 | 1,400 | 2,450 | 2,600 | 15,560 |
| Net Loss of Trees | (942) | (5,195) | (3,300) | (3,400) | (4,600) | (3,500) | (950) | (2,000) | (1,650) | (800) | (26,337) |
| 3. Inventory Growth | 3,259 | 2,248 | 5,100 | 3,450 | 3,350 | 3,800 | 4,100 | 2,350 | 4,800 | 4,500 | 36,957 |

In response to the significant environmental changes and emerging resource challenges, the Parks Branch is currently developing an Urban Forest Management Plan (UFMP) to guide the future management of the urban forest. The development of this plan is being led by the Parks Branch and includes representation from other City departments, numerous external organizations and resource groups. At a high level this document will provide a comprehensive plan for managing the urban forest, educating the general public, and protecting natural areas. Parks staff informed us that a draft UFMP is anticipated for public consultation in 2010.

### 4.1.3. Tree Assessment

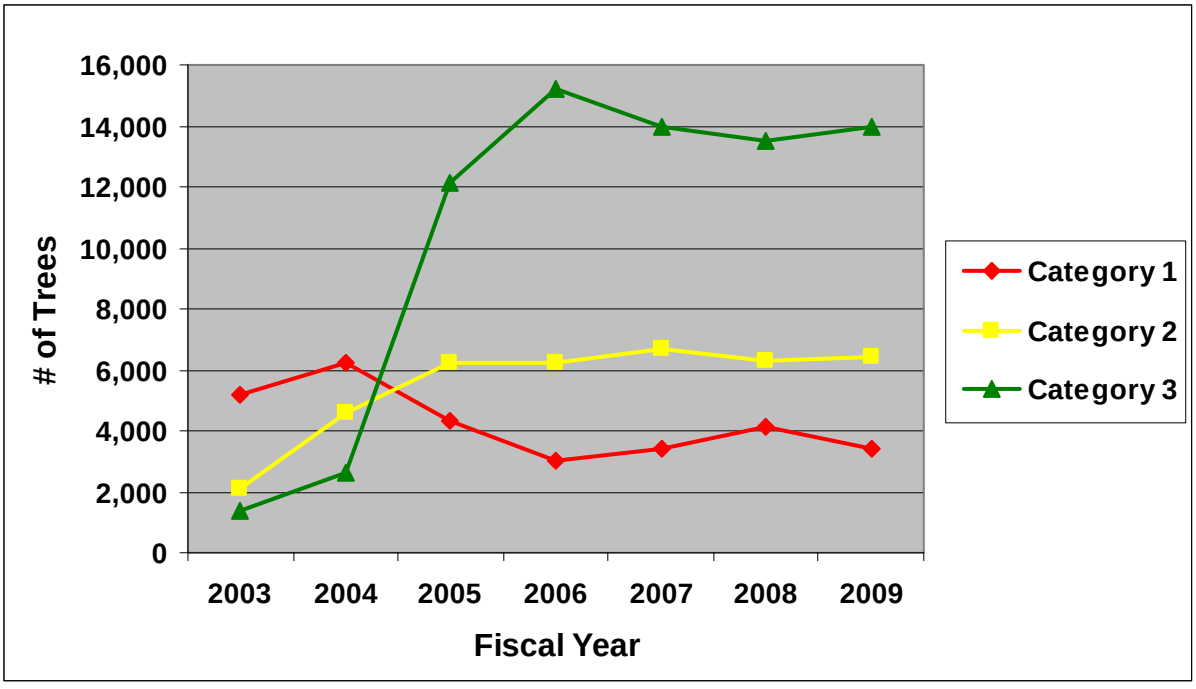
The Parks Branch conducted the first tree inventory in 1998 in an effort to account for all Elm trees and help prevent the risk of Dutch Elm Disease. In 2003 the Parks Branch began the process of an annual health assessment of all inventoried trees in parks and on roadways and boulevards. This proactive step was taken to monitor the overall tree health and to serve in the early detection of health issues. Beginning in 2005, wireless tablet computers equipped with GeoMedia software were used for inventory purposes. Tree inventory activities are also coordinated with tree pruning crews who receive tree location maps and record information that is used to update the tree assessment and tree pruning records.

The Tree Health Assessment rating system, developed by the Parks Branch, includes three categories as described below:

- **Category 1** – Trees are dead or with no hope of survival and will be removed.
- **Category 2** – Trees are in questionable health and may not survive. Additional resources such as additional watering, fertilizing, and pest management will be used if there is a possibility that the trees can recover.
- **Category 3** – Trees show promise of recovery and every effort will be made to assist in the recovery of trees.

We used the Parks Branch tree assessment data to develop the graphs shown in Figure 2. In 2009, there were approximately 3,400 trees in the first Category, 6,400 trees in Category 2, and 14,000 trees in Category 3. Trees that are not included in this listing are considered healthy trees. As previously identified, the City's total 2009 inventory of trees is 279,000 therefore the remaining 255,200 (91%) inventoried trees are considered healthy.

Figure 2: Tree Health Assessment




The number of trees shown in Category 1 represents the new number of dead trees identified on an annual basis. Based on the City's total inventory, a loss of 3,400 trees represents a 1.2% mortality rate or the equivalent of 12 trees lost for every thousand trees. As shown, from 2006 to 2009, the number of Category 1 or "Dead" trees appears to be stabilizing at approximately 3,500 trees per year. The number of trees in Category 2 "Questionable Health" has leveled since 2005 at approximately 6,400. From 2004 to 2006 the number of trees in Category 3 "Promise of Recovery" spiked to approximately 15,000 trees. The primary reason for this sharp increase is that all Black Ash and Birch trees, stressed from drought and tree pests, were added to the monitoring list in 2005.

## 4.2. Review of Work Programs

Within the Parks Branch, there are 47 specific activities relating to urban forest management. We met with Parks staff to gain a greater understanding of urban forest management to determine which activities would be the most representative of their efforts in managing the urban forest. The activities that we selected were: 1) tree pruning, 2) tree planting, and 3) pest management.

### 4.2.1. Tree Pruning

Tree pruning is an important activity that improves tree appearance and also adds to the asset value of the tree. The removal of dead and weakened tree branches is required to maintain the safety of the public. Tree pruning is also an important health care strategy because it reduces the potential for tree pest and disease infestation.

We learned that the recent environmental changes, such as storm damage and an extended drought, have created resource challenges for the Parks Branch in their efforts to maintain the health of the urban forest. The Parks Branch have responded by shifting operating resources from tree pruning activities to other activities such as tree watering in order to limit tree losses. Additionally, the Parks Branch has shifted resources to tree and stump removal, as well as to tree planting in order to replant lost trees. Our analysis illustrates that these resource shifts have been occurring since 2004 and that perhaps new norms have now been established which the Parks Branch must take into consideration as part of their resource planning. We have therefore recommended that the Parks Branch review its planning and budgeting efforts relating to tree-pruning activities given the importance of this proactive activity.

**Field Review**

We conducted several on-site visits with in-house tree pruning crews to gain a better understanding of the work performed and work challenges faced. Figure 3, on the following page, illustrates a City crew conducting tree pruning with a new environmental-friendly hybrid truck.

Overall, we learned that this pruning crew was quite pleased with the hybrid truck performance, and indicated that it was quieter and faster than the older aerial trucks. This larger truck can be positioned such that four large trees can be pruned at once before the truck needs repositioning. In total, we visited four work sites and observed that the crews were working safely and had marked off areas where tree pruning was taking place.

Each City pruning crew typically includes two workers, which are classified as an Arborist 1 or 2 and a Labourer. The Labourer worker performs grounds clean-up, chipping, and information recording. Both Arborist 1 and 2 workers perform aerial tree pruning duties. The Arborist 2 additionally performs more complex arboriculture work and also provides training and mentoring to the Arborist 1 or Labourer. The Parks Branch indicated that they created these new classifications in order to create a career path for arborist workers and to improve staff retention in this area.

Figure 3: In-house Tree Pruning Activities

**Contract versus In-house Resources**

The current tree pruning program is completed with a mix of contract and in-house resources. Shown in Table 5 is a breakdown of the budgeted and actual contract and in-house resources allocated for tree pruning.

Table 5: Contract versus In-house Pruning Resources

| Fiscal Year | Annual Budget for Contracted Pruning | Budgeted Contract Pruning % | Actuals for Contracted Pruning | Annual Budget for In-house Pruning | Budgeted In-house Pruning % | Actuals for In-house Pruning |
|---|---|---|---|---|---|---|
| **2004** | $ 234,256 | 26% | $ 290,011 | $ 672,483 | 74% | $ 237,413 |
| **2005** | $ 207,450 | 25% | $ 272,157 | $ 615,175 | 75% | $ 211,086 |
| **2006** | $ 234,200 | 26% | $ 300,065 | $ 661,148 | 74% | $ 430,760 |
| **2007** | $ 770,275 | 45% | $ 665,922 | $ 950,871 | 55% | $ 420,976 |
| **2008** | $ 924,835 | 47% | $ 810,608 | $ 1,060,091 | 53% | $ 452,325 |
| **2009** | $ 1,060,400 | 48% | $ 991,297 | $ 1,142,630 | 52% | $ 400,933 |

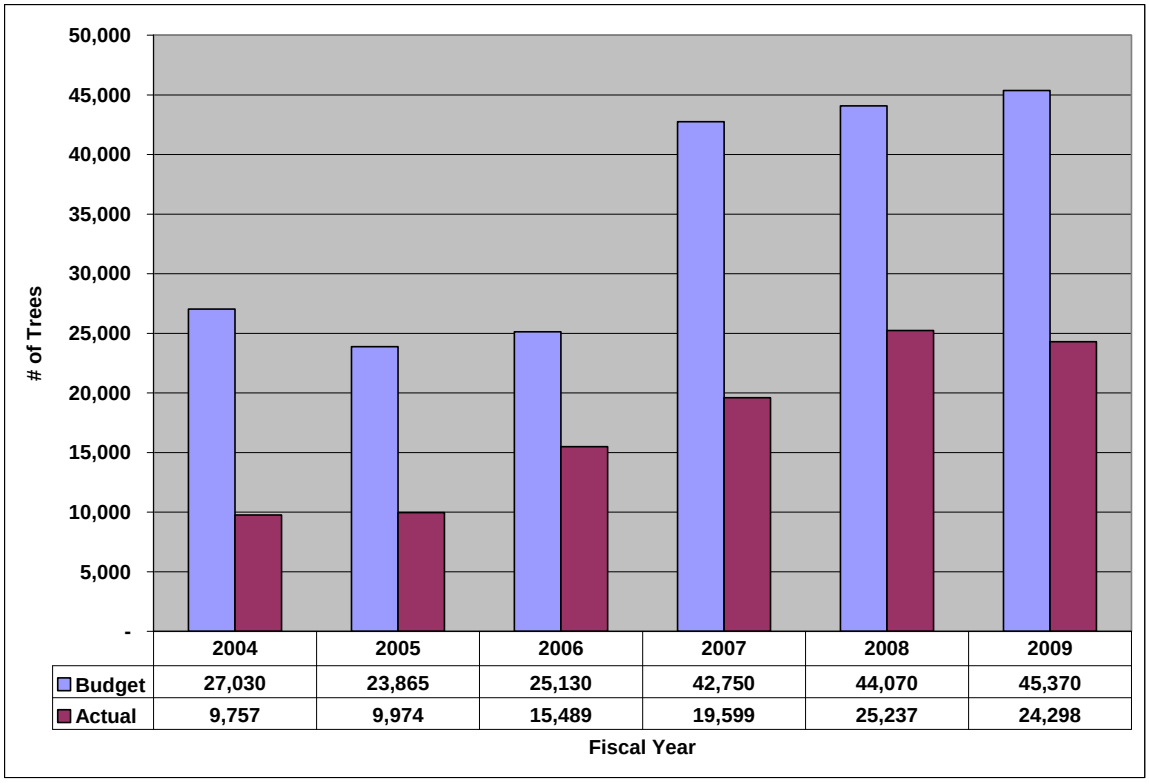
As shown, the Parks Branch has increased budgeted contract pruning from 26% in 2004 to 48% in 2009. Actual contract tree pruning expenditures are also near budgeted

levels for all years in contrast to actual in-house tree pruning levels, which are significantly below budgeted levels.

### Tree Pruning Accomplishments

The Parks Branch strives to prune all City Elm trees every four years and all other tree species every seven years. Shown in Figure 4 are the combined 2004-2009 tree pruning planned and actual accomplishments for both contracted and in-house resources. Over the last six years tree pruning accomplishments were significantly below planned levels. In 2009, there were 45,000 total tree prunings planned and only 24,000 were completed; mostly attributed to in-house resources being shifted away from tree pruning. We estimated that between 2007 and 2009 that approximately $2.2 million in resources was shifted away from the tree pruning program, which equates to a full year of planned tree pruning activity.

Figure 4: Combined Tree Pruning Accomplishments



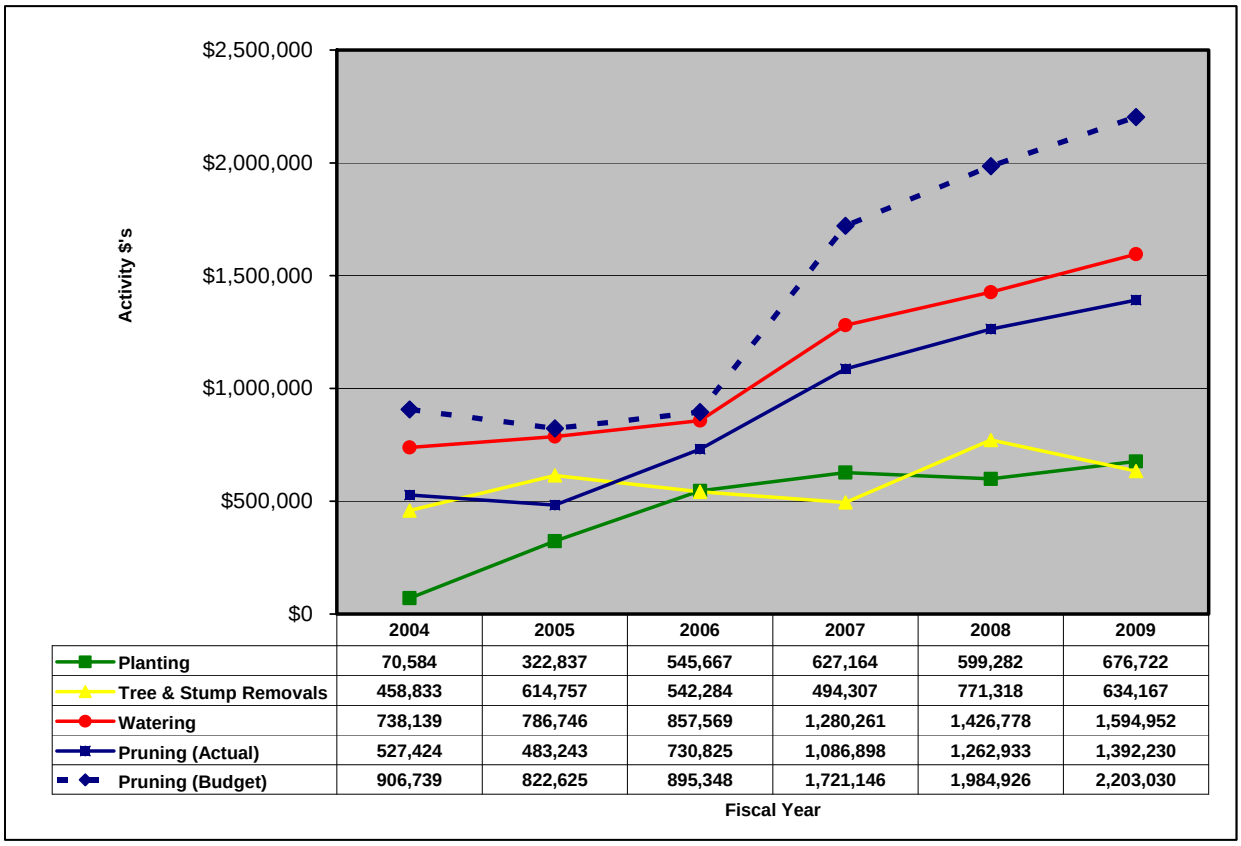

| | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|---|---|
| Budget | 27,030 | 23,865 | 25,130 | 42,750 | 44,070 | 45,370 |
| Actual | 9,757 | 9,974 | 15,489 | 19,599 | 25,237 | 24,298 |

### Resource Shift

We discussed the reduced tree pruning activity with Parks Branch staff. As shown in Figure 5, on the following page, the planned tree pruning budget increased from $907,000 in 2004 to $2.2 million in 2009. Although tree pruning activity increased during this same time period, it did not meet planned levels. The Parks staff confirmed that tree pruning resources have been shifted to higher priority activities in response to the ongoing drought, storm damage repair work and tree losses. These activities include tree planting, contract tree watering, and tree and stump removal. Figure 5 illustrates the resource shift to these activities.

In 2009 the Branch spent $634,000 on tree and stump removal, which was $320,000 more than planned for these activities. The Parks Branch indicated that removing dead trees and stumps is a priority since they pose a safety issue to the public and are also unsightly in appearance. In 2009 the Parks Branch performed 4,349 tree actual removals using in-house and contract resources, in comparison to the plan for 2,337 trees. In-house tree planting activity also increased significantly since 2004 with actual expenditures increasing from $71,000 in 2004 to $677,000 in 2009.

Figure 5: Activity Cost Increases




| | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|---|---|
| Planting | 70,584 | 322,837 | 545,667 | 627,164 | 599,282 | 676,722 |
| Tree & Stump Removals | 458,833 | 614,757 | 542,284 | 494,307 | 771,318 | 634,167 |
| Watering | 738,139 | 786,746 | 857,569 | 1,280,261 | 1,426,778 | 1,594,952 |
| Pruning (Actual) | 527,424 | 483,243 | 730,825 | 1,086,898 | 1,262,933 | 1,392,230 |
| Pruning (Budget) | 906,739 | 822,625 | 895,348 | 1,721,146 | 1,984,926 | 2,203,030 |

Fiscal Year

Contract watering has seen significant increases in the last four years with expenditures from $738,000 in 2004 to $1.6 million in 2009. The Parks staff indicated that this is an important activity in reducing tree losses. As previously shown in Table 4, the City lost 6,200 trees in 2004 but in 2009 annual tree losses were reduced to approximately 3,400 trees assisted in part by contracted watering.

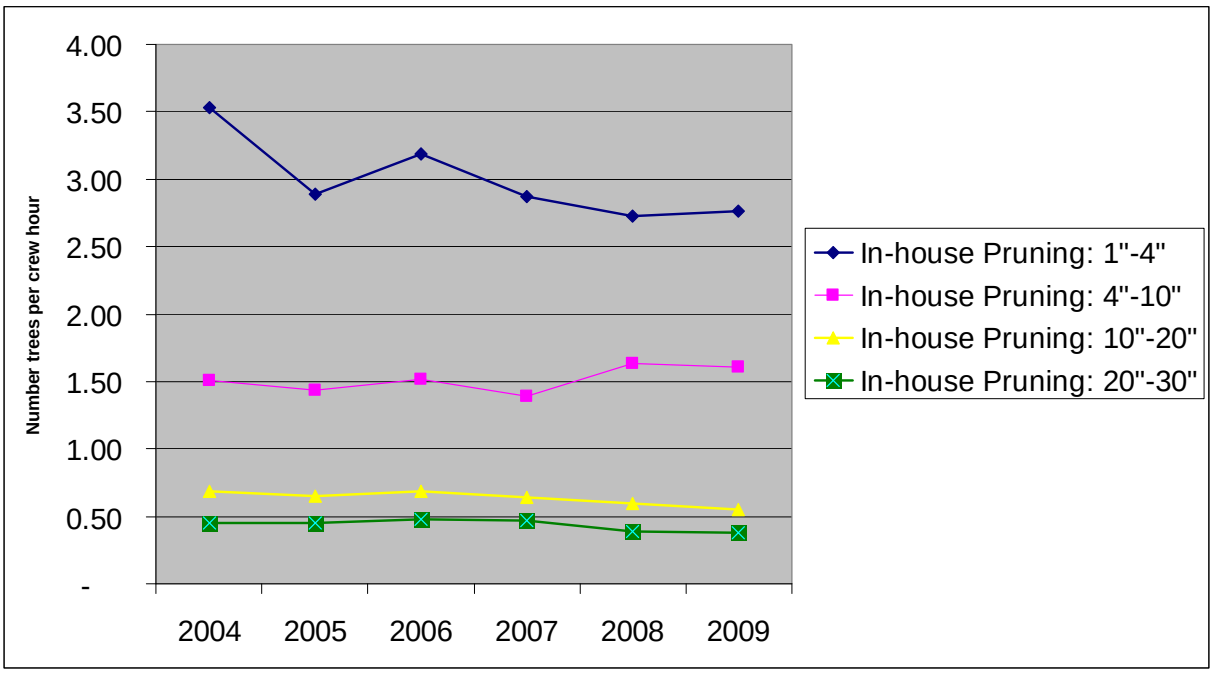
The additional costs of stump and tree removal, contract watering, and in-house tree planting have not been solely born at the expense of operational tree pruning. As described in the City Policy C456 Corporate Tree Management, the City is to maintain a Tree Reserve Account which accumulates reserves based on recovery of damages and appropriations of City-owned trees. From years 2004 to 2009 the Tree Reserve Account has seen accumulations of nearly $1.8 million. From 2004 to 2009, approximately $1.3 million of these funds were transferred to the operating budget for tree planting and

$450,000 for tree watering. The Tree Reserve Account balance as at December 31, 2009 was $516,000.

### Tree Pruning Productivity

As shown in Figure 6, overall in-house tree pruning productivity has declined slightly in some categories but is relatively stable overall.

Figure 6: In-house Tree Pruning Productivity




Parks staff indicated several reasons why productivity is declining slightly in some categories. Staff turnover has occurred and newer, less experienced staff has reduced productivity. Staff also indicated that equipment downtime hurts operational performance. Finally, in-house staff is responsible for responding to notifications (eg. calls from citizens) relating to health and safety issues such as fallen trees and broken branches. These intermittent calls interrupt planned maintenance work resulting in decreasing overall pruning activity and efficiency. Shown in Table 6 is the increase in calls (notifications) received since 2005. In 2008 and 2009, several wind storms resulted in a significant increase in the number of tree notifications.

Table 6: Forestry Notifications

| Year | Number of Notifications |
|---|---|
| 2005 | 3,722 |
| 2006 | 3,357 |
| 2007 | 3,560 |
| 2008 | 5,204 |
| 2009 | 7,538 |

### Tree Pruning Unit Costs

Within the tree pruning activity, the Parks Branch has organized work into four tasks based on estimated tree diameter. Only City staff (in-house) maintain younger trees (one to four inch diameter) as it is important to train smaller trees for good structure since they are more susceptible to damage. The larger tree sizes (four to ten inch, ten to twenty inch, twenty to thirty inch) are maintained by both in-house and contract staff.

Shown in Table 7 is a comparison of direct tree pruning unit costs for both in-house and contract resources. The City's in-house unit costs are lower than contracted units costs for smaller trees (4" -10", and 10"-20" trees) but higher for the larger trees (20"-30" trees). For the 4"-10" trees, the in-house 2009 unit cost of $22.03 is lower than the contract price of $31.09. The 2009 in-house cost is also slightly better for 10"-20" trees with the in-house cost of $69.36 per tree compared to the contract cost of $75.18. However, the 2009 unit cost for the larger tree diameter of 20"-30" is $88.84 for contracted pruning in comparison to an in-house cost of $103.60 per tree.

Table 7: Tree Pruning Unit Costs – (Per Tree)

| | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|---|---|
| In-house Pruning: 1"-4" | $ 8.26 | $ 10.77 | $13.75 | $13.70 | $ 13.81 | $ 12.73 |
| In-house Pruning: 4"-10" | $ 19.91 | $ 22.16 | $23.87 | $28.53 | $ 21.84 | $ 22.03 |
| In-house Pruning: 10"-20" | $ 44.14 | $ 50.55 | $56.28 | $60.86 | $ 63.82 | $ 69.36 |
| In-house Pruning: 20"-30" | $ 71.55 | $ 71.99 | $93.10 | $84.30 | $ 97.80 | $103.60 |
| | | | | | | |
| Contracted Pruning: 4"-10" | $ 53.83 | $ 37.56 | $49.92 | $44.61 | $ 39.37 | $ 31.09 |
| Contracted Pruning: 10"-20" | $133.91 | $ 72.58 | $76.29 | $76.18 | $ 80.54 | $ 75.18 |
| Contracted Pruning: 20"-30" | $161.91 | $103.04 | $92.75 | $73.11 | $110.96 | $ 88.84 |

In summary, we conclude resources are being used efficiently for both in-house and contract tree pruning as we observed comparable unit costs, and relatively stable in-house productivity. The Parks Branch missed its tree pruning targets because it shifted resources to deal with drought and storm damage. We believe this shifting of resources away from tree pruning may have a negative long-term impact on the health of the urban forest.

| Recommendation 1 | Management Response and Action Plan |
|---|---|
| The OCA recommends that the Parks Branch Manager review and reallocate as appropriate, the current shift of resources away from tree pruning activities given the importance of this activity in maintaining the health of the City's urban forest. | **Accepted**<br>**Action Plan:**<br>Parks Management agrees that tree pruning activities are important to the health of the City's urban forest. The Parks Branch Manager will review the resource allocations to the various activities relating to urban forest management as well as the resource allocations to other Parks activities with a focus on maintaining the health of the urban forest. Keeping in mind the 2010 budget reductions and the current scarcity of resources, Parks Management will develop an allocation plan that considers carefully the new norms created by the prolonged drought and the need to balance Parks infrastructure needs with services to meet the needs and expectations of the public.<br><br>**Planned Implementation Date:** December, 2010<br><br>**Responsible Party:** Parks Branch Manager |

### 4.2.2. Tree Planting

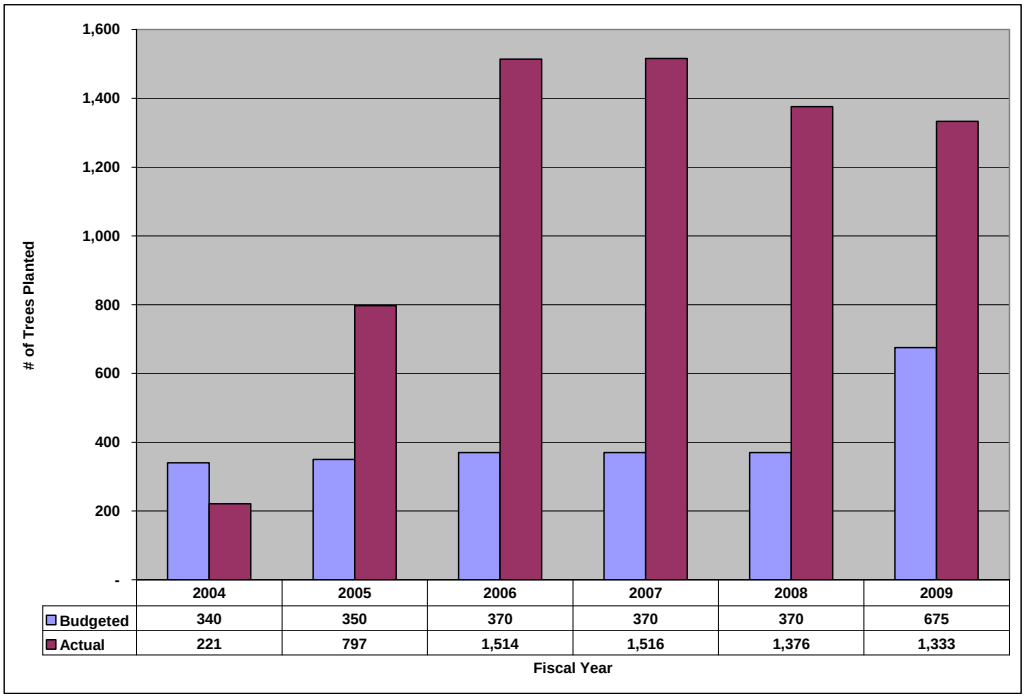
Tree planting is an activity that is performed under operating and capital programs using both in-house and contract resources. We therefore reviewed both in-house and contract tree planting activities in operating and capital programs during the analysis of this activity. Within the Parks Branch operating program, in-house tree planting resources are primarily deployed in replacing existing tree losses. The Parks Branch priority is to first replace tree losses on boulevards, with parks and roadway buffer trees being replaced as resources permit. Under the Parks capital program, contract resources are used to replace existing tree losses and also to add new trees to park areas.

We observed that in-house tree planting activities have exceeded planned activities since 2005. Through our comparison of in-house to contract unit costs, we observed that the City's 2008 and 2009 in-house direct tree planting costs are significantly less than the contracted tree planting costs. We reviewed the contract tendering for tree planting and observed that maintenance costs were included which we believe should be considered operating budget expenditures. Finally, we observed what we believe are excessive contract specifications for tree planting which may have limited competition. We have recommended that the Parks Branch conduct a detailed review of its tendering practices.

### In-house Tree Planting Levels

As shown in Figure 7, actual in-house tree planting has significantly exceeded budgeted plantings since 2005 further demonstrating resources shifting away from tree pruning as previously discussed.

Figure 7: In-house Tree Planting – Accomplishments




### Tree Planting - Unit Cost per Tree

Figure 8 illustrates a typical newly planted tree. This particular tree is one that was planted under the 2009 Replacement of Drought Damaged Trees program. The contract specifications indicate trees supplied must be 60 millimeters (two and a half inches) in diameter.

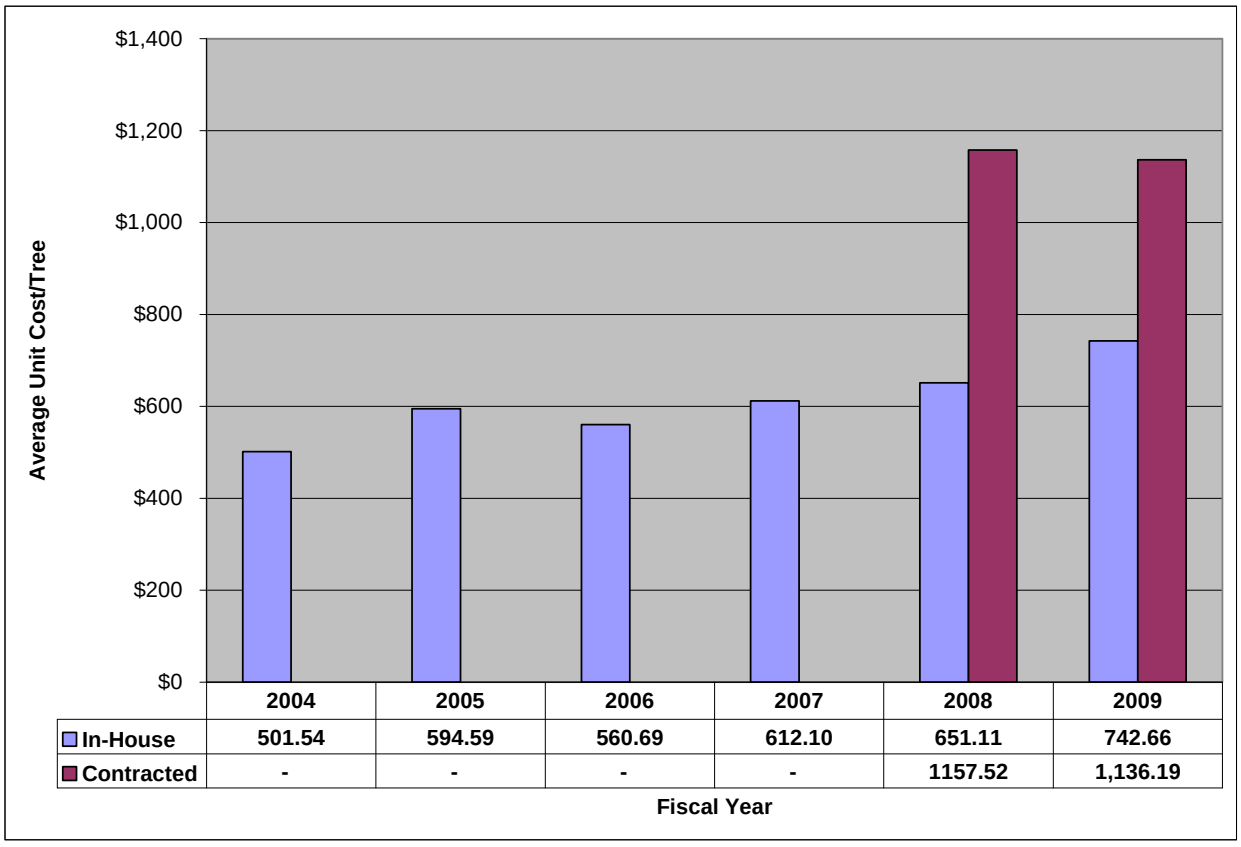
Figure 8: Tree planted under 2009 Capital Program

Figure 9, illustrates the rising cost of in-house tree planting. Since 2004, the actual direct cost of in-house tree planting has risen from $501.54 to $742.66 in 2009. These costs include all labour, equipment, and material needed to supply and plant a new tree. In order to make the in-house tree planting unit costs directly comparable to the contracted costs, we have included one-year tree maintenance costs (watering, fertilizing, and tree pruning) and a 10% warranty replacement provision.

As illustrated in Figure 9, the 2008 and 2009 contracted tree planting unit costs are significantly higher than in-house tree planting costs. The 2009 contracted tree planting unit cost of $1,136.19 per tree is 53% higher than the in-house tree planting cost of $742.66 per tree. Given the significant premium paid for contracted tree planting costs, we further analyzed contracted tree planting activities.

Both in-house and contract unit costs discussed above include only direct costs. Fixed overhead costs such as administration, computer systems and facilities, equivalent to 39.1%, were not included in this comparison because they would apply equally to both contract and in-house costs.

Figure 9: Tree Planting Unit Costs




| | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|---|---|
| In-House | 501.54 | 594.59 | 560.69 | 612.10 | 651.11 | 742.66 |
| Contracted | - | - | - | - | 1157.52 | 1,136.19 |

## Contract Tree Planting

With the prolonged drought conditions, the Parks Branch began to recognize that the tree losses sustained could not be replaced solely with in-house operating resources.

The Parks Branch requested and received $2.3 million in capital funding in 2003 and 2004 for the replacement of 4,000 trees damaged by drought. Additionally, a capital budget request of $3.7 million in capital funding was approved for tree replacement planting for budget years 2008, 2009, and 2010. We observed that this latest capital budget request for funding did not specify the number of trees that would be replaced for the approved funding. As described below, we learned that on two separate occasions the Parks Branch reported the expected results from the approval of this funding for tree replacement.

- On October 27, 2005, in a report to the Community Services Committee, Parks Branch indicated that the $2.5 million dollar capital project for 2008 and 2009 would result in the planting of 4,300 trees. A further $1.2 million capital budget request was recommended for 2010 and it was anticipated at this time that 2,000 additional trees would be planted. In total the $3.7 million in capital budget funding was expected to result in a combined total of 6,300 trees planted to assist replacing those lost due to drought.

- On July 2, 2008, in a report to the Transportation and Public Works Committee, Parks Branch modified its expectations and indicated that 1,500 to 1,700 trees would be replaced per year for the approved funding which had now grown from $3.7 million to $3.8 million. Based on these revised estimates, we calculate that 4,500 to 5,100 total trees were to be planted for the $3.8M funding provided.

We reviewed the contract tender results of the capital program, which is illustrated in Table 8. As shown, the City can expect to receive a total of 3,009 trees planted through the Replacement of Drought Damaged Trees capital program which is significantly less than what was anticipated. The actual number of trees that will be planted is approximately 2,000 trees less the 2008 estimate and over 3,000 trees less than the original 2005 estimate.

Table 8: Replacement of Drought Damaged Trees Program

| Year | Contract Price During Bid Submission (Total Tender Sum) | Estimated Quantities Of Trees In Bid | Contract Average Unit Price |
|---|---|---|---|
| 2008 | $810,264 | 700 | $1,157 / tree |
| 2009 | $1,363,425 | 1,200 | $1,136 / tree |
| 2010 | $1,315,797 | 1,109 | $1,186 / tree |
| **Total** | **$3,489,486** | **3,009** | **$1,160 / tree** |

As shown in Table 8, current contracted costs to date are approximately $3.5 million. These contract costs include a 1-year maintenance period after the issuance of the Construction Completion Certificate. We learned that Parks Construction has added an additional second year of maintenance and warranty provision for the trees planted by the vendor. The cost for this second year maintenance is not included in the Total Tender Sum shown in Table 8. The remaining $300,000 from the original $3.8 million of the 3-year Replacement of Drought Damaged Trees capital program will be consumed

by costs for second year maintenance and warranty as well as project management costs.

We analyzed the awarded contracts to understand why contract costs are higher than in-house costs. Following is a summary of key reasons we believe contribute to these higher costs.

### Contract Tendering

The tree planting contract was tendered in one large single contract for each year from 2008 to 2010. We reviewed the City's 2009 pre-qualified vendors listing which included 12 vendors. Of this listing only three vendors were capable to bid on jobs in excess of $1 million. Given the significant size of this tender, the other pre-qualified vendors did not have the capacity to meet the size of this large single contract; thereby we believe competition was limited.

Table 9 highlights the number of vendors who were ultimately invited to and subsequently submitted bids for this project. In 2008 and 2009, while only two vendors were invited to bid, only one vendor ultimately submitted a bid in each year. In 2010, three vendors were invited to bid and only two vendors ended up submitting bids; one an Edmonton based company and the other a Calgary based company. In all three years, the contract was awarded to the same vendor.

Table 9: Contractors Bids on Drought Tree Program

| Year | Number of Vendors Invited to Bid (Qualified) | Number of Vendors that Submitted Bids |
|---|---|---|
| 2008 | 2 | 1 |
| 2009 | 2 | 1 |
| 2010 | 3 | 2 |

### Contract Specifications

We believe contract specifications were excessive and further limited competition. The tree planting contract specifications in the tree replacement contract call for a one year warranty and maintenance with option for a second year of warranty and maintenance. Under normal City contract terms, vendors are expected to develop assets and transfer ownership to the city but are not normally expected to provide ongoing maintenance. Furthermore, the provision of maintenance such as watering, fertilizing, and tree pruning is normally considered to be operating expenditures however in this case was provided through capital funding.

We also learned that the 2010 specifications required that all trees be registered using specific software or compatible software that added additional costs to the bid. Use of this specific software requires user registration fees, a fee per tree registered, electronic tags, bar code scanners, and administration costs. As this software is relatively new to the industry, many vendors are not equipped to meet this specification and we believe this acted as a barrier and limited competition. Additionally, we learned that this specific software was included in the 2010 contract specification, and was in fact, developed

and promoted by the same vendor who received the 2008, 2009, and subsequently the 2010 bid. Therefore, this vendor would bear less cost than other competing vendors.

Given that Forestry staff will ultimately assume responsibility for the trees, we asked them of their knowledge of this software. Forestry operation staff stated they had knowledge of this software but were not aware that this was a requirement in the 2010 contract specifications. Furthermore, Forestry staff indicated that their own electronic inventory system provides this functionality.

In summary, we believe the combination of inefficient contract tendering and excessive contract specifications contributed to significantly higher contract tree planting costs. Given that the City has demonstrated it could supply and plant a tree in 2009 for $743, we estimated that the 3,009 trees supplied and planted under the capital program could have been planted for approximately $2.2 million assuming in-house City costs in contrast to the $3.5 million paid to date under the capital program. However, to achieve these savings, we acknowledge additional in-house resources would have to be hired. In conclusion, we believe that the City did not receive value for money through the Replacement of Drought Damaged Trees capital program and contracted tree planting.

| Recommendation 2 | Management Response and Action Plan |
|---|---|
| The OCA recommends that the Parks Branch Manager conduct a formal review of all Branch tendering practices. This review should:<br>• Define industry capacity by considering local market conditions,<br>• Develop an effective strategy for contract threshold levels (i.e., volume of work),<br>• Identify targets for the expected minimum number of bids to be received,<br>• Compare in-house costs to expected contract unit costs,<br>• Rationalize contract tender specifications against in-house work methods and procedures,<br>• Consider and evaluate all risks, costs, and benefits, and<br>• Ensure that the outcomes achieved, demonstrate best value for the City on a go forward basis. | **Accepted**<br>**Action Plan:**<br>Parks Management will work with Materials Management to complete a further program analysis of the in-house and contract tree planting programs to compare cost, quantities and value of the tree planting program. Depending on the outcome of this analysis, Parks will target the review of tendering and in-house work capacities to create a plan to achieve the best value for planting trees in the City of Edmonton. Parks tree planting standards are currently under review to meet new climate conditions, plant sustainability and on street safety programs. Planting programs or opportunities may be delayed if in-house capacity to complete the work is not available.<br><br>**Planned Implementation Date:**<br>December, 2010<br><br>**Responsible Party:** Parks Branch Manager |

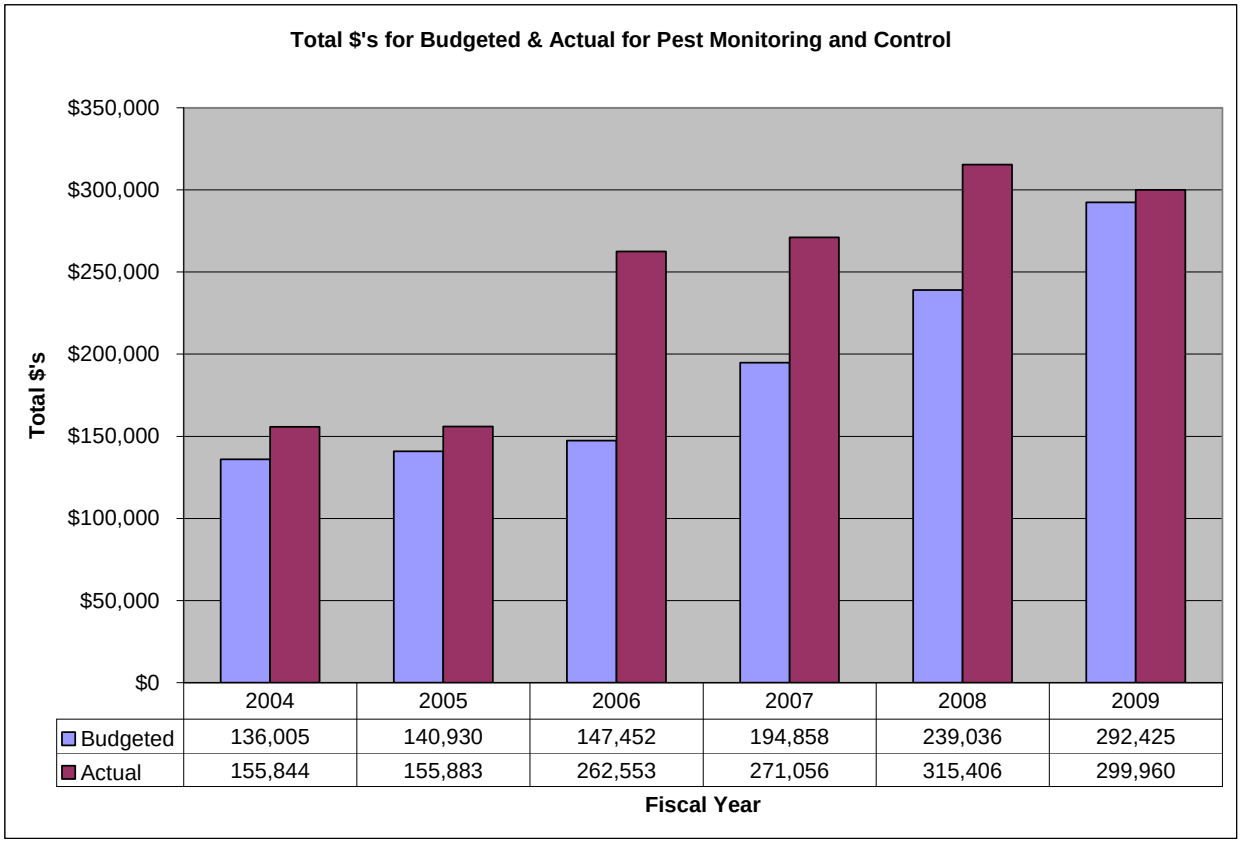
## 4.2.3. Pest Management

### The Role of Pest Management

We observed that the Pest Management area has a high level of risk awareness of current and emerging risks and has taken proactive steps to managing risks to the urban forest. Pest Management is highly engaged internally within the Parks Branch and also with numerous outside organizations in this endeavor.

The City of Edmonton is an economic hub for railway and highway transportation but because of this opportunity, the urban forest faces the ongoing risk of new forest pest introduction. The Parks Branch operates a year-round pest management program that includes both laboratory and field operations to monitor and control this and other ongoing risks to the urban forest. The pest management laboratory's key tasks include pest identification and monitoring, technical support, public education, and research. Figure 10 illustrates budgeted and actual resources for the Pest Management area. From 2006 to 2008, actual pest management activities increased in response to environmental challenges such as drought and pest infestation. As shown in Figure 10, resources were slowly reallocated from 2007 to 2009 to address these increased pest management activities and costs.

Figure 10: Pest Management Costs




| | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 |
|---|---|---|---|---|---|---|
| Budgeted | 136,005 | 140,930 | 147,452 | 194,858 | 239,036 | 292,425 |
| Actual | 155,844 | 155,883 | 262,553 | 271,056 | 315,406 | 299,960 |

The Parks Branch works with many partners in its efforts to protect the urban forest including the Federal and Provincial governments, and adjoining municipalities. In Canada, the Canadian Food Inspection Agency has the legislative mandate to prevent introduction and establishment of alien invasive pests and the Parks Branch collaborates regularly with them on this goal. The Parks Branch also reports annual pest conditions to Alberta Sustainable Resources and Development (ASRD) for their annual report. Additionally, the Parks Branch work with the University of Alberta and the Alberta Research Council to study forest pests and diseases as well as research on new techniques for forest management. Some examples of research that have been conducted include improving soil conditions and new watering techniques to improve plant health. Finally, the Parks Branch also works with non-profit organizations such as the Society to Prevent Dutch Elm Disease in Alberta (STOPDED) as part of an on-going public awareness campaign.

In 2009, a study was commissioned by ASRD that provided an assessment of Forest Pest Detection and Monitoring in Alberta.[4] The consultant provides a specific assessment of the City of Edmonton and its efforts stating:

> *"In general, it appears that the City of Edmonton is well organized and prepared for forest pest detection and monitoring. The City leads the urban forest pest management in Alberta and perhaps in Canada, considerably ahead of other municipalities in Alberta. It also has strategic thinkers looking at the future issues and threats."*

**Managing Pest Risks to the Urban Forest**

As part of this audit we reviewed how the Pest Management area is responding to three specific tree pests that threaten the health of the urban forest.

- ***Dutch Elm Disease (DED)*** is a fatal fungal disease that infests only Elm trees. The disease is transported from tree to tree on the body of European or native Elm Bark Beetles. Alberta is currently free of DED and is one of only two locations in North America free of DED (British Columbia being the other location). The Parks Branch has taken aggressive steps to combat DED, including pest detection and monitoring of the Elm Bark Beetle. Parks Branch works to keep the City's Elm population healthy by watering during dry periods. City owned Elm trees are pruned on a four-year cycle removing weakened or dead branches, which limits opportunities for growth of the Elm Bark Beetle. In contrast, all other species of City trees are pruned on a planned seven-year cycle.

  The Parks Branch also works to educate the public in combating this disease and solicit their aid in managing privately owned trees. The City's Community Standards Bylaw C14600 provides specific reference to public responsibilities in caring for Elm trees including how and when trees are to be pruned.

[4] "Analysis of Forest Pest Detection and Monitoring in Alberta", March 2009, Prepared by: Hideji Ono, Forest Health Consulting, hired through Alberta Sustainable Resources and Development

- ***Cottony Psyllid*** is a recently introduced insect to the Edmonton area, being first discovered here in 2000. Cottony Psyllids attack Black and Manchurian Ash, but not Green Ash. To date this tiny pest has contributed to killing almost all of the City's estimated 20,000 Black Ash trees. In general, trees that are kept healthy and in optimum growing conditions are better able to sustain insect attacks. The Parks Branch believe that the combination of drought tree stress and the affects of the Cottony Psyllid resulted in the collapse of the Black Ash population which now is at only approximately 1,500 trees city-wide.

  The Parks Branch continues to monitor the Cottony Psyllid threat and its impact on the City's trees. They have found that Manchurian Ash was more resilient to drought and survived the Cottony Psyllid attack. The City is no longer planting Black Ash trees and has responded by replacing the Black Ash tree losses with trees that are more drought-resilient, such as Oak trees.

- ***Emerald Ash Borer*** is the latest emerging pest threat to Edmonton's urban forest. Currently this tree pest is damaging forests in Eastern Canada. The Emerald Ash Borer is an invasive species to North America and is believed to have arrived from Northern China or Siberia. Since its accidental introduction into the United States and Canada in the 1990's and its subsequent detection in 2002http://en.wikipedia.org/wiki/Emerald_ash_borer - cite_note-0#cite_note-0, it has spread to 11 states and adjacent parts of Canada. It has killed at least 50 million Ash trees so far and threatens to kill most of the Ash trees throughout North Americahttp://en.wikipedia.org/wiki/Emerald_ash_borer - cite_note-1#cite_note-1. Unfortunately there is currently no known defense against this tree pest which attacks all species of Ash. Shown in Figure 11 is a photo of the Emerald Ash Borer.

Figure 11: Emerald Ash Borer

Photo Source: http://en.wikipedia.org

The Emerald Ash Borer poses a major threat to the City simply because the Green Ash is the single largest tree species in Edmonton's urban forest. There are over 75,000 Green Ash trees which represents almost 25% of the entire tree inventory.

The Emerald Ash Borer to date has not been detected in Edmonton. The Parks Branch is also working with the Canadian Food and Inspection Agency to monitor material that could potentially transport the Emerald Ash Borer to the City's geographic area. Primary movement is through infected firewood and nursery stock. Given that the infestation is already in Ontario, the staff informed us that the City is not purchasing Ontario tree nursery stock as a proactive measure.

In summary, we believe that the Parks Branch has taken a proactive approach to the management of risks to the urban forest in the pest management area. This proactive approach includes strong partnering with internal and external resources to understand and manage risks through research, education, detection and monitoring activities.

## 4.3. Parks Capital Program Management

In our review of the Parks capital program we observed that the Parks Branch faced challenges in completing capital projects approved due to issues relating to land acquisition, grant funding, and internal capacity. We observed that many of the capital budget profiles that the Parks Branch have submitted for funding are lacking in project description and details which we believe is necessary to improve transparency and accountability in the delivery of capital programs. Upon reviewing financial details of the Branch we observed excessive levels of overtime for Parks project management staff. Finally, current project management information systems are deficient in their ability to provide useful project management reports to staff engaged in this activity.

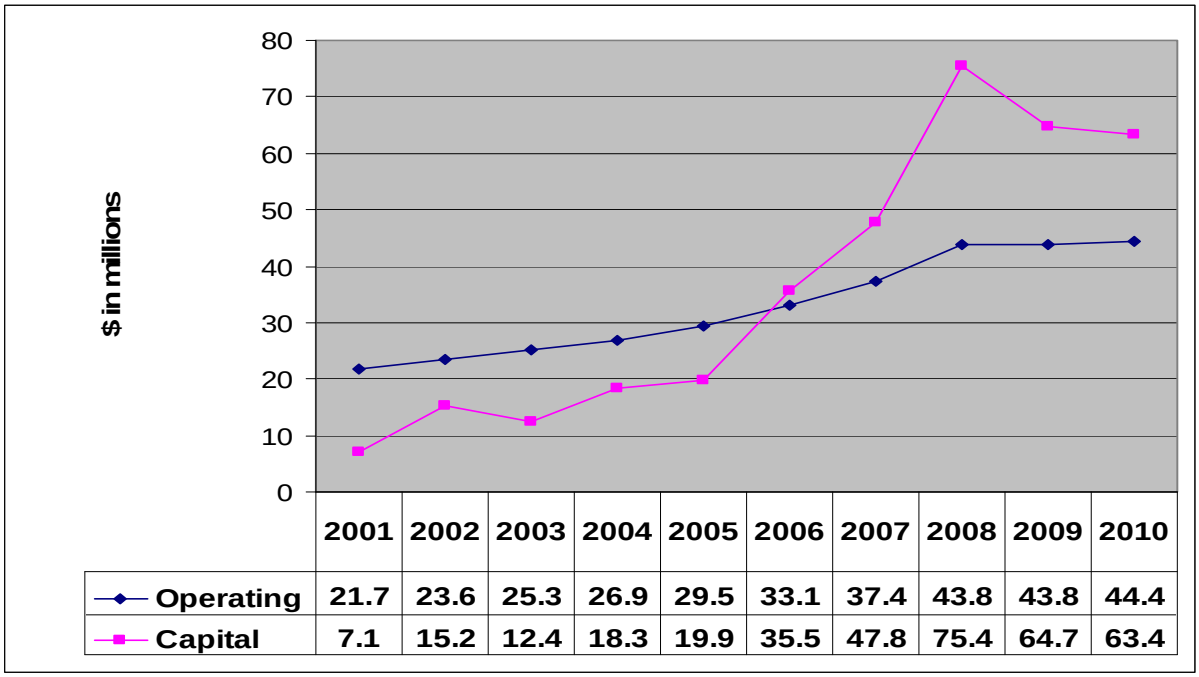
### 4.3.1. Parks Capital Program Growth

Capital budgets include both refurbishment and growth-type projects. Refurbishment projects revitalize existing assets and usually include some element of upgrading which can reduce operating costs. Growth-type capital projects increase park inventory and require increased operational funding.

The Parks capital budget program has grown exponentially over the last 10 years in relation to the linear growth of Parks operating budgets as shown in Figure 12. In 2001, the capital program was one-third of the operating budget. In 2010, the capital budget is almost one-and-half times larger than the operating budget.

In 2005, the City as a whole experienced rapid growth and the Parks capital budget grew as the need arose to develop more parks in new neighborhoods. Several large projects also added to this rapid growth such as Louise McKinney Park, and Fort Edmonton Foot Bridge.

Figure 12: Contrasting Parks Capital and Operating Budgets




| | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|---|---|---|---|---|
| Operating | 21.7 | 23.6 | 25.3 | 26.9 | 29.5 | 33.1 | 37.4 | 43.8 | 43.8 | 44.4 |
| Capital | 7.1 | 15.2 | 12.4 | 18.3 | 19.9 | 35.5 | 47.8 | 75.4 | 64.7 | 63.4 |

Source: 2001-2005 from approved operating and capital budgets, 2006-2009 from SAP financial detail, 2010 from the proposed 2009-2013 Capital Priorities Plan.

One of the four principles within the City's strategic plan "The Way Ahead" is Sustainability. The plan defines sustainability as: "***A way of living which meets the needs of the present and does not compromise the ability of future generations to meet their own needs.***" The plan further states that the "principle of sustainability" also includes financial sustainability; ensuring urban planning recognizes and addresses resource constraints and capacities. Through our operational review we observed strains on existing resources and, based on this level of capital resource deployment, we believe further strains on operating resources can be expected in future years.

### 4.3.2. Capital Budget Planning

We reviewed actual and budgeted expenditures for Parks capital programs. As shown in Table 10, Parks capital spend level was significantly below targeted levels set by the previous City Manager. Land acquisition and grant funding issues partially contribute to this condition however many other capital profiles were not completed as planned in capital budgets. We believe this highlights the need for the Parks Branch to recognize the limitations of their project management capacity.

Table 10: Parks Capital Budgets – (Figure in $ millions)

| 2006 | | 2007 | | 2008 | | 2009 | |
|---|---|---|---|---|---|---|---|
| **Budget** | ***Actual** | **Budget** | **Actual** | **Budget** | **Actual** | **Budget** | **Actual** |
| $35.5 | $19.1 | $47.8 | $31.6 | $75.4 | $38.0 | $64.7 | $47.7 |
| Spend Level** Target = 75% | | Spend Level Target = 75% | | Spend Level Target = 80% | | Spend Level Target = 80% | |

| | | | |
|---|---|---|---|
| Actual = 53.8% | Actual = 66.1% | Actual = 50.4% | Actual = 73.7% |

*Actuals include carry forward costs from previous years
** Spend Level Target as identified in City's year-end financial results.

The program budget variance shown above in Table 10 indicates that the Parks capital program is not being completed as approved. We discussed this program variance with Parks staff who identified several causes:

- Internal resources are not sufficient to complete current level of planned programs.
- Outside contractors have had limited capacity to meet Parks programs with minor improvement showing in 2009.
- Coordination and timing of grant funding has stalled many capital programs.
- Adapting to new project management systems has consumed project management resources.

The Parks Branch responded that they are currently in the process of coordinating its grant application process, moving positions internally to staff project planning, and improving project management systems in order to address these project management issues. The Branch is currently in the middle of implementing process and system changes such as PaCMan, Tangible Capital Assets, and POSSE. Once these new processes are fine tuned, they believe that they will improve the effectiveness in the delivery of capital projects.

### 4.3.3. Parks Capital Budget Profiles

We observed several Parks capital budget profiles with limited details on project descriptions and on expected quantities, which we believe is necessary for greater transparency and accountability.

The Parks capital program is the composition of numerous capital profiles, each representing projects approved by City Council. These capital profiles, in most cases, require multi-year funding and are either singular or composite in type. Singular capital profiles include only one project within the capital profile. Composite capital profiles include multiple capital projects of a similar nature within one capital profile. Individual capital profiles are assigned to Program Managers, who are responsible to complete these projects. The Parks Branch Manager is accountable for the management of the overall Parks capital program.

There were 37 capital profiles within the 2009 Parks capital program and we observed that approximately two-thirds of these were of the composite-type. We met with staff to gather details on all 2009 capital profiles and learned that these 37 capital profiles represented over 250 individual projects.

We reviewed a sample of Parks Branch capital project files and observed that these project files included technical requirements, work packages, and schedules which comply with the *Administrative Directive A1424A on Project Management for Projects* criteria. Shown in Table 11 are the four capital profiles we selected for further assessment.

Table 11: Capital Work Reviewed and Analyzed

| PPSS Number (Note Below) | Project Name / Descriptor on PPSS | Number Of Projects Within The PPSS | Approved Budget For 2009 | Year End Costs For 2009 |
|---|---|---|---|---|
| 09-28-8001 | NPDP / Outdoor Aquatic Amenities – Redevelopment (Composite Type) | 13 | $2,435,000 | $2,463,000 |
| 09-28-8500 | Playground Conservation (Composite Type) | 7 (+ rubber mats) | $314,000 | $256,000 |
| 09-28-9001 | Parks / Sports Fields Renewal (Composite Type) | 41 | $3,711,000 | $2,019,000 |
| 05-28-5252 | Replacement of Drought Damaged Trees (Single Type) | 1 contract for 1,228 trees | $1,610,000 | $1,169,000 |

**Note:** PPSS - Project Profile Summary Sheet

We experienced significant challenges in trying to locate information to support budget estimates for all capital profiles. Similarly we experienced significant challenges in determining actual year-to-date project costs. Both of the above issues point to the inadequacy and inaccuracy of management information systems for effective reporting of project management estimates and costs which are discussed later in this report.

We observed that composite projects, as currently presented to City Council for budgetary approval, do not have details that outline the individual projects that will be constructed. As a consequence of the lack of details in composite capital profiles, we found that it is difficult to determine if the approved capital scope of work was actually completed, or some element of what was planned in a given year was simply moved into the subsequent construction period. For example, one Capital Project (Neighborhood Park Development Program / Outdoor Aquatic Amenities – Redevelopment) is a composite project but the number and location of projects is not specifically stated in the capital budget profile.

Similarly, we also observed recent projects presented to City Council for budgetary approval that do not describe the quantity of work. For example, the 2002 Capital Project “Replacement of Drought Damaged Trees” identified that 4,000 trees would be replaced. In contrast, the 2005 Capital Project “Replacement of Drought Damaged Trees” did not identify the expected quantities of trees to be replaced.

In the absence of specific information in all capital profiles, such as specific projects and quantities of expected work, there is little accountability of the actual project outcomes when assessed against original expectations. We believe presenting additional detail on the individual projects within the capital profiles would also facilitate more meaningful decision-making and subsequent performance.

| Recommendation 3 | Management Response and Action Plan |
|---|---|
| The OCA recommends that the Parks Branch strengthen their Capital Budget (composite and single projects) planning process by promoting greater levels of transparency and accountability to City Council. This requires that:<br>• Composite type capital profiles include additional information to identify the actual projects being undertaken in a given year, and<br>• Expected quantities of work within all capital profiles are stated. | **Accepted**<br>**Action Plan:**<br>Parks Management will include additional information to identify actual projects being undertaken where Parks is the sole determinant of the projects to be constructed and where feasible. Some profiles deal with safety or legislated renovations/repairs that can emerge on an annual basis, i.e. cannot be planned on a 3 year basis. For those capital programs that are based on partnerships with external parties, as much information as can be determined in advance of the project year will be provided. At a minimum, the criteria for project acceptance and prioritization will be included. Where legislative and/or regulation changes or emerging issues require a change in the prioritization of parks funding of specific projects that will be reported to Council.<br><br>**Planned Implementation Date:**<br>December, 2011<br><br>**Responsible Party:** Parks Branch Manager |

### 4.3.4. Project Management Staffing

Within the Parks Branch, a Program Manager is assigned authority to each capital profile approved by City Council. In cases where the capital profile is quite large this responsibility can be shared with multiple Program Managers. Typically, Program Managers oversee project cost estimating, design requirements, and contract preparation for several projects. Program Managers are accountable for the capital profile budget and have the authority to move funds between projects within an assigned capital profile.

Project Leads report to Program Managers and help plan and execute projects. They are expected to deliver assigned projects on budget, on time, and to expected quality standards. Project Leads communicate expected results and ensure that performance is meeting project specifications.

Within the Parks capital program we observed several instances where the assigned Program Manager also acts as the Project Lead and thereby both plan and execute all project activities. Proper segregation of duties is an important control in reducing the potential for staff work overload which we observed during this audit. Staff work overload can result in the lack of due diligence being made in key financial decisions and also places the health of City staff at risk.

During this audit we conducted a financial review of expenditures and observed a significant variation in the workload and overtime of staff that have similar duties within the Construction area of the Parks Branch. Table 12 illustrates these variations.

Table 12: Parks Construction Staff Overtime (2009)

| Position Title | Number of Staff With Identical Position Title | Range in Overtime Dollars |
|---|---|---|
| • Project Managers | 12 | $0 to $65,400 |
| • Parks Leaders | 6 | $8,800 to $38,500 |
| • Other Positions | 8 | $0 to $41,600 |

We observed that there were 11 employees in the Parks Branch that made in excess of $20,000 for overtime during 2009. Cumulatively, in 2009 these 11 employees earned $351,978 in overtime. The top earner had overtime earnings of $65,400. To put it into perspective, this translates to the equivalent of an additional 20 hours of overtime work, for each and every week over a period of eight months.

Overall, these results indicate that workloads are not adequately distributed within the project management area. We observed several Program Managers within the Branch with little or no overtime and others with excessive overtime as shown. This observation also brings to light that even with excessive overtime amounts, the Parks capital program is not being completed as planned. Excessive work overload contributes to an increased financial risk and the risk to the health and safety of staff. Therefore, we believe a detailed review of workloads and use of overtime within the Parks Branch is required.

| Recommendation 4 | Management Response and Action Plan |
|---|---|
| The OCA recommends that the Parks Branch review current workload distributions within the capital program area (i.e., Planning, Design and Construction units) to ensure effective resource planning and overtime usage. | **Accepted**<br>**Action Plan:**<br>Parks Management is in the midst of completing a number of process changes and financial planning that began in 2009 and continued into early 2010 that are scheduled to be implemented this year. This will lead to improved resource and project planning that will help to level resource usage (including overtime) in Parks Design and Construction. Development and training of new staff is currently underway; but is anticipated to be over more than one season for higher risk projects for parks development and in consideration of the seasonal nature of the work. In addition, once the 13 school/park sites for new schools are completed by the end of 2010, resource demand on our team should be more balanced to planning, design and construction specialized new park units.<br><br>**Planned Implementation Date:**<br>April, 2011<br>**Responsible Party:** Parks Branch Manager |

### 4.3.5. Management Information Reports

Management information reports are important to monitor performance and facilitate decisions for both operating and capital programs. During this audit we worked closely with Parks staff in understanding their information reporting tools. The City has invested considerable resources into the use of the PacMan (**P**roject **a**nd **C**ontract **Man**agement) system as a tool to facilitate project management. This corporate system has been in operation since October 2007.

We observed that current reports from PaCMan do not serve the information requirements well for either the Program Manager or the Project Lead. We found that there is not a single reporting source to obtain accurate and complete cost information regarding the capital program; a source that all staff could rely on and use as required. Staff suggested that there are many reasons for the lack of good reporting such as misaligned business processes, lack of training, and inaccurate information. Because information is required to manage capital projects in an effective and timely manner, staff rely on numerous work-around systems. Specific examples we observed included:

- Access databases were created in 2009 to produce quarterly summaries of capital profile and project results. This custom report is generated from the Access

Database tool that Parks has recently introduced as an interim measure until a POSSE / SAP integration pass-off is fully operational.

- Many staff have developed their own spreadsheets. In one particular case, the Excel file shared with us was so large (i.e., 445 rows X 105 columns) so as to, in our opinion, limit the usefulness and effectiveness in managing a project.

The use of work-around systems, such as Access and Excel, introduce new risks such as keying errors, system security, and data back-up since these are stand-alone systems. We do not believe these are acceptable tools to manage multi-million dollar capital projects given the City's significant investment in corporate systems such as PacMan and POSSE.

We learned that the Parks Branch has initiated a review of their integrated system requirements. The Parks Branch and the Information Technology Branch have partnered and have completed an assessment of business requirements for an integrated system. POSSE has been selected as the future end-to-end work flow process software.

We also observed there is inconsistent knowledge amongst staff regarding the extent of available reports. We observed that Project Managers and Project Leads do not have an easy way of knowing who is actually charging time and costs to their assigned projects (either as regular time or possibly as overtime). Also, we noted in a project SAP report, total costs exceeded the budget and that there were other expenditures not within the intended project scope.

In conclusion, we believe the Parks Branch needs to resolve the ongoing issues and challenges surrounding the availability of key financial reports to assist Program Managers in managing their respective capital projects effectively and efficiently.

| Recommendation 5 | Management Response and Action Plan |
|---|---|
| The OCA recommends that the Parks Branch identify and produce a limited number of key project costing reports and that all required users of these reports receive sufficient training to use these project management reporting tools effectively. | **Accepted**<br>**Action Plan:**<br>Parks Management agrees with the recommendation and will work with Corporate Finance and IT to improve reporting and oversight for project costing and to access appropriate and timely training for staff.<br>**Planned Implementation Date:**<br>June, 2011<br>**Responsible Party:** Parks Branch Manager |

# 5. Conclusion

During this audit we assessed whether resources are used efficiently and effectively in the management of the City's urban forest and in the delivery of capital projects.

**Management of the Urban Forest**

We learned that the City's urban forest is currently challenged by ongoing drought conditions and recent wind storms. The Parks Branch has completed an inventory of trees and a tree health assessment in order to monitor this risk to the urban forest.

We compared the unit costs of contract tree pruning to that of in-house tree pruning and found that costs were comparable and therefore appear to be conducted in a cost efficient manner. However, tree pruning work assigned to in-house staff was not completed as planned in contrast to contract tree pruning which was completed as planned. We learned that in-house resources were shifted to other activities such as tree and stump removal, contract watering, and tree planting. The reduction of tree pruning maintenance signals that the Parks Branch is operating in a reactionary mode, which may have a negative long-term impact on the health of the urban forest.

We reviewed tree planting activity and observed that in-house unit costs were much lower than contracted tree planting costs. In 2009 in-house direct tree planting costs were $743 per tree compared to contracted costs of $1,136 per tree. We also reviewed the three-year capital project for the replacement of drought damaged trees and observed that significantly fewer trees were replaced than originally planned.

We observed a high level of risk awareness of current and emerging risks in the Pest Management area and that they have taken proactive steps to managing risks to the urban forest. Pest Management is highly engaged internally within the Parks Branch and also with numerous outside organizations in the detection and monitoring of risks to the urban forest.

**Delivery of Capital Projects**

We also assessed whether resources are being used effectively and efficiently in the delivery of capital construction projects. In our assessment, we reviewed the capital budget planning process, planned and actual capital expenditures, and a sample of capital projects.

We observed that the planned Parks capital budgets have grown exponentially since 2005 and also observed that the actual capital spending is significantly below planned levels from 2006 to 2009. We also observed that several capital profiles are lacking in detailed information which is needed for greater transparency and accountability.

We reviewed the project files of four capital profiles and observed that these projects met the requirements of the City's administrative directive on project management. We observed a blending of roles within the capital project area between Project Managers and Project Leads which we believe decreases accountability and increases the financial risk of projects. We observed that the work load between staff within the

project management area appears unbalanced as exhibited by excessive overtime of some staff and relatively little by others. Additionally, we observed that current management information reports did not serve staff well in their requirement to manage projects and that work around systems have been developed to meet their needs.

We acknowledge and thank Parks Branch staff for their efforts and openness during this audit.