CITY OF NANAIMO

BUSINESS CASE – Corporate Asset Management System (CAMS)

CURRENT OVERVIEW
Through a process known as *Asset Management*, the City of Nanaimo manages nearly $3 billion worth of infrastructure. This includes roads, water and sewer pipes, facilities, buildings, parks and trails, and many other assets used by the community every day. Asset management is the process of making decisions about this infrastructure in a responsible manner. It is about considering the needs of current and future residents, identifying the risks in meeting those needs, and making the best use of limited resources to ensure sustainable service delivery. The City projects to invest $1.1 billion over the next 20 years in maintaining and expanding City infrastructure.

The *20 Year Investment Plan and Asset Management Update* and the *Core Services Review* both identify a CAMS (formerly described as a Computerized Maintenance Management System) as one of the next step in enhancing the City's asset management capabilities. A CAMS or Corporate Asset Management System is an expandable computer system with functions that include:

- Automating maintenance scheduling
- Managing work orders,
- Maintaining asset tracking database
- Life-cycle planning and analysis
- Multiple maintenance method monitoring
- Workflow analysis

BUSINESS ISSUE
Currently department's use a variety of software/systems to generate work orders and track condition and maintenance information, there is no single source for information.

The City's main software for generating work orders is the TEMPEST Calls for Service system. TEMPEST Calls for Service system ties work orders to the nearest civic address of the subject asset rather than linking the work order to the specific asset stored in the City's geographic information system (GIS) asset inventory. This means when looking up or reviewing the historical maintenance information of a specific asset, staff must access a wide variety of paper-based records, emails and Excel worksheets rather than a go to a single source of information.

Existing business processes are largely manual, using Excel, paper and limited datasets. This has resulted in the following operational challenges:

- Incomplete information for
    - Asset inventory
    - Asset documentation
    - Condition reporting
    - Maintenance history

- Risk of loss of institutional knowledge through staff turnover
  - Lost opportunity to increase organizational knowledge with every work order completed
- Difficult to determine costs for maintaining individual assets
- Maintenance tends to be more reactive than proactive
  - This can reduce asset life expectancy
  - Negatively impacts service levels
  - Cause interruptions to daily workflow and negatively impact citizens
  - Diverts resources from maintenance and operations
- Long term asset decisions may be made with incomplete information on inventory and condition of assets, which can impede the communications of risk
- No mechanism to improve asset inventory information through field tools
  - Operational staff are carrying paper work orders to the field with no way to update or enter details about their work
- More than 14,000 service requests a year for public works, parks and facilities are not being tied to the specific assets
- Service requests being tied to assets in separate systems:
  - Approximately 7,000 a year in signs, streetlights and trees
  - Approximately 4,000 a year in fleet
- Unknown number of other services requests are not being tracked at all
- Challenge to sufficiently convey a holistic picture of risk to the public and Council

EXPECTED OUTCOME

In determining the need for a CAMS, the City assessed its current mode of operation. Key questions that were brought forward as part of that assessment included:

- How do we assess and record condition of assets?
- Do we have an effective way to generate and track work orders? How do we verify the work was done efficiently and correctly? What is the notification function upon completion?
- Are we able to efficiently access historical information on the last time a system was serviced, by whom, and for what condition?
- How are our spare-parts inventories managed and controlled? Either do we have excess inventories or are we consistently waiting for parts to arrive?
- Do we have an organized system to store documents (electronically) related to operations and maintenance (O&M) procedures, equipment manuals and warranty information?
- When service staff are in the field what assurances do, we have that they are compliant with all life, health and safety issues (e.g., lock and tag) and are using the right tools/equipment for the task?
- How are our assets, i.e., equipment and systems, tracked for reporting and planning?
- How do we record the risk of failure associated with assets?

In response to the CAMS needs assessment, the City recently completed a Request for Information (RFI) process. Eight software vendors submitted information about their solutions and three provided live demonstrations. Approximately 20 staff members from various departments participated in the RFI process. The purpose of the RFI was to:

- Gain a further understanding of how existing commercially available software could allow the City to better manage the assets it manages on behalf of the public;
- Develop the functional specifications and requirements of the CAMS software; and
- Gather order of magnitude costing to inform CAMS system implementation project budgeting activities.

At the conclusion of the RFI process, staff feedback was collected and tabulated. It was clear from the comments submitted that having a CAMS could significantly improve the processes that the City uses to manage physical assets across the City. It was also clear that a lack of a CAMS is impeding productivity.

The implementation of a CAMS is expected to result in the achievement of the following business objectives:

- Central repository for all asset documentation
    - Including
        - Maintenance
        - Warranty
        - Safety
- Lower reactive maintenance costs
- Reduce unplanned downtime
- Increase operational efficiency
- Field capture of asset information
- Prompt time and resources tracking
- Ability to establish performance metrics for improved decision making
- Fully realized lifecycle costs of assets
- Improve the quality of the information that informs the 20 year asset management plan
- Better project prioritization
- Proactive preventive maintenance, leading to extended infrastructure life

OPTIONS
Option #1 – Undertake a phased approach for implement of a CAMS. Implementation in four phases with Phase 1 structured as a pilot project.

Major Deliverables and Suggested Timelines:

2021 - Q1	• Release an RFP for a corporate asset management system
2021 – Q2	• RFP evaluation
2021 – Q3/Q4 – Phase 1 (6 months)	• Pilot – Sewer
2022 – whole year – Phase 2 (12 months)	• Review Pilot Project • Incorporate Lessons Learned • Dam Inspections • Water • Storm • Develop GIS needs for other groups
2023- 2024-Q2 - Phase 3 (18 months)	• Transportation • Integration with ERP across the City– Iterative Process • Citizen requests for service changes
2024 Q3 – 2026- Phase 4 (30 months)	• Parks • Facilities Financial optimization tools to be used on the data collected from the corporate asset management system.

Relevant assets for CAMS implementation:

- Transportation – roads including pavement & pavement marking, bridges & culverts, driveway culverts, ditches, sidewalks, traffic signals, streetlights, fences
- Water - dams, water treatment plant, mains, pump stations, hydrants, PRV stations, services to properties
- Sewer - mains, pump stations, services to the properties
- Stormwater – mains, culverts, detention ponds
- Transit - bus stops, bus shelters
- Sanitation – cemeteries, road cleaning
- Fleet - light duty vehicles, heavy equipment
- Buildings and Facilities - building structure, electrical, mechanical, HVAC and facility amenities
- Parks and Park Amenities – play equipment, bridges, trails, park street lights
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Key Success Factors:

- Corporate buy-in
- Well defined department roles and commitments
- Project Staff for implementation and long term support
- Staff training for end users

Recommended Project Team Structure:

Executive Project Sponsors - GM Engineering & Public Works, GM Parks, Recreation and Culture, GM Corporate Services
Vendor Implementation Consultant - as appropriate
City IT Project Manager - 4 year TFT Senior Applications Analyst
Primary Technical Resource - PFT Senior Applications Analyst
Secondary Technical Resource
Business Analyst
Report Builder
GIS Support – PFT GIS Technologist
Business advisor

Benefits:

- Ability to effectively communicate infrastructure risks and investment trade-off decisions to Council
- Ability to schedule predictive and preventive maintenance
- Centralize all physical assets, inspection records and latest condition reports
- Increase the utilization of existing assets and reduction in the acquisition of new assets by performing timely maintenance to extend the assets lifespan
- Improved efficiency for operational teams
  - o Access to resource materials
  - o Improved dispatching based on location knowledge and real-time updates
- Increased protection of critical data by creating a central data repository for asset condition and maintenance records
- Real-time collection of field data
- Provide more complete data for decision making and reporting
- Reducing the operational knowledge loss from staff turnover
- Migrating from reactive to proactive maintenance
- Provide a real-time view of City operations
- Integrate with the City's financial system to better track the total costs of owning, maintain and repairing assets (projected for 2024)

Weaknesses:
- Significant project costs and increase to on-going annual operating budgets; however it is anticipated there will be cost savings as a result of increased efficiency and ability to plan more effectively (these savings can not be quantified).
- The project will require retraining of field personnel that work with physical assets, many are supportive and interested in modernizing their work flow.
- Lack of adoption by any individual group would prevent the capture of that groups asset maintenance and condition information.

Financial Analysis:
See appendix A for breakdown of projected project costs and projected annual on-going operating costs.

- Phases 1 – 4 (Years 1 – 4) are projected to cost $2.8M. Annual operating costs starting in year 5 are projected at $450,900 annually.

Future anticipated costs not shown in appendix include:
- Major upgrade to software - It is anticipate that every 6 – 10 years a major upgrade would be required. Consulting fees for implementation of upgrade are estimated at $40,000 (2019 pricing).
- Replacement of tablets – Every 4 – 5 years approx. 60 tablets will need to be replaced at an estimated cost of $72,000.

Option #2 – Status Quo
Continue using the TEMPEST Calls for Service and other stand-alone systems to generate work orders and track maintenance costs.

Benefits:
- No impact to operating budgets

Weaknesses:
- Continued reactive maintenance and limited opportunity to find further efficiency.
- No single source of information for City assets.
- Long term asset decisions may be made with incomplete information on inventory and condition of assets, which can impede the communication of risk.
- Business processes for tracking asset condition and maintenance will remain largely manual, using Excel, paper and limited datasets.
- Continued risk of a loss of organizational knowledge with the retirement of field staff, who have no consistent method to store their asset maintenance and condition knowledge.
- Risk of losing ability to track regulatory signage condition and maintenance information, which is currently stored in a 12 year old, end of life custom application with no migration path to a supported platform.

RECOMMENDATION
Option #1 Implementation of a CAMS

Appendix A: Financial Analysis

	2021	2022	2023	2024	2025 - onward	Project Type	Possible Funding Source
Project Costs							
Equipment/Software Purchases							
Mobility - Tablets[1]							
Phase 1 - 10 units	12,000	-	-	-	-	IO	Property Taxation
Phase 2 - 8 units	-	9,600	-	-	-	IO	Property Taxation
Phase 3 - 40 units	-	-	48,000	-	-	IO	Property Taxation
Office equipment							
Workstation - 2	4,000	-	-	-	-	IO	Property Taxation
Computer/Laptop - 2	6,300	2,600	-	-	-	IO	Property Taxation
Mobile and Desk Phones - 2	2,500	-	-	-	-	IO	Property Taxation
Facilities (Creation of workspace)	12,000	-	-	-	-	IO	Property Taxation
Contingency - 10%	3,700	1,200	4,800	-	-	IO	Property Taxation
Subtotal Equipment/Software Purchases	**$ 40,500**	**$ 13,400**	**$ 52,800**	**$ -**	**$ -**		
Implementation							
Implementation Consultant	200,000	200,000	-	-	-	Capital	Community Works
License / Maintenance Annual	150,000	-	-	-	-	Capital	Community Works
Phase 1 (pilot) Sewer							
Site Visits to Reference Installations	5,000	7,000	-	-	-	Capital	Community Works
Labour[2]							
PFT - Senior Applications Analyst	109,900	112,100	114,400	116,700	-	Capital	Community Works
TFT - Senior Applications Analyst	109,900	112,100	114,400	116,700	-	Capital	Community Works
PFT - GIS Technologist	92,400	94,300	96,100	100,000	-	Capital	Community Works
Employee Expenses	11,800	11,500	12,200	12,000	-	Capital	Community Works
Contingency (excludes labour) - 10%	67,900	53,700	37,400	36,400	-	Capital	Community Works/Property Taxation
Phase 2 - Dam Inspections, Water, Storm							
Phase 3 - Transportation, ERP Integration, Citizen Requests							
User Groups Development Support	-	-	26,700	13,300	-	Capital	Property Taxation
User Group Allocation - Finance	-	-	10,100	5,000	-	Capital	Property Taxation
Phase 4 - Parks, Facilities, Asset Optimization tools							
Subtotal Implementation	**$ 746,900**	**$ 590,700**	**$ 411,300**	**$ 400,100**	**$ -**		
Total - Project Costs	**$ 787,400**	**$ 604,100**	**$ 464,100**	**$ 400,100**			
On Going Operating Costs							
PFT - Senior Applications Analyst					119,000	n/a	Property Taxation
PFT - GIS Technologist					100,000	n/a	Property Taxation
Employment Expenses					8,600	n/a	Property Taxation
License / Maintenance Annual Fees		150,000	150,000	150,000	150,000	n/a	Property Taxation
Mobility - Data Fees		3,600	5,400	19,800	19,800	n/a	Property Taxation
Mobile Device Management			12,500	12,500	12,500	n/a	Property Taxation
Contingency (excludes labour) - 10%		15,400	16,800	18,200	41,000	n/a	Property Taxation
Total - On Going Operating Costs	**$ -**	**$ 169,000**	**$ 184,700**	**$ 200,500**	**$450,900**		
Grand Total - All Cost	**$ 787,400**	**$ 773,100**	**$ 648,800**	**$ 600,600**	**$450,900**		

[1] Alternative - minimize costs by using existing City issued smartphones instead of tablets. Tablets would need to be replaced every 4-5 years.

[2] Three new positions created for first four years during implementation, two positions will remain after implementation is complete to support operations of system

Rounded to nearest $100