#### EXTRACT FROM COUNCIL MEETING MINUTES OF JUNE 7, 2016

Item 8, Report No. 26, of the Committee of the Whole (Working Session), which was adopted without amendment by the Council of the City of Vaughan on June 7, 2016.

#### 8 LED STREET LIGHT RETROFIT STUDY: BUSINESS CASE & FINANCING ALTERNATIVES <u>ALL WARDS</u>

The Committee of the Whole (Working Session) recommends approval of the recommendation contained in the following report of the Deputy City Manager of Public Works and the Director of Transportation Services, Parks and Forestry Operations, dated June 1, 2016:

#### Recommendation

The Deputy City Manager of Public Works and the Director of Transportation Services, Parks and Forestry Operations, in consultation with the Director of Infrastructure Delivery, Director of Financial Planning and Development Finance and Deputy City Treasurer, Director of Development Engineering and Infrastructure Planning, and the Director of Policy Planning and Environmental Sustainability recommend:

- That Staff proceed with the procurement process for an Energy Performance Contract for the City-wide LED street light retrofit project for a contract term of 18 years (3 years for the design and installation, 15 years for the operation and maintenance), with upfront capital costs for the design and installation to be debt-financed subject to further financial analysis by staff to determine the appropriate debt-financing option;
- 2. That Staff conduct further financial analysis to determine the appropriate debt-financing option for the upfront capital costs associated with the design and installation of the Energy Performance Contract and report back with a recommendation to a future Finance, Administration and Audit Committee meeting during the 2017 budget process and prior to the award recommendation to Council; and
- 3. That Staff retain the advisory services required to lead the procurement of the Energy Performance Contract, to be funded through existing Capital Project RP-2058-15.

#### Contribution to Sustainability

This report contributes to the goals and objectives within the Green Directions Vaughan, the City's Community Sustainability Environmental Master Plan, specifically:

Goal 1: To significantly reduce our use of natural resources and the amount of waste we generate.

Objective 1.1: To reduce greenhouse gas emissions and move towards carbon neutrality for the City of Vaughan's facilities and infrastructure.

Goal 3: To ensure that Vaughan is a city that is easy to get around with a low environmental impact.

Objective 3.2: To develop and sustain a network of roads that supports efficient and accessible public and private transit

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#### **Economic Impact**

The financial figures included in this report are estimations based on the financial analysis conducted by Espirito Corp. in the LED Street Light Retrofit Study: Business Case & Financing Alternatives (Executive Summary is included in Attachment No. 1). Through the procurement of the Energy Performance Contract, precise financial figures will be identified and confirmed at the time of award by Council.

The estimated total nominal cost for the LED street light retrofit project Energy Performance Contract, including design, installation, operation and maintenance of the project, is \$32M over the full contract term of 18 years (i.e. 3 year design and installation and 15 year operation and maintenance). This includes an estimated upfront capital costs for the design and installation of the retrofit project of \$19.1M.

The estimated total costs of the retrofit project (including the \$19.1M debt-financing for upfront capital costs for the design and installation), will be fully offset from future energy and maintenance savings (energy savings guaranteed by the Energy Services Company), resulting from the retrofit project. No negative impact to taxation is anticipated. Staff will conduct further financial analysis to determine the appropriate debt-financing option for the upfront capital costs and report back with a recommendation to a future Finance, Administration and Audit Committee meeting during the 2017 budget process and prior to the award recommendation to Council.

Nominal savings resulting from the retrofit project are estimated to be \$33.8M for energy savings and \$7.7M for maintenance savings over the full contract term. It is estimated that an additional cashflow of \$9.5M over contract term will result from the future energy and maintenance savings above the total project costs.

#### **Communications Plan**

Pending Council's endorsement of the report's recommendations, a comprehensive communications plan will be developed to keep resident's informed of the future phases of the LED street light retrofit project.

#### Purpose 1 -

The purpose of this report is to provide Council with the results of the LED Street Light Retrofit Study: Business Case & Financing Alternatives, completed by Espirito Corp., and to recommend next steps required for pursuing the retrofit project.

#### **Background - Analysis and Options**

In 2014, Council endorsed the City's Energy Conservation and Demand Management Plan, which directed Staff to "explore the feasibility of a large scale LED street light retrofit" by "preparing a business case including financing alternatives for the retrofit program".

In 2014, the City's Energy and Conservation Demand Management Plan recognized the significant reduction in energy consumption and savings in operating and maintenance costs that would likely result from a City-wide LED street light retrofit project; however, it also was cognizant of the high capital costs associated with such a retrofit project.

As a result, it noted that additional analysis was required through the preparation of a business case to support the retrofit project and the evaluation of alternative financing arrangements, including energy performance contracting, prior to any decision to proceed with the retrofit project.

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Ultimately, the purpose of the LED Street Light Retrofit Study: Business Case & Financing Alternatives was to demonstrate a sound financial basis for a City-wide LED street light retrofit project, by:

- Calculating the total cost to retrofit the City's approximately 24,000 street lights with LED technology and possibly adaptive controls;
- Calculating the lifecycle cost-savings and future energy and maintenance savings to be realized from the LED street light retrofit;
- Recommending a financing strategy for a large scale LED street light retrofit that compares the value for money of different financing alternatives, and
- Recommending the next steps for financing and procuring a LED street light retrofit.

# Through a competitive Request for Proposal process completed in 2015, Espirito Corp. was retained to work with the City's technical and financial project team to complete the LED Street Light Retrofit Study: Business Case & Financing Alternatives from January to April 2016.

Espirito Corp. has worked with the City's internal technical and financial project team, with representation from Transportation Services, Parks and Forestry Operations, Infrastructure Delivery, Financial Planning and Development Finance, Development Engineering and Infrastructure Planning, and Environmental Sustainability.

In completion of the study, a rigorous stepped process has been conducted, including:

- Project Screening
- Technical Analysis
- Energy Analysis
- Risk Analysis
- Value for Money Analysis
- Next Steps

The Executive Summary of the LED Street Light Retrofit Study: Business Case & Financing Alternatives, which details each step of the study identified above and the results of the study, is appended as Attachment No. 1.

### There is a compelling business case for the City-wide LED street light retrofit project and it is recommended that the City pursues the retrofit project through an Energy Performance Contract.

Through completion of the LED Street Light Retrofit Study: Business Case & Financing Alternatives, it is recommended that the City pursues an Energy Performance Contract to deliver the LED street light retrofit project. In an Energy Performance Contract deal structure, the City, through a competitive procurement process, would contract with a private sector Energy Service Company (ESCO) to design and install the LED street light retrofit project and to operate and maintain all of the street lights over a defined contract term.

To fund the retrofit project, debt-financing is required for the upfront capital costs associated with the design and installation. Staff will conduct further financial analysis to determine the appropriate debt-financing option for the upfront capital costs and report back with a recommendation to a future Finance, Administration and Audit Committee meeting during the 2017 budget process and prior to the award recommendation to Council. Under the Energy Performance Contract, the ESCO is required to guarantee the energy savings resulting from the LED street light retrofit directly to the City through the contract structure, as it is the future energy

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and maintenance savings that the City will use to pay the debt stream. The City will deploy the future energy and maintenance savings to pay-off the debt raised for the design and installation, as well as the operating and maintenance costs over the duration of the contract. Under this model, neither the design and installation costs nor the operation and maintenance costs will be funded through additional taxes. In addition to paying for the project, there is an additional cashflow to the City, resulting from the future energy and maintenance savings above the total project costs.

It has been determined that an Energy Performance Contract is the ideal delivery model for the LED street light retrofit project and has projected a significant reduction in energy consumption and savings in operating and maintenance costs. It has also determined that the overall value for money is greater for an Energy Performance Contract delivery model, compared to delivering the project through the Traditional or in-house (i.e. Design Bid Build) procurement model. A summary of the recommended Energy Performance Contract for the City's LED Street Light retrofit project is outlined below:

- Contract term of 18 years (i.e. 3 year design and installation and 15 year operation and maintenance).
- Total nominal cost for the project of \$32M over the full contract term, including adaptive controls (\$19.1M costs for design and installation to be debt-financed).
- Total nominal energy savings of \$33.8M over the full contract term.
- Total nominal maintenance savings of \$7.7M over the full contract term.
- Additional cashflow to the City of \$9.5M over contract term, resulting from the future energy and maintenance savings above the total project costs.
- Overall value for money of 35% or \$14.7M potential savings, compared to the City delivering project through the Traditional or in-house (i.e. Design Bid build) procurement model.
- Reduction in street light energy usage by 61%.

Given the estimated energy and maintenance savings of the LED street light retrofit project and the estimated value for money of delivering the LED street light retrofit project through an Energy Performance Contract, it is recommended that Staff proceeds with the procurement of an Energy Performance Contract.

Due to the value of the LED street light retrofit project and that an Energy Performance Contract is specialized in nature, it is further recommended that the City obtain the specialist project management, technical and financial advisory services required to lead this procurement, as well as the retention of an independent Fairness Advisor.

The recommended project timeline, including activities and durations, has been developed in the LED Street Light Retrofit Study: Business Case & Financing Alternatives, with an anticipated commencement of installations for Q2 2017. Pending Council's endorsement of the recommendations contained in this report, Staff will use this project timeline as a road map for delivery of the retrofit project.

#### Relationship to the 2014-2018 Term of Council Service Excellence Strategy Map

The recommendations contained in this report support the following Term of Council Priorities:

- Improve municipal road network
- Invest, renew and manage infrastructure and assets
- Continue to ensure the safety and well-being of citizens
- Meet Council tax rate targets (no greater than 3%)
- Continue to cultivate and environmentally sustainable City

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- Citizen experience and service delivery
- End-to-end citizen centered services
- Service delivery options
- Financial sustainability

#### **Regional Implications**

The City operates and maintains the street lights on Regional roads, while York Region operates and maintains the street lights at Regional intersections. To ensure consistency in the City's road network and promote collaboration in the provision of street lighting services, the City has engaged York Region and provided them with the opportunity to join the project in partnership. York Region has not decided on whether it intends to be integrated with the City's project at this time.

The City will continue to consult with York Region on this project to determine potential interest in taking part in the City's retrofit project.

#### **Conclusion**

In response to the City's Energy Conservation and Demand Management Plan, endorsed by Council in 2014, the City retained Espirito Corp. to complete the LED Street Light Study: Business Case & Financing Alternatives for a large scale, City-wide LED street light retrofit project.

As a result of the LED Street Light Study: Business Case & Financing Alternatives, this report recommends that Staff proceed with the procurement process for an Energy Performance Contract for the City-wide LED street light retrofit project due to the estimated energy and maintenance savings of the LED street light retrofit project and the estimated value for money of delivering the LED street light retrofit project through an Energy Performance Contract.

Pending Council's endorsement of the report's recommendations, Staff will retain the necessary external advisory services required to lead the procurement of the Energy Performance Contract.

Staff will conduct further financial analysis to determine the appropriate debt-financing option for the upfront capital costs and report back with a recommendation to a future Finance, Administration and Audit Committee meeting during the 2017 budget process and prior to the award recommendation to Council.

#### **Attachment**

1. LED Street Light Retrofit Study: Business Case & Financing Alternatives – Executive Summary

#### Report prepared by:

Adam Payler, Business Analyst, TSPFO Shawn McKenzie, Senior Engineering Assistant, TSPFO. Vince Musacchio, Manager of Infrastructure Planning, Infrastructure Delivery Wynkie Ha Hau, Senior Financial Analyst, Financial Planning and Development Finance Andy Lee, Environmental Engineer, Development Engineering and Infrastructure Planning Tony Iacobelli, Manager of Environmental Sustainability, Environmental Sustainability Kailyn Smith, Sustainability Coordinator, Environmental Sustainability

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

#### COMMITTEE OF THE WHOLE (WORKING SESSION) JUNE 1, 2016

#### LED STREET LIGHT RETROFIT STUDY: BUSINESS CASE & FINANCING ALTERNATIVES ALL WARDS

#### Recommendation

The Deputy City Manager of Public Works and the Director of Transportation Services, Parks and Forestry Operations, in consultation with the Director of Infrastructure Delivery, Director of Financial Planning and Development Finance and Deputy City Treasurer, Director of Development Engineering and Infrastructure Planning, and the Director of Policy Planning and Environmental Sustainability recommend:

- That Staff proceed with the procurement process for an Energy Performance Contract for the City-wide LED street light retrofit project for a contract term of 18 years (3 years for the design and installation, 15 years for the operation and maintenance), with upfront capital costs for the design and installation to be debt-financed subject to further financial analysis by staff to determine the appropriate debt-financing option;
- 2. That Staff conduct further financial analysis to determine the appropriate debt-financing option for the upfront capital costs associated with the design and installation of the Energy Performance Contract and report back with a recommendation to a future Finance, Administration and Audit Committee meeting during the 2017 budget process and prior to the award recommendation to Council; and
- 3. That Staff retain the advisory services required to lead the procurement of the Energy Performance Contract, to be funded through existing Capital Project RP-2058-15.

#### **Contribution to Sustainability**

This report contributes to the goals and objectives within the Green Directions Vaughan, the City's Community Sustainability Environmental Master Plan, specifically:

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#### Economic Impact

The financial figures included in this report are estimations based on the financial analysis conducted by Espirito Corp. in the LED Street Light Retrofit Study: Business Case & Financing Alternatives (Executive Summary is included in Attachment No. 1). Through the procurement of the Energy Performance Contract, precise financial figures will be identified and confirmed at the time of award by Council.

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the full contract term of 18 years (i.e. 3 year design and installation and 15 year operation and maintenance). This includes an estimated upfront capital costs for the design and installation of the retrofit project of \$19.1M.

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#### **Communications Plan**

Pending Council's endorsement of the report's recommendations, a comprehensive communications plan will be developed to keep resident's informed of the future phases of the LED street light retrofit project.

#### Purpose

The purpose of this report is to provide Council with the results of the LED Street Light Retrofit Study: Business Case & Financing Alternatives, completed by Espirito Corp., and to recommend next steps required for pursuing the retrofit project.

#### **Background - Analysis and Options**

In 2014, Council endorsed the City's Energy Conservation and Demand Management Plan, which directed Staff to "explore the feasibility of a large scale LED street light retrofit" by "preparing a business case including financing alternatives for the retrofit program".

In 2014, the City's Energy and Conservation Demand Management Plan recognized the significant reduction in energy consumption and savings in operating and maintenance costs that would likely result from a City-wide LED street light retrofit project; however, it also was cognizant of the high capital costs associated with such a retrofit project.

As a result, it noted that additional analysis was required through the preparation of a business case to support the retrofit project and the evaluation of alternative financing arrangements, including energy performance contracting, prior to any decision to proceed with the retrofit project.

Ultimately, the purpose of the LED Street Light Retrofit Study: Business Case & Financing Alternatives was to demonstrate a sound financial basis for a City-wide LED street light retrofit project, by:

- Calculating the total cost to retrofit the City's approximately 24,000 street lights with LED technology and possibly adaptive controls;
- Calculating the lifecycle cost-savings and future energy and maintenance savings to be realized from the LED street light retrofit;
- Recommending a financing strategy for a large scale LED street light retrofit that compares the value for money of different financing alternatives, and
- Recommending the next steps for financing and procuring a LED street light retrofit.

Through a competitive Request for Proposal process completed in 2015, Espirito Corp. was retained to work with the City's technical and financial project team to complete the LED Street Light Retrofit Study: Business Case & Financing Alternatives from January to April 2016.

Espirito Corp. has worked with the City's internal technical and financial project team, with representation from Transportation Services, Parks and Forestry Operations, Infrastructure Delivery, Financial Planning and Development Finance, Development Engineering and Infrastructure Planning, and Environmental Sustainability.

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To fund the retrofit project, debt-financing is required for the upfront capital costs associated with the design and installation. Staff will conduct further financial analysis to determine the appropriate debt-financing option for the upfront capital costs and report back with a recommendation to a future Finance, Administration and Audit Committee meeting during the 2017 budget process and prior to the award recommendation to Council. Under the Energy Performance Contract, the ESCO is required to guarantee the energy savings resulting from the LED street light retrofit directly to the City through the contract structure, as it is the future energy and maintenance savings to pay-off the debt raised for the design and installation, as well as the operating and maintenance costs over the duration of the contract. Under this model, neither the design and installation costs nor the operation and maintenance costs will be funded through additional taxes. In addition to paying for the project, there is an additional cashflow to the City, resulting from the future energy and maintenance savings the future energy and maintenance savings to pay-off the total project costs.

It has been determined that an Energy Performance Contract is the ideal delivery model for the LED street light retrofit project and has projected a significant reduction in energy consumption and savings in operating and maintenance costs. It has also determined that the overall value for money is greater for an Energy Performance Contract delivery model, compared to delivering the project through the Traditional or in-house (i.e. Design Bid Build) procurement model. A summary

of the recommended Energy Performance Contract for the City's LED Street Light retrofit project is outlined below:

- Contract term of 18 years (i.e. 3 year design and installation and 15 year operation and maintenance).
- Total nominal cost for the project of \$32M over the full contract term, including adaptive controls (\$19.1M costs for design and installation to be debt-financed).
- Total nominal energy savings of \$33.8M over the full contract term.
- Total nominal maintenance savings of \$7.7M over the full contract term.
- Additional cashflow to the City of \$9.5M over contract term, resulting from the future energy and maintenance savings above the total project costs.
- Overall value for money of 35% or \$14.7M potential savings, compared to the City delivering project through the Traditional or in-house (i.e. Design Bid build) procurement model.
- Reduction in street light energy usage by 61%.

Given the estimated energy and maintenance savings of the LED street light retrofit project and the estimated value for money of delivering the LED street light retrofit project through an Energy Performance Contract, it is recommended that Staff proceeds with the procurement of an Energy Performance Contract.

Due to the value of the LED street light retrofit project and that an Energy Performance Contract is specialized in nature, it is further recommended that the City obtain the specialist project management, technical and financial advisory services required to lead this procurement, as well as the retention of an independent Fairness Advisor.

The recommended project timeline, including activities and durations, has been developed in the LED Street Light Retrofit Study: Business Case & Financing Alternatives, with an anticipated commencement of installations for Q2 2017. Pending Council's endorsement of the recommendations contained in this report, Staff will use this project timeline as a road map for delivery of the retrofit project.

#### Relationship to the 2014-2018 Term of Council Service Excellence Strategy Map

The recommendations contained in this report support the following Term of Council Priorities:

- Improve municipal road network
- Invest, renew and manage infrastructure and assets
- Continue to ensure the safety and well-being of citizens
- Meet Council tax rate targets (no greater than 3%)
- Continue to cultivate and environmentally sustainable City
- Citizen experience and service delivery
- End-to-end citizen centered services
- Service delivery options
- Financial sustainability

#### **Regional Implications**

The City operates and maintains the street lights on Regional roads, while York Region operates and maintains the street lights at Regional intersections. To ensure consistency in the City's road network and promote collaboration in the provision of street lighting services, the City has engaged York Region and provided them with the opportunity to join the project in partnership. York Region has not decided on whether it intends to be integrated with the City's project at this time.

The City will continue to consult with York Region on this project to determine potential interest in taking part in the City's retrofit project.

#### **Conclusion**

In response to the City's Energy Conservation and Demand Management Plan, endorsed by Council in 2014, the City retained Espirito Corp. to complete the LED Street Light Study: Business Case & Financing Alternatives for a large scale, City-wide LED street light retrofit project.

As a result of the LED Street Light Study: Business Case & Financing Alternatives, this report recommends that Staff proceed with the procurement process for an Energy Performance Contract for the City-wide LED street light retrofit project due to the estimated energy and maintenance savings of the LED street light retrofit project and the estimated value for money of delivering the LED street light retrofit project through an Energy Performance Contract.

Pending Council's endorsement of the report's recommendations, Staff will retain the necessary external advisory services required to lead the procurement of the Energy Performance Contract.

Staff will conduct further financial analysis to determine the appropriate debt-financing option for the upfront capital costs and report back with a recommendation to a future Finance, Administration and Audit Committee meeting during the 2017 budget process and prior to the award recommendation to Council.

#### Attachment

1. LED Street Light Retrofit Study: Business Case & Financing Alternatives – Executive Summary

#### Report prepared by:

Adam Payler, Business Analyst, TSPFO Shawn McKenzie, Senior Engineering Assistant, TSPFO. Vince Musacchio, Manager of Infrastructure Planning, Infrastructure Delivery Wynkie Ha Hau, Senior Financial Analyst, Financial Planning and Development Finance Andy Lee, Environmental Engineer, Development Engineering and Infrastructure Planning Tony Iacobelli, Manager of Environmental Sustainability, Environmental Sustainability Kailyn Smith, Sustainability Coordinator, Environmental Sustainability

Respectfully submitted,

Paul Jankowski, Deputy City Manager of Public Works Zoran Postic, Director of Transportation Services, Parks and Forestry Operations



# CORPORATION OF THE CITY OF VAUGHAN



LED Street Light Retrofit Study: Executive Summary

June 2016





"Places Enabling People"



### Executive Summary

#### Background

The City of Vaughan's Council has directed staff through the Energy Conservation and Demand Management Plan to prepare a Business Case that explores the feasibility and value for money of a Light Emitting Diode (LED) street lighting retrofit project to enhance road safety across the City's road network. The key aim of the Plan is to produce energy savings and greater efficiencies, thereby reducing the City's long-term fiscal liability. Council also believes that the LED street lighting enhancements, given the superior quality of LED illumination, will support, sustain, and enliven their neighbourhoods and contribute substantively to the goals set out in the Term of Council Service Excellence Strategy Map. The City also intends to consider for inclusion current and future planned projects that require road networks, such as Vaughan Metropolitan Centre and future housing developments, to integrate LED street lighting at all times.

Espirito Corp ("Espirito") was appointed in January 2016 to work with the City and apply their expertise to develop a Business Case and analyze financing alternatives, the purpose of which is to consider the investment rationale for an energy savings retrofit scheme for the City current high pressure sodium (HPS) street lights. The intended outcome is to reduce the current annual expenditure on street lighting related electricity as well as maintenance costs. With a reduction in energy consumption and corresponding maintenance, the project will contribute strongly to environmental goals such as reducing carbon emissions and achieving greater sustainability.

Espirito has been guided by an internal technical and financial project team, with representation from Transportation Services, Parks and Forestry Operations, Infrastructure Delivery, Financial Planning and Development Finance, Development Engineering and Infrastructure Planning, and Environmental Sustainability.

The purpose of the LED Street Lighting Retrofit Study: Business Case and Financing Alternatives (the Business Case) is to demonstrate a sound financial basis for a comprehensive retrofit of the City's approximately 24,000 existing HPS street light luminaires. In summary, this involves:

- Calculation of the total cost to retrofit the City of Vaughan's ("the City" or "COV") street light asset with LED technology and possibly adaptive controls;
- Calculation of the lifecycle cost-savings and energy-savings to be realized from the LED street light retrofit;
- Recommendation of a financing strategy for a large scale LED street light retrofit that compares the "value for money" ("VfM") of different financing alternatives, and;
- Recommendation of the next steps for financing and procuring a LED street light retrofit.

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#### Process

Espirito's project team has undertaken a number of key tasks to analyze the COV's street lighting assets, characterize financing alternatives, and finally develop the conclusions and recommendations to establish a compelling Business Case. These tasks include:

- Project Screening The objective of the project screening or qualitative analysis process is to explore a range of feasible project delivery methods based upon the priorities and needs for the COV, ranging from Design Bid Build (Tradition or in-house) public sector procurement approaches to P3 models (e.g., Design-Build-Finance-Maintain-Operate (DBFMO)). Espirito conducted an half day project screening workshop with the COV project team to develop a robust qualitative assessment of the various procurement options available currently in the market and to narrow down the scope to inform the VfM analysis. The delivery models considered were:
  - Design Bid Build (Traditional or in-house)
  - Design Build
  - Energy Performance Contract
  - Lease Structures (Standard, Lease Purchase)
  - Design Build Finance
  - Design Build Finance Maintain (and Operate)

Paying close attention to the four key models identified by the COV in the RFP, the diagram below illustrates the key four models in the RFP and also the extent of risk transfer that normally occurs, ranging from little risk transfer under Traditional models to mostly transferred risk under P3 projects.



 <u>Technical Analysis</u> – Working closely with the City's technical lighting team, Espirito has completed the analysis of the street lighting assets; developed archetypical street layout configurations derived from the COV's historical and current Design Criteria and the Illuminating Engineering Society of North America's (IESNA) RP-8 illumination standards;

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modelled selected LED luminaire market products across the asset from their own updated database of current fixtures and lamp replacement technology; and developed a full costing model for LED replacements.

- <u>Energy Analysis</u> Based upon the archetypical lighting outputs supplied by the City, Espirito has developed credible energy savings models for a new, optimized network. The energy savings analysis is benchmarked against the "do nothing" option, should the retrofit project not take place and the City continue with standard HPS lamps. The energy savings have been calculated using adaptive controls for the majority of the street lights.
- <u>Risk Analysis</u> To support transparency and integrity of the risk analysis, a detailed risk matrix was developed to evaluate the Design Bid Build (Traditional or in-house) option against that of an Energy Performance Contract option, the two preferred procurement options determined in the Screening Analysis. This entailed Espirito working through each phase of the project with the City project team, identifying and scoring risks according to the collective view which entity is best to manage them and based upon other similar delivered project's risk analyses. The project team members participated in two workshops in February 2016 where each and every risk associated with the project was considered and assessed for Probability and Impact. These risks are then modelled using a Monte Carlo analysis and quantified in dollars for inclusion in the VfM analysis.
- <u>Value for Money Analysis</u> To understand the most favorable project delivery model and deal structure, Espirito has conducted a VfM analysis, based on methodology that Infrastructure Ontario uses to assess its public investments, that factors-in all the above steps into a quantified comparison analysis of the two most favored procurement options; Design Bid Build (Traditional or in-house) and Energy Performance Contract. The VfM analysis quantifies and compares the risks retained by the COV under the Design Bid Build (Traditional or in-house) method of procurement, to the Energy Performance Contract model, in addition to a comparison of the projected cash flows under each delivery model. The differential in net present cost between the two delivery options, inclusive of retained risk to the COV, is estimated as the VfM and expressed as a percentage.
- <u>Next Steps</u> With the VfM analysis complete, the Business Case outlines the procurement methodology, estimated timelines and budget requirements to deliver the project.

#### Findings & Recommendations

Through completion of the LED Street Light Retrofit Study: Business Case & Financing Alternatives, it is recommended that the City pursues an Energy Performance Contract to deliver the LED street light retrofit project. In an Energy Performance Contract deal structure, the City, through a competitive procurement process, would contract with a private sector Energy Service Company



(ESCO) to design and install the LED street light retrofit project and to operate and maintain all of the street lights over a defined contract term.

To fund the retrofit project, debt-financing is required for the upfront capital costs associated with the design and installation. Under the Energy Performance Contract, the ESCO is required to guarantee the energy savings resulting from the LED street light retrofit directly to the City through the contract structure, as it is the future energy and maintenance savings that the City will use to pay the debt stream. The City will deploy the future energy and maintenance savings to pay-off the debt raised for the design and installation, as well as the operating and maintenance costs over the duration of the contract. Under this model, neither the design and installation costs nor the operation and maintenance costs will be funded through additional taxes. In addition to paying for the project, there is an additional cashflow to the City, resulting from the future energy and maintenance savings above the total project costs.

It has been determined that an Energy Performance Contract is the ideal delivery model for the LED street light retrofit project and has projected a significant reduction in energy consumption and savings in operating and maintenance costs. It has also determined that the overall value for money is greater for an Energy Performance Contract delivery model, compared to delivering the project through the Traditional or in-house (i.e. Design Bid Build) procurement model. A summary of the recommended Energy Performance Contract for the City's LED Street Light retrofit project is outlined below:

- Contract term of 18 years (i.e. 3 year design and installation and 15 year operation and maintenance).
- Total nominal cost for the project of \$32M over the full contract term, including adaptive controls (\$19.1M costs for design and installation to be debt-financed).
- Total nominal energy savings of \$33.8M over the full contract term.
- Total nominal maintenance savings of \$7.7M over the full contract term.
- Additional cashflow to the City of \$9.5M over contract term, resulting from the future energy and maintenance savings above the total project costs.
- Overall value for money of 35% or \$14.7M potential savings, compared to the City delivering project through the Traditional or in-house (i.e. Design Bid build) procurement model.
- Reduction in street light energy usage by 61%.

Given the estimated energy and maintenance savings of the LED street light retrofit project and the estimated value for money of delivering the LED street light retrofit project through an Energy Performance Contract, it is recommended that Staff proceeds with the procurement of an Energy Performance Contract.

Energy Performance Contracts have existed in various forms and have been used across many infrastructure sectors since the late 1980's. In recent years, with the introduction of LED technology

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they have become particularly good value in the street lighting industry, offering greatly enhanced payback periods, brought about by the large differential cost savings over more traditional street lighting such as HPS. The model is used around the globe but most recently, and closer to Vaughan, Newmarket, Barrie, Niagara Falls, London and LaSalle have all contracted with ESCO's to deliver their street lighting projects.

There is a growing market interest in the ESCO delivery model, both for the public and private sector, particularly in Ontario and across Canada in general. Based upon this growing interest and the connections Espirito has within the market, we believe that there will be good interest in this project from the private sector, which will lead to a robust competitive procurement process and optimum value for the City. To maximise competitive pricing tension and to commence the process of realizing energy and maintenance savings, it is recommended the COV bring the project to market as soon as possible.

#### Next Steps

The recommended project timeline, including activities and durations, has been developed and are outlined below:

	Activity	Duration
1.	Council report and presentation of the Business Case.	N/A
2.	Staff develop and issue procurement documentation to engage external advisors	Development of documentation – 4 weeks RFP and evaluation period – 6 weeks
3.	Complete street lighting asset database, update design criteria to RP-8-14 and develop archetypical street layouts	6 weeks
4.	Develop RFEOI and issue to market for main procurement, narrow down to three credible bidders for RFP	Development of documentation - 4 weeks RFEOI period and evaluation - 8 weeks
5.	Develop procurement documentation for main	3 to 4 months



	procurement, including verification of energy review	
6.	Council approve appropriate debt-financing option	N/A
7.	Procurement process with market and evaluation of shortlisted bidders	4 months
8.	Preferred Bidder - Appoint preferred bidder and conclude schedules/ contract. Secure financing	1 month
9.	Installation Period	3 years
10.	Operational period	15 years

The timeline is purposively aggressive to maximize the savings to the COV and will require dedicated resources from within COV with a clear decision making governance structure to achieve, however the benefits derived from the energy and maintenance savings and the enhanced quality of street lighting to the City justifies this approach. To support the dedicated in-house resources, external specialist technical and financial/ transaction advisors will likely need to be appointed to develop the body contents to the procurement documentation and the schedules to the main contract. A technical advisor will also be required to complete the City's asset database and archetypical street layouts which are currently half completed.

Moreover, we recommend that an experienced dedicated Project Lead is allocated to closely manage the procurement process and oversee the contract implementation phase for the project. This person will need to be regarded as "internal" to the COV even if seconded from a private sector organization, and given sufficient seniority so that they can manage and coordinate the internal and external advisors. In addition, as this project has a large capital value and is specialized in nature, we recommend that an independent Fairness Advisor is considered to ensure the conduct of the procurement and to protect the COV from future challenges from unsuccessful bidders.

#### **Our Vision**

Our Vision is "Places Enabling People". We believe in environments and communities that are accessible to all, bridging multi-cultural and economic divides and providing quality and safe platforms to enable the success of those who use them. Whether housing, places of education, transportation or working environments that inspire success and wellbeing.

#### **Our Mission**

We work alongside our clients to develop and deliver inspiring projects that offer innovative solutions, achieve Value for Money and encompass sustainable, long term solutions. With relentless focus on achieving the highest quality and client satisfaction, we will constantly strive to excel and become your Trusted Advisor.



"Places Enabling People"



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