



## City of Regina Wastewater Treatment Plant Upgrade Design, Build, Finance, Operate, & Maintain Project



The City of Regina's detailed analysis and planning process led it to use the Design, Build, Finance, Operate, and Maintain (DBFOM) delivery mechanism to carry out necessary upgrades to its wastewater treatment plant. The City's model incorporated private sector financing, carefully allocated risks, expedited construction, and minimized facility lifecycle costs.

The City of Regina, Saskatchewan needed to quickly upgrade and expand an outdated wastewater treatment facility. After extensive analysis, the City embarked on an alternative service delivery method. The project has received significant attention due to the extensive preparation and planning that went into the procurement process. The City also intentionally incorporated an innovative private sector financing model that linked capital payments to performance. While heralded by professional organizations and the provincial government as pioneering, the project also stirred resentment among some groups, including the public employees union.

## Key Project Details

Table 1. Key Project Details

<b>Project Title:</b>	<b>Regina wastewater treatment plant upgrade</b>
<b>Primary Facility:</b>	Upgraded wastewater treatment plant (24.3 mgd average demand and 118.9 mgd wet weather flow)
<b>Local Government Entity:</b>	City of Regina, Saskatchewan, Canada
<b>Primary Partner(s):</b>	EPCOR Prairies Inc.
<b>Delivery Model:</b>	Design, Build, Finance, Operate, and Maintain (DBFOM)
<b>Contract Period:</b>	30 years
<b>Population Served:</b>	200,000 people in 2013, growing to an estimated 258,000 people in 2035 <sup>1</sup>
<b>Major Initial Outlays:</b>	\$180.8 million over a five year period
<b>Flow of Revenues:</b>	City of Regina collects user fees and uses a portion of them to make its contractual payments, which include both operating and capital components

## Background

The City of Regina is the capital of Canada's province of Saskatchewan. It is a vibrant, fast-growing region, with a population of approximately 200,000 people projected to grow to 258,000 by 2035.<sup>2</sup> Regina's wastewater treatment plant, originally constructed in the 1950s and upgraded in 1980, relied on outdated treatment technology and equipment that was near the end of its useful life. The facility also had reached its capacity and needed to be expanded. The new wastewater treatment permit issued to the City in 2014 required updated treatment processes in order to meet much more stringent effluent requirements.<sup>3</sup> This new permit took effect at the end of 2016, leaving the City relatively little time to design and construct an upgraded plant.<sup>4</sup>

## Project Development and Procurement

The City devoted a substantial amount of time and resources to thoughtfully planning and preparing for this project. According to the project manager, as many as five full-time Regina staff members were devoted to the project during procurement.<sup>5</sup>

Prior to proceeding with the DBFOM model, the City considered and analyzed 12 alternative options, each of which involved different models and financing scenarios. The City undertook a rigorous Value for Money (VfM) analysis, which identified and compared lifecycle capital, operation, and risk costs for each potential model. The City was required to carry out a VfM analysis in order to qualify for a Public Private Partnership (P3) grant from the Canadian government. The City's policy also strongly encouraged the completion of a VfM analysis.<sup>6</sup>

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<sup>1</sup> *Regina Wastewater Treatment Plant Upgrade Project, Saskatchewan: Delivering Clean and Safe Wastewater for a Growing City*. The Canadian Council for Public Private Partnerships. 2014.

<sup>2</sup> Wastewater Treatment Plant: Regina Wastewater Treatment Plant Construction 90% Complete. City of Regina. June 14, 2016. <http://www.regina.ca/residents/water-sewer/wastewater--treatment--plant/>

<sup>3</sup> *Alteration and Division of Permit to Operate a Sewage Works in the City of Regina*. Saskatchewan Water Security Agency. May 10, 2014.

<sup>4</sup> *Regina Wastewater Treatment Plant Upgrade Project, Saskatchewan: Delivering Clean and Safe Wastewater for a Growing City*. The Canadian Council for Public Private Partnerships. 2014.

<sup>5</sup> Rob Court (Manager, Environmental Engineering Branch), email correspondence with author, July 29, 2016.

<sup>6</sup> *The Regina Administration Bylaw (Bylaw No. 2003-69)*. City of Regina, Saskatchewan. September 22, 2014.

The City issued a Request for Qualifications (RFQ) in May of 2013 (see timeline in Table 2) and received responses from ten teams.<sup>7</sup> During this time, Regina Water Watch, an organization that favored a traditional procurement method and public management of the facility, launched a petition drive to demand the City hold a referendum to move forward with the DBFOM approach. The petition fell short of the number of authenticated signatures needed (10 percent of the population), but the City decided to hold a referendum anyway to allow for public involvement in the final procurement decision. An intense campaign ensued with the City and the Chamber of Commerce on one side and Regina Water Watch and its backers, including the primary public sector union, Canadian Union of Public Employees (CUPE), on the other. According to published reports, proponents and opponents of the measure spent well over \$500,000 to develop communication materials (videos, billboards, yard signs, etc.) for and against the proposal. In the end, 57 percent of approximately 49,000 voters voted against public management, thereby allowing the DBFOM model to proceed.<sup>8</sup>

The City invited three teams to participate in the Request for Proposals (RFP) phase beginning in October 2013. Information sharing was an essential component of this project. Regina established a special data site to share detailed technical documents and partial design information with proposers. The City also awarded a total of \$500,000 in stipends to the teams. According to the City Project Manager, the stipend likely only covered a small portion of the proposal cost, but it was an important sign of the City's dedication to the DBFOM approach.<sup>9</sup> Proposing teams and the City followed an extremely detailed proposal preparation structure. Throughout the entire process, the City adhered to extremely strict confidentiality and procurement procedural requirements. For example, during the proposal-drafting period, the City engaged a fairness adviser who was present throughout the many site visits and meetings to ensure a level playing field and that the City acted as a good public partner.

The final proposals included both detailed design and construction plans as well as detailed operations and maintenance plans. In May 2014, the City awarded the project to EPCOR Prairies Inc. (EPCOR), whose proposal came in at the lowest net present value (NPV). Prior to the final announcement and the signing of the project agreement in July 2014, the City Council entrusted the authority to award the contract and enter into the agreement to the Deputy City Manager and Chief Operating Officer. City Council required these delegates to follow a specified methodology, but sought to avoid the additional time and potential political pressure involved in sending the final decision back to the Council for approval. The City and EPCOR signed the contract in July 2014, and within a month EPCOR took over responsibility for operating the existing plant.

The City estimated that procurement of the project cost \$5 million dollars of staff time and external expenses. Major costs included the preliminary engineering work (\$1.599 million in 2014), financial and fairness consultants (approximately \$1 million), legal services (\$1.1 million), and honorariums provided to shortlisted bidders (\$500,000).<sup>10</sup> At the same time, the City estimated that the ten teams that participated in the RFQ phase may have each spent as much as \$500,000 in preparation costs, and the three finalists spent as much as \$2.5 million each.<sup>11</sup>

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<sup>7</sup> Court, Rob. *Successful Transfers of Responsibilities from the Owner to the DBFOM Partner, Regina WWTP*. Presentation to Design-Build for Water/Wastewater Conference in Charlotte, NC. April 20, 2016.

<sup>8</sup> *Regina Wastewater Treatment Plant Upgrade Project, Saskatchewan: Delivering Clean and Safe Wastewater for a Growing City*. The Canadian Council for Public Private Partnerships. 2014.

<sup>9</sup> Rob Court (Manager, Environmental Engineering Branch), interview with author, August 3, 2015.

<sup>10</sup> Rob Court (Manager, Environmental Engineering Branch), email correspondence with author, July 29, 2016.

<sup>11</sup> Court, Rob. *Regina's Wastewater Treatment Plant Upgrade Project: Procurement Process*. Presentation given October 29, 2015.

According to the City Project Manager, the project is “one of the most complex capital” projects the City has initiated to date. The upgraded plant includes three new bioreactors, which reduce ammonia and phosphorous in wastewater, the refurbishment of the primary sedimentation tanks, and three new secondary clarifiers.<sup>12</sup>

**Table 2. Select project milestones**

Date	Milestone
June 2011	Conceptual design of a new treatment plant begins and becomes the basis for delivery model evaluations. <sup>13</sup>
June 2012	With the authorization of the City Council, investigation of alternative delivery options begins. <sup>14</sup>
February 25, 2013	City Council approves the DBFOM delivery model. <sup>15</sup>
May 14, 2013	City issues RFQ, ten teams respond. <sup>16</sup>
June 21, 2013	P3 Canada Fund approves funding for the project. <sup>17</sup>
July 24, 2013	Regina City Council unanimously votes to hold a referendum on the project’s service delivery model. <sup>18</sup>
September 25, 2013	Referendum held, voters support DBFOM procurement model.
October 2013	City invites three teams to respond to the RFP.
May 29, 2014	City selects EPCOR to proceed with the project. <sup>19</sup>
July 3, 2014	City’s delegate representatives enter into agreement with EPCOR (financial close). <sup>20</sup>
August 1, 2014	EPCOR takes over managing Regina’s wastewater treatment plant. <sup>21</sup>
June 2016	Plant is 90% complete.
December 31, 2016	Scheduled construction plant completion date.

## Key Financial Features and Outcomes

The reported capital cost for the project was \$180.8 million.<sup>22</sup> EPCOR primarily financed this cost during construction; however, the agreement requires the City to reimburse EPCOR for some capital costs by paying an early milestone payment of \$30 million and \$49.7 million at substantial completion of requirements. The City funded part of the Substantial Completion payments from a P3 Canada grant (\$48.2 million) along with utility reserves generated from impact fees. The P3 Canada grant program is specifically designed to provide up to 25

<sup>12</sup> *Regina Wastewater Treatment Plant Upgrade Project, Saskatchewan: Delivering Clean and Safe Wastewater for a Growing City*. The Canadian Council for Public Private Partnerships. 2014.

<sup>13</sup> Rob Court (Manager, Environmental Engineering Branch), interview with author, August 3, 2015.

<sup>14</sup> *ibid.*

<sup>15</sup> Court, Rob. *Regina’s Wastewater Treatment Plant Upgrade Project: Project Background*. Presentation given at Stanford University’s P3 for Water Course. October 28, 2015.

<sup>16</sup> *ibid.*

<sup>17</sup> Rob Court (Manager, Environmental Engineering Branch), interview with author, August 3, 2015.

<sup>18</sup> Gilligan, Eugene. Regina voters approve P3 for wastewater plant. *InfraAmericas*. <http://www.infra-america.com/registration/login.php?lastUri=/news/canada/1280377/regina-voters-approve-p3-for-wastewater-plant.html>

<sup>19</sup> *Wastewater Treatment Plant: Regina Wastewater Treatment Plant Construction 90% Complete*. City of Regina. June 14, 2016. <http://www.regina.ca/residents/water-sewer/wastewater--treatment--plant/>

<sup>20</sup> Court, Rob. *Regina’s Wastewater Treatment Plant Upgrade Project: Project Background*. Presentation given at Stanford University’s P3 for Water Course. October 28, 2015.

<sup>21</sup> *Wastewater Treatment Plant: Regina Wastewater Treatment Plant Construction 90% Complete*. City of Regina. June 14, 2016. <http://www.regina.ca/residents/water-sewer/wastewater--treatment--plant/>

<sup>22</sup> All dollar denominations refer to Canadian Dollars

percent of the project development and construction capital costs for public private partnership projects. The grant to Regina was an integral financial component of this project and contributed to gaining public support for using a P3 delivery model.

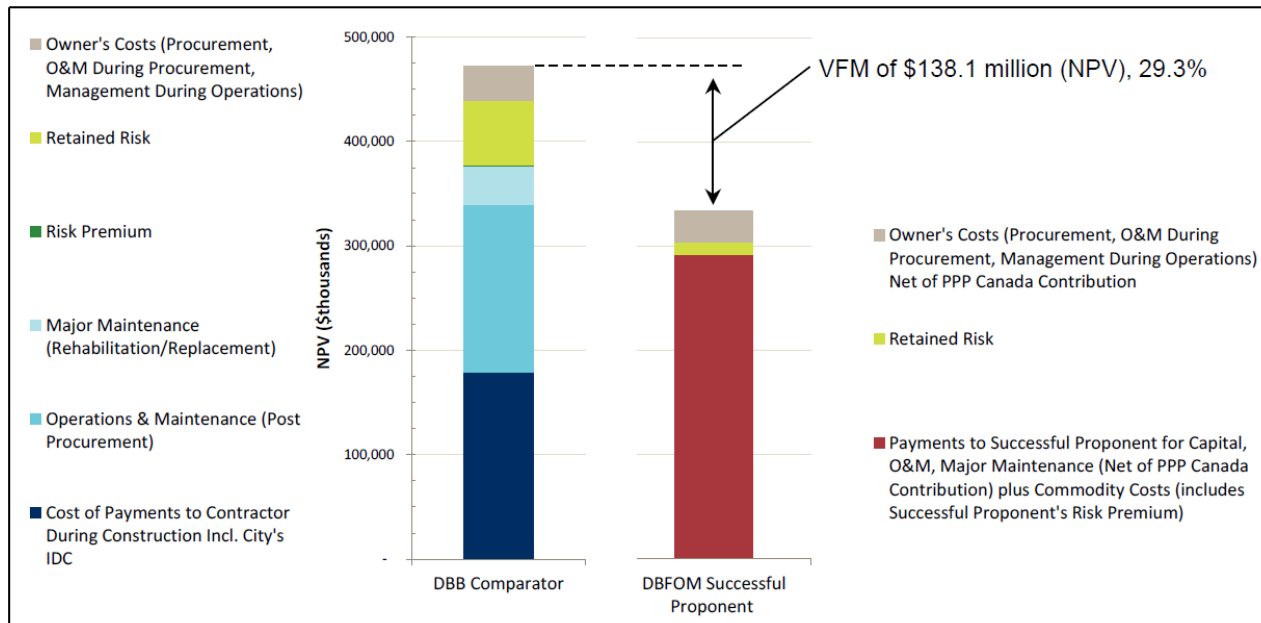
After completion of construction in 2017, the remaining \$78.7 million in construction costs will be considered a long-term loan from EPCOR to the City for the remaining term of the project agreement. This debt will be retired through a series of monthly contractually specified “capital payments.” The debt is considered to include risk costs absorbed by EPCOR and it carries an interest rate equivalent to 6.462 percent for a period of 27 ½ years. The City maintains the authority to withhold payments due to non-performance. The structure of this financing and payment arrangement was an integral component of the City’s strategy to allocate risk to EPCOR to incentivize performance. The risk table below shows a summary of select risk allocations.

**Table 3: Allocation of Select Risk Responsibilities**

Risk Category	Responsible Parties	Description
Permitting	EPCOR	Responsible for obtaining permits. While permits remain in City’s name, EPCOR is liable for any fines or costs to address violations.
	City of Regina	Responsible for facilitating initial interaction between Province and EPCOR; holds permits.
Design and Construction	EPCOR	Responsible for integrated design and construction services to meet certain volumetric and treatment quality performance specifications. Agreement includes substantial holdback and penalty clauses for construction delays.
	City of Regina	Maintains very minimal responsibility during construction of select legacy equipment.
Operations and Maintenance	EPCOR	Responsible for most aspects of operation of plant subject to detailed operation and management plans.
	City of Regina	Fiscally responsible for certain energy and chemical costs. EPCOR is responsible for costs if power and natural gas do not meet proposal performance specifications.
Recurring Capital Needs	EPCOR	Responsible for capital costs related to most aspects of the wastewater treatment plant for the life of the contract.
	City of Regina	Responsible for select “latent defects” in legacy equipment in early phase of agreement.
Risk Category	Responsible Parties	Description
Revenue/Demand	EPCOR	EPCOR’s revenue stream is not impacted by fluctuation in demand
	City of Regina	Responsible for full operation payment (other than a decrease in some pass through charges), even if demand falls drastically.
Financial/Debt	EPCOR	Responsible for approximately half of initial project construction capital cost structured as debt agreement with City.
	City of Regina	Responsible for approximately half of initial capital cost. Also responsible for monthly capital payments (debt service) to EPCOR that can be withheld due to lack of performance.
Catastrophic	EPCOR	Responsible for carrying certain types of insurance that cover some unexpected costs.

The City will make separate monthly payments to EPCOR that include a “capital payment”, an “infrastructure operation and maintenance payment,” and a “renewal payment.”<sup>23</sup> The exact nature and breakdown of these payments is confidential, but they do include funds to support all aspects of operation, minus some pass through commodity charges and capital costs associated with renewal and capital improvements. There will also be a separate commodity charge to cover commodities such as gas and electricity. Should EPCOR achieve higher efficiency in its use of natural gas and electricity than estimated in its financial offer, the costs savings will be shared fifty-fifty with the City. Regina maintains control of rate setting and their calculation of revenue requirements and customer rates will take into consideration costs paid to EPCOR. As part of its referendum communication plan, the City calculated and disseminated the annual savings per account (\$276) resulting from the award of the national P3 grant (assuming the impact of the entire amount was spread evenly over the first four years of the agreement).<sup>24</sup>

In interviews with project staff and in public presentations, the City has stated that it believes the DBFOM approach had a positive impact on the utility and ratepayers. The City carried out a detailed assessment of the DBFOM and other procurement options prior to moving forward. As mentioned above, the City used a rigorous VfM methodology, which included financial costs as well as estimated risk costs. By necessity, most VfM assessments depend on assumptions about different scenarios, and these assumptions ultimately impact the results. Regina conducted a revised VfM calculation based on the details of EPCOR’s specific proposal. The analysis showed a NPV savings of 20.1% for the chosen DBFOM over a traditional Design Bid Build (DBB) approach, excluding the P3 grant funds. Figure 2 below shows the NPV savings increases to 29.3% when including the \$48.2 million P3 grant.<sup>25</sup>



<sup>23</sup> *Agreement to Design, Build, Finance, Operate and Maintain: Regina Wastewater Treatment Plant Upgrade Project*. The City of Regina and EPCOR Water Prairies, Inc. July 3, 2014.

<sup>24</sup> Rob Court (Manager, Environmental Engineering Branch), email correspondence with author, July 29, 2016.

<sup>25</sup> *City of Regina Wastewater Treatment Plant Expansion & Upgrade Project: Value for Money Report*. Deloitte. July 24, 2014.

## Figure 2: Final Value for Money analysis from the City's perspective<sup>26</sup>

The savings of the DBFOM model over other options are due largely to assumptions related to the construction costs of the project and the reduction in retained risk for the City in the DBFOM approach. The ultimate cost for the project came in significantly lower than the original engineering estimate for a DBB project. It is impossible to know what the exact cost would have been under a DBB model, but the City and its contractor took great steps to minimize factors that typically lead to cost overruns and change orders. Likewise, it is impossible to confirm that the higher risk costs associated with the DBB model would actually have materialized in reality, but they were based on extensive discussions and analysis of a series of potential outcomes and the financial repercussions of those outcomes. The analysis included Monte Carlo simulations to develop risk profiles for each procurement process.

The City did not expect the arrangement to lead to significant operations and maintenance savings, with the exception of some modest energy and chemical savings.<sup>27</sup> One of the reasons the City predicted the operation costs would be fairly similar is that they structured the project agreement to facilitate transfer of labor. All labor agreements were subject to collective agreement and permitted employees to move to positions within the City.<sup>28</sup> In the end, 13 of the 24 staff positions transferred over to EPCOR, while other employees left or chose to stay with the City.<sup>29</sup> Employees who transferred to EPCOR worked for the City for the first five months of the contract and then made the transfer. All employees also received equal or better benefits through EPCOR's benefits package while remaining members of CUPE Local 21 as a separate bargaining unit.<sup>30,31</sup> Regina's choice of a DBFOM procurement model resulted in cost savings in some areas and increased costs in others. Increased costs came from extended project preparation, planning, and preliminary design costs that exceeded what would traditionally occur with a DBB approach. Yet these expenditures reduced uncertainty and risk later in the project. The most obvious impact of choosing a P3 approach was Regina's eligibility for and eventual award of a very sizeable grant. From the perspective of the City, this is a significant, quantifiable benefit of their choice and was an essential component of their communications strategy to promote this approach. Conversely, the decision to require private sector financing resulted in a non-risk adjusted cost of capital that was higher than the rate the City likely could have accessed. The City recently completed another major capital project that incorporated \$100 million of 30-year debt from the provincial government that carried a rate of 4.1 percent – a rate the Project Manager thought likely if the City had sought similar debt rather than turning to EPCOR. However, the project was specifically designed to incorporate private financing as a strategy to reduce capital and operational risk costs that the City felt would ultimately provide financial benefits and outweighed the increased capital cost. In the end, EPCOR used balance sheet financing and included a guarantee from their parent company (EPCOR Utilities Inc.), leading to a competitive capital rate for Regina as well as EPCOR having a significant stake in assuring the project's success.

At the time of publication, the project was scheduled to be completed on time without any major costly change orders.

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<sup>26</sup> Court, Rob. *Regina's Wastewater Treatment Plant Upgrade Project*. Presentation at the New Cities Foundation Workshop. May 9, 2016.

<sup>27</sup> *City of Regina Wastewater Treatment Plant Upgrade: Business Case Submission to PPP Canada*. Deloitte. March 4, 2013.

<sup>28</sup> *Regina Wastewater Treatment Plant Upgrade Project, Saskatchewan: Delivering Clean and Safe Wastewater for a Growing City*. The Canadian Council for Public Private Partnerships. 2014.

<sup>29</sup> Rob Court (Manager, Environmental Engineering Branch), interview with author, August 3, 2015.

<sup>30</sup> *ibid*

<sup>31</sup> *Regina Wastewater Treatment Plant Upgrade Project, Saskatchewan: Delivering Clean and Safe Wastewater for a Growing City*. The Canadian Council for Public Private Partnerships. 2014.

## Appendix A. Simplified Project Financial Flows

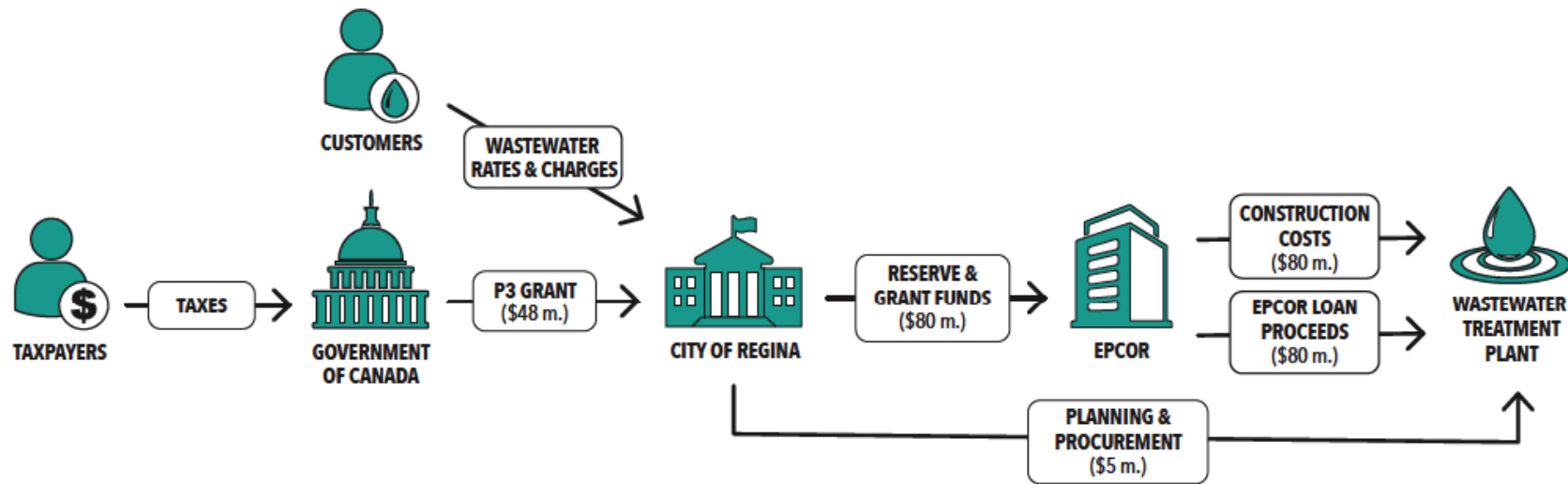


Figure 3. Flow of Initial Project Outlays

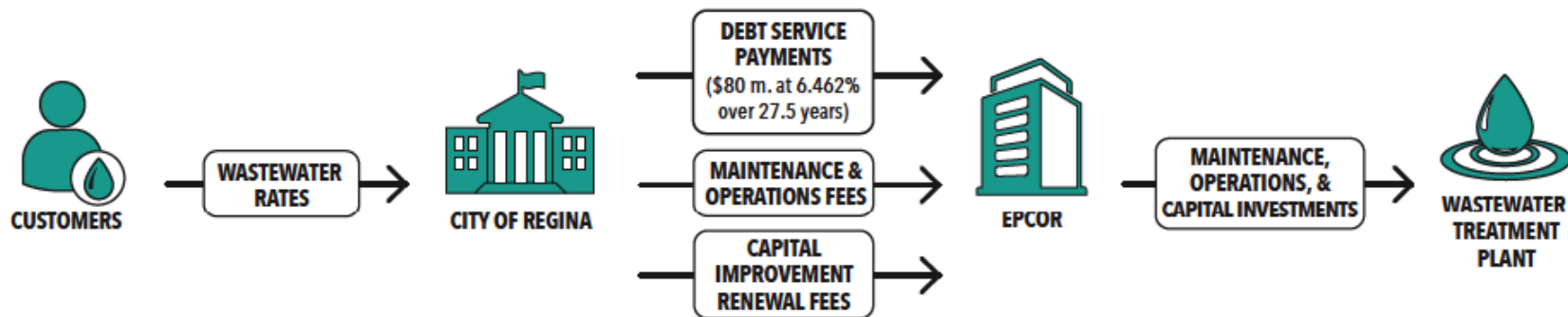


Figure 4. Recurring Financial Flows





## Acknowledgements

Written by Jeff Hughes<sup>†</sup> and Carol Rosenfeld

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Cover photo: Construction to upgrade Regina Wastewater Treatment Plant. Used with permission from Rob Court, City of Regina.

<sup>†</sup>*Jeff Hughes is a member of the United States Environmental Protection Agency's Environmental Finance Advisory Board.*

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