



Alternative Comparison Summary

Alternative Water Source Program

City of Joliet, IL
December 2020



Joliet Alternative Water Source Program Introduction

The Alternative Water Source Program Comparison Document is intended to provide a concise, visual comparison of key features, costs, and risks associated with each of the alternatives being considered by the City of Joliet. Information in the document is taken from the Prospectus and Basis of Design documents prepared as part of the 2020 Evaluation but is presented in a side-by-side format to facilitate comparison of the alternatives.

The Comparison Document is presented in three sections structured to provide information that can be used to compare the alternatives.

Overview and Common Elements

- Program Strategic Plan Vision and Mission
- Common Elements of the Two Source Alternatives
- Review of Current and Possible Future Lake Michigan Water Rates




Alternative Comparisons

- Key Features of the Alternatives
- Risk to Schedule
- Implementation Costs/Debt Burden
- Average Cost to Customers
- Cost Benefits of Regionalization
- Annual Cash Flow & 50-year Total Cost of Water
- Future Cost Increase Sensitivity
- Joliet’s Level of Control
- Joliet’s Operational Responsibility
- Reliability/Resiliency
- Comparison Summary

Other Considerations/Conclusion



Several of the comparison topics presented include assessments of the relative value associated with certain aspects of each alternative. These assessments use the symbols shown below:

	Favorable or Advantageous
	Neutral
	Unfavorable or Challenging

It is important to note that the assessments provided on the following pages are qualitative in nature, so a favorable assessment in one area does not necessarily balance out an unfavorable assessment in another.

Moreover, the assessments provided should not be interpreted as a recommendation of one alternative or the other. They are intended to inform decision-makers and help them understand relative features of both alternatives.

Joliet Alternative Water Source Program Strategic Plan

The Vision and Mission statements included in Joliet’s Strategic Plan for the Alternative Water Source Program define critical requirements that must be met.

Vision

To be recognized by our customers, employees, elected officials, regulatory agencies and the water industry as a leader in providing sustainable, reliable and high-quality water in an innovative and efficient manner for our community.

Mission

To provide a **sustainable, reliable** and **high-quality** water supply for Joliet and potentially the region **by 2030** in order to support the public health, safety and economic interests of the community

These requirements establish the foundation for Joliet’s future water supply.



Alternative Water Source Program Requirements

Sustainable

Can it supply projected long-term demands?
Both alternatives have the ability to meet future maximum day demands for Joliet and the region

Reliable

Does it limit risk of service interruption under range of conditions?
Both alternatives include reserve storage and utilization of backup wells

High-Quality Water

Is it able to deliver water that meets water quality standards?
Chicago produces high quality water; A new advanced water treatment plant will produce high quality water

Online by 2030

Can it deliver new source of water by summer 2030?
Based on the 2020 Evaluation, it was determined that both alternatives can be implemented by 2030

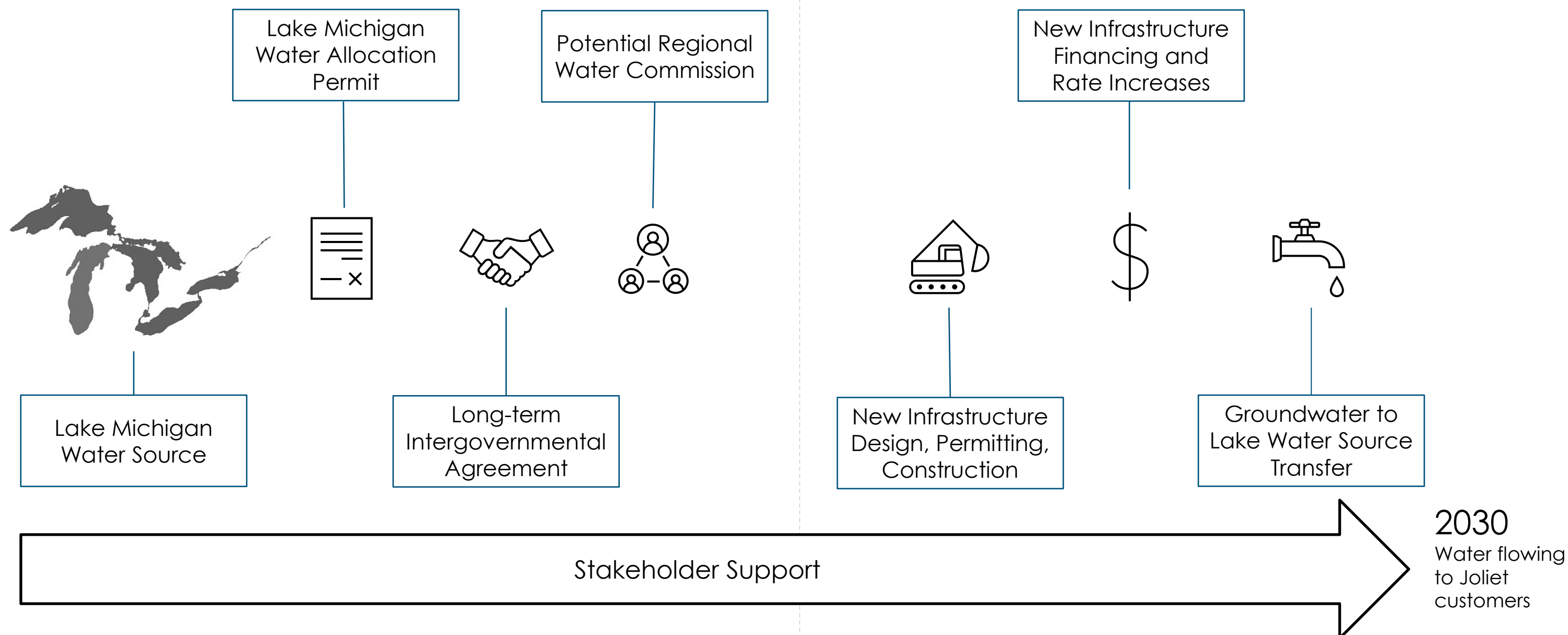
CDWM Alternative	New Indiana Intake Alternative
✓	✓
✓	✓
✓	✓
✓	✓

Bottom Line: Both alternatives support and achieve Joliet’s Strategic Plan Mission Statement.



Joliet Alternative Water Source Program Common Elements

Both alternatives will require significant capital investment and water rate increases for the development and implementation of a new Lake Michigan water source for Joliet and potentially the region. Common elements include permits, agreements, infrastructure design, financing strategies, and source transfer provisions. Completion of these elements will require the support of stakeholders including the public, regional partners, regulators, local governmental officials as well as our state and federal legislators.



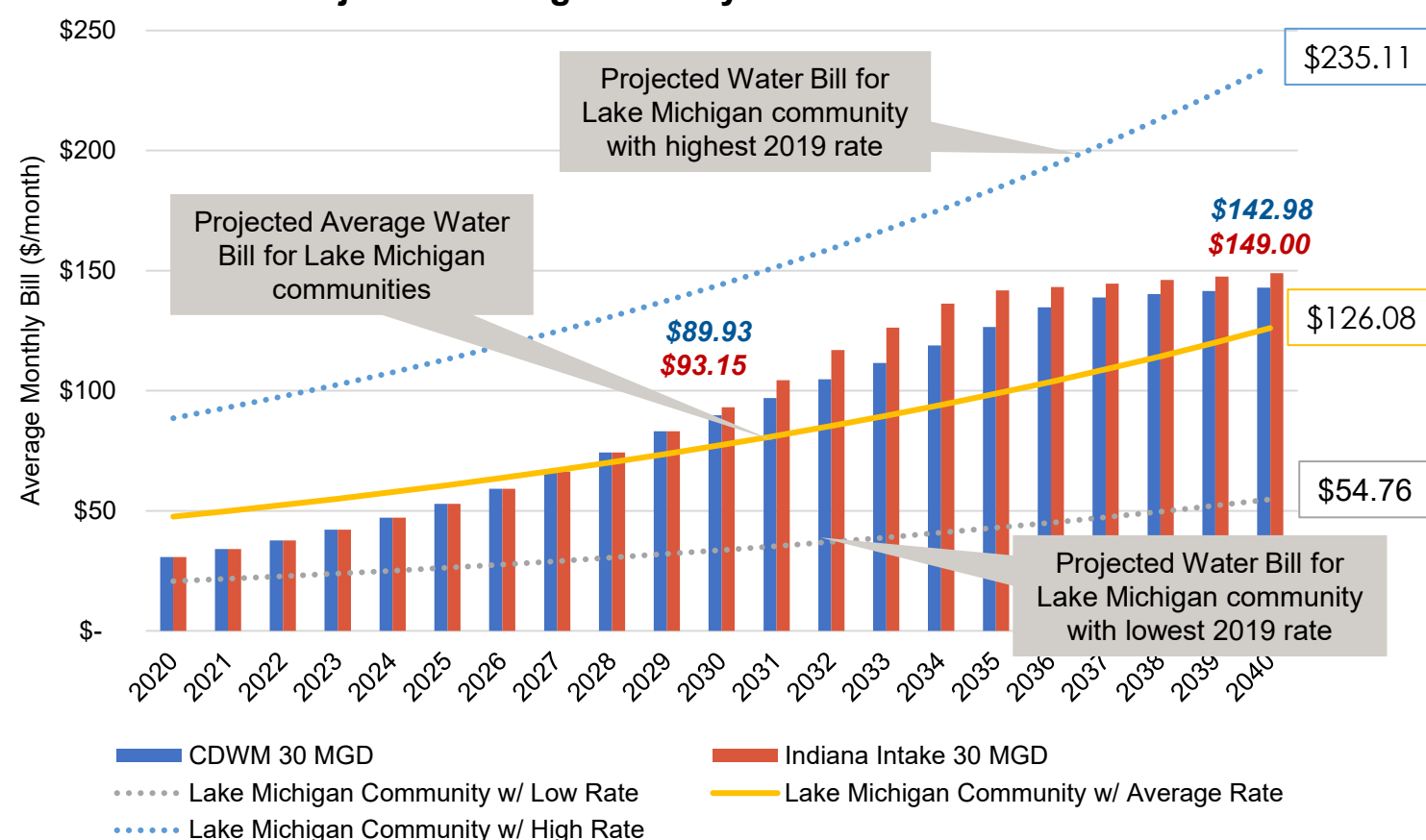


Joliet Alternative Water Source Program

Average Monthly Water Bills

The red and blue columns in the charts on this page and the following page show projected average water rates for a typical residential customer in Joliet required to support implementation of the Alternative Water Source Program. The chart below shows how those rates would align with projected rates for other Lake Michigan water utilities in northeastern Illinois. Future rates for Lake Michigan communities are projected based on *FY2019 Northeastern Illinois Water and Sewer Utility Rate Data* (CMAP, 2020) for over 100 Lake Michigan water communities and an assumed annual rate increase of 5%/year consistent with historic data for water utilities nationwide.

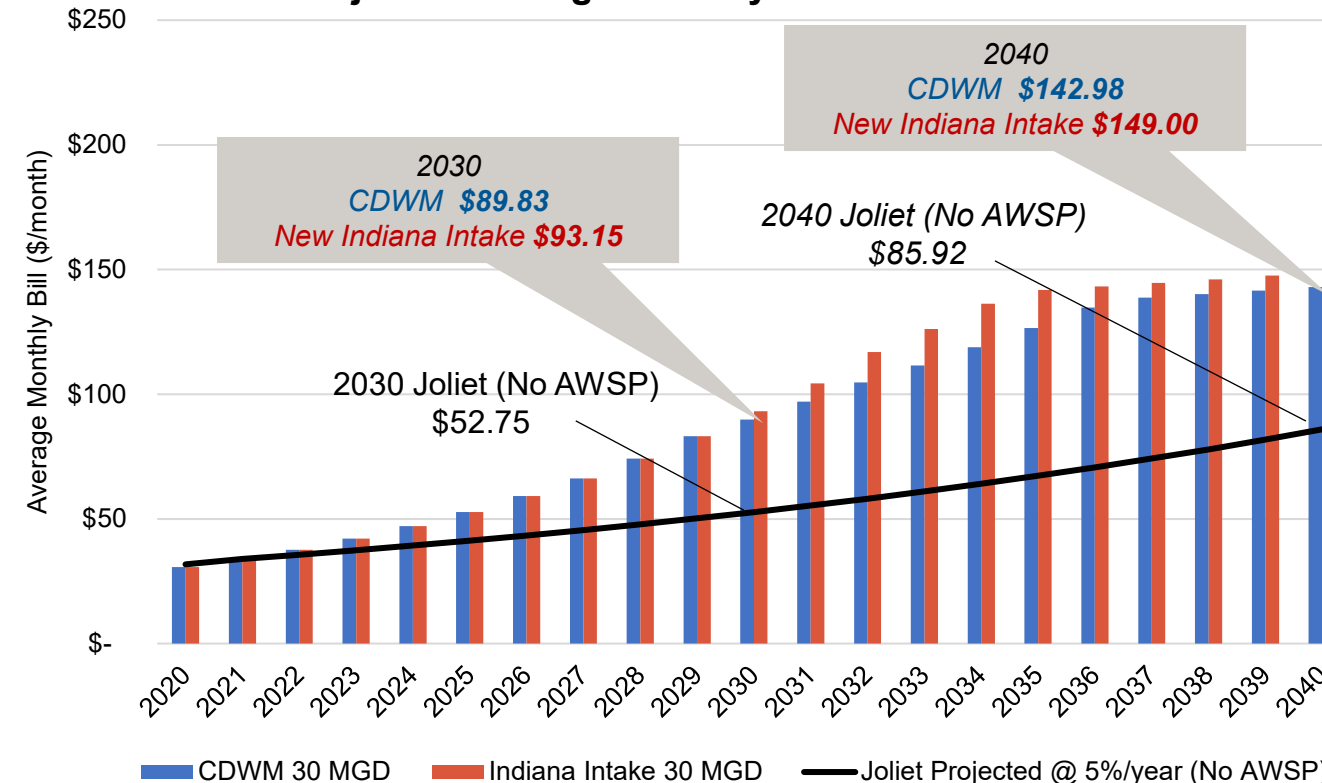
Projected Average Monthly Water Bill – 30 MGD



Bottom Line: Joliet's projected monthly average water bill in 2040 for either new water source alternative will be slightly above the projected average but far below the highest average monthly water bill for regional Lake Michigan communities.

There is a significant cost associated with providing reliable, high quality drinking water to the residents of Joliet, and this cost increases over time. An average monthly bill for water in Joliet is currently about \$34/month. Without the implementation of the Alternative Water Source Program, it is estimated that an average monthly water bill in 2040 would be about \$86/month, assuming industry standard 5% escalation. **However, implementing the Alternative Water Source Program is required as Joliet's deep aquifer cannot supply the City's maximum day demand beyond 2030.**

Projected Average Monthly Water Bill – 30 MGD



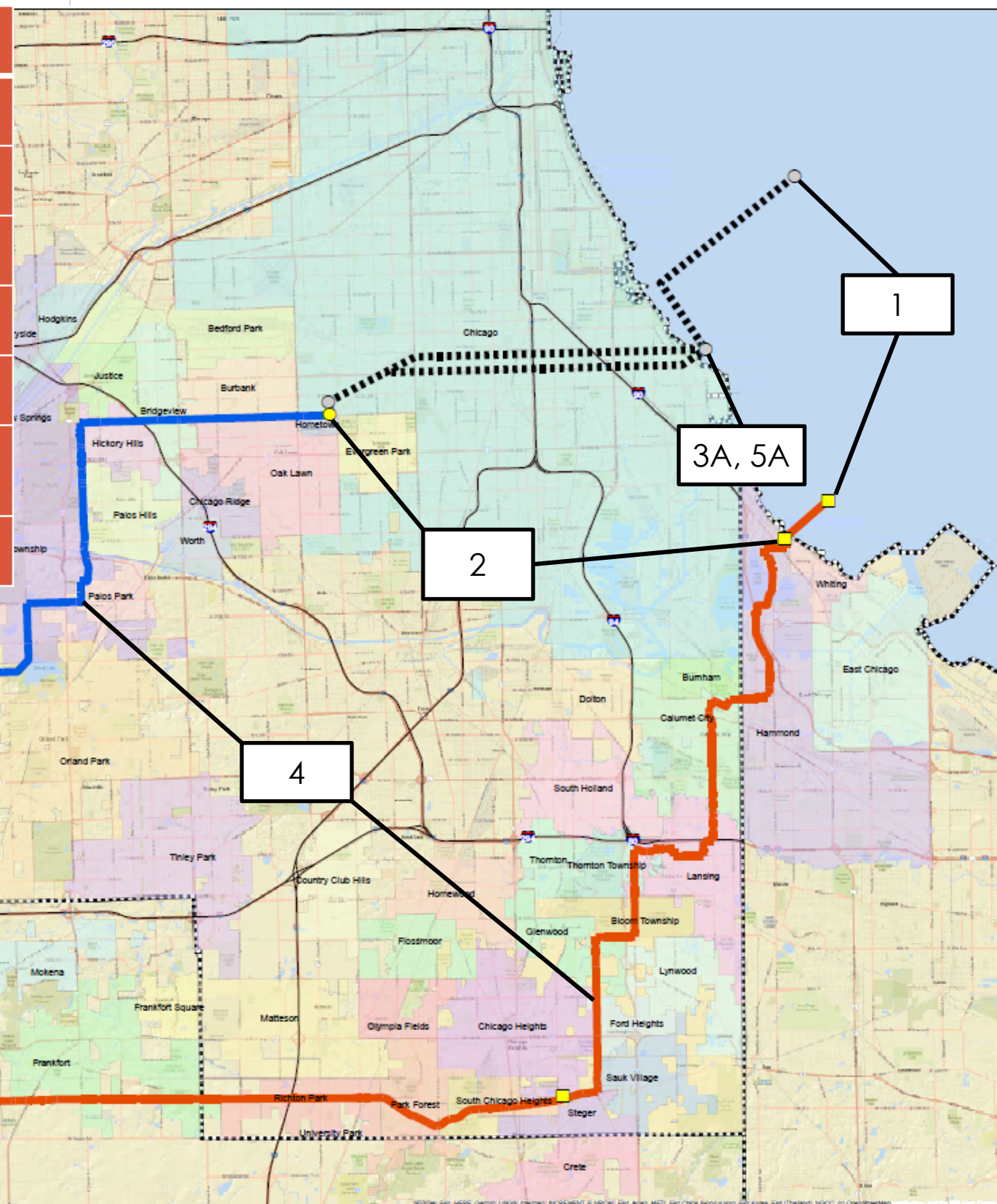
Bottom Line: Water rates would need to increase over the next 20 years to support operation and maintenance of water system infrastructure regardless of implementation of the Alternative Water Source Program. This must be accounted for when evaluating the impact of the program on average monthly water bills.



Joliet Alternative Water Source Program

Alternative Feature Comparison

Feature	CDWM Alternative	New Indiana Intake Alternative
1 Source	Lake Michigan	Lake Michigan
2 Water Supply/ Access	Treated Water Purchase from Chicago	Raw Water Pipeline right-of-way through Hammond
3 Treatment	Sawyer Water Purification Plant(Chicago) – (3A)	New Advanced Water Treatment Plant(Joliet) – (3B)
4 Transmission/ Delivery	30.7 miles (100% in IL)	46.4 miles (> 85% in IL)
5 Source Water Transfer	Corrosion Control by Chicago - (5A), Modified by Joliet	Corrosion Control by Joliet – (5B)
6 Distribution Modifications/ Regional Network	23 – 30 miles	27 – 35 miles
Capital Cost 30 MGD/60 MGD	\$592M/\$810M	\$1.03B/\$1.37B



Joliet Alternative Water Source Program

RISK TO SCHEDULE



CDWM Alternative

- Lake Michigan Allocation Permit Delay**
Joliet is well positioned to receive a Lake Michigan Water Allocation Permit given its current reliance on the deep aquifer system.
- Land/ROW Acquisition Delay**
CDWM Alternative will require coordination with Chicago, Chicago Park District, and ROW agencies along 31.7 mile transmission main route.
- Infrastructure Permitting Delay**
CDWM Alternative will require acquisition of IEPA construction permits, environmental permits, and roadway/waterway/railroad crossing permits along 31.7 mile alignment.
- Infrastructure Construction (Joliet) Delay**
CDWM Alternative will require completion of more than 16 major construction contracts in Illinois for work with a value of approximately \$600M to \$800 M.
- Infrastructure Construction (Others) Delay**
CDWM Alternative will require significant coordination of construction with the City of Chicago and the Chicago Park District for the proposed connection facilities at the Southwest Pumping Station/Durkin Park site. In addition, Chicago will be responsible for design and construction of the live connection to the Southwest Tunnel Zone.
- System Commissioning/Start-up Delay**
CDWM Alternative will require start-up, commissioning, and source transfer for a new transmission delivery system.



New Indiana Intake Alternative

- Lake Michigan Allocation Permit Delay**
Joliet is well positioned to receive a Lake Michigan Water Allocation Permit given its current reliance on the deep aquifer system. Interstate nature of system could prompt challenge.
- Land/ROW Acquisition Delay**
New Indiana Intake Alternative will require acquisition of land for Intake Shore Facilities, Water Treatment Plant, and ROW agencies along 46.4 mile transmission main.
- Infrastructure Permitting Delay**
New Indiana Intake Alternative will require acquisition of new intake and WTP permits as well as IEPA construction permits, environmental permits, and roadway/waterway/railroad crossing permits along 46.4 mile alignment in two states.
- Infrastructure Construction (Joliet) Delay**
New Indiana Intake Alternative will require completion of more than 19 major construction contracts in Illinois and Indiana for work with a value of approximately \$1.03B to \$1.37B.
- Infrastructure Construction (Others) Delay**
New Indiana Intake Alternative does not require Joliet to be involved in the construction of facilities to be owned and operated by others.
- System Commissioning/Start-up Delay**
New Indiana Intake Alternative will require start-up, commissioning, and source transfer for new intake, treatment, and transmission/delivery system.

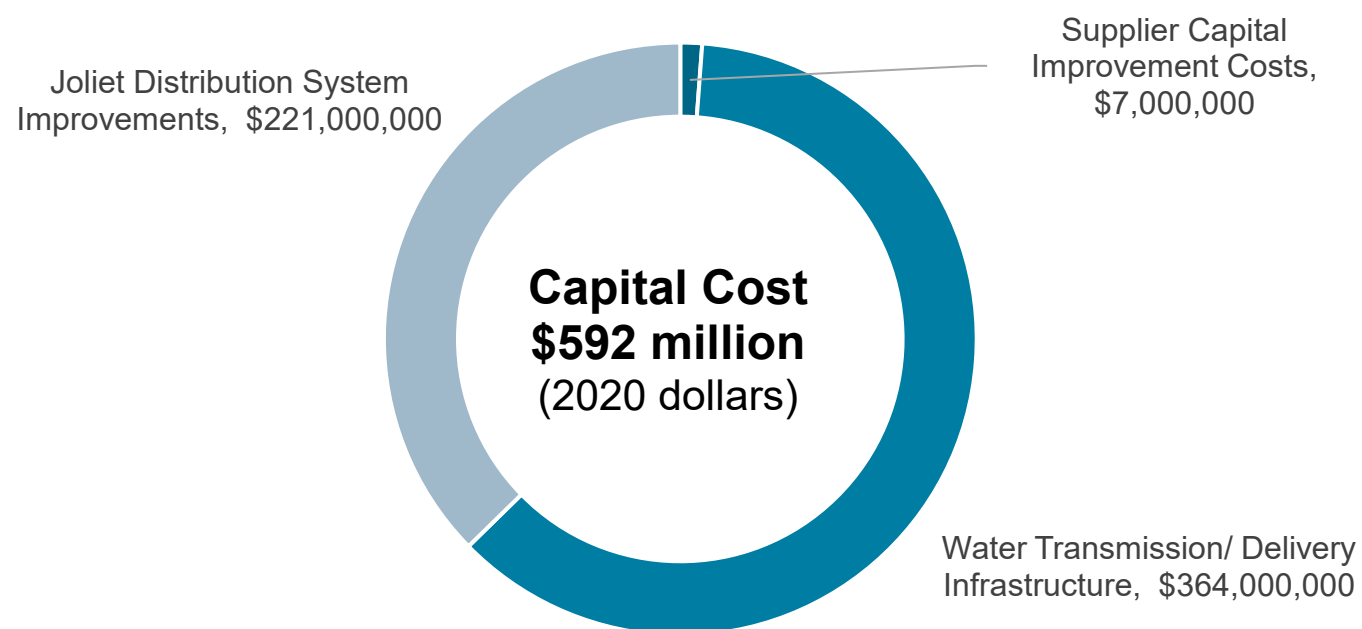
Bottom Line: Risk to Schedule is greater for the New Indiana Intake Alternative given its magnitude, complexity and interstate construction.



Joliet Alternative Water Source Program IMPLEMENTATION COSTS/ DEBT BURDEN



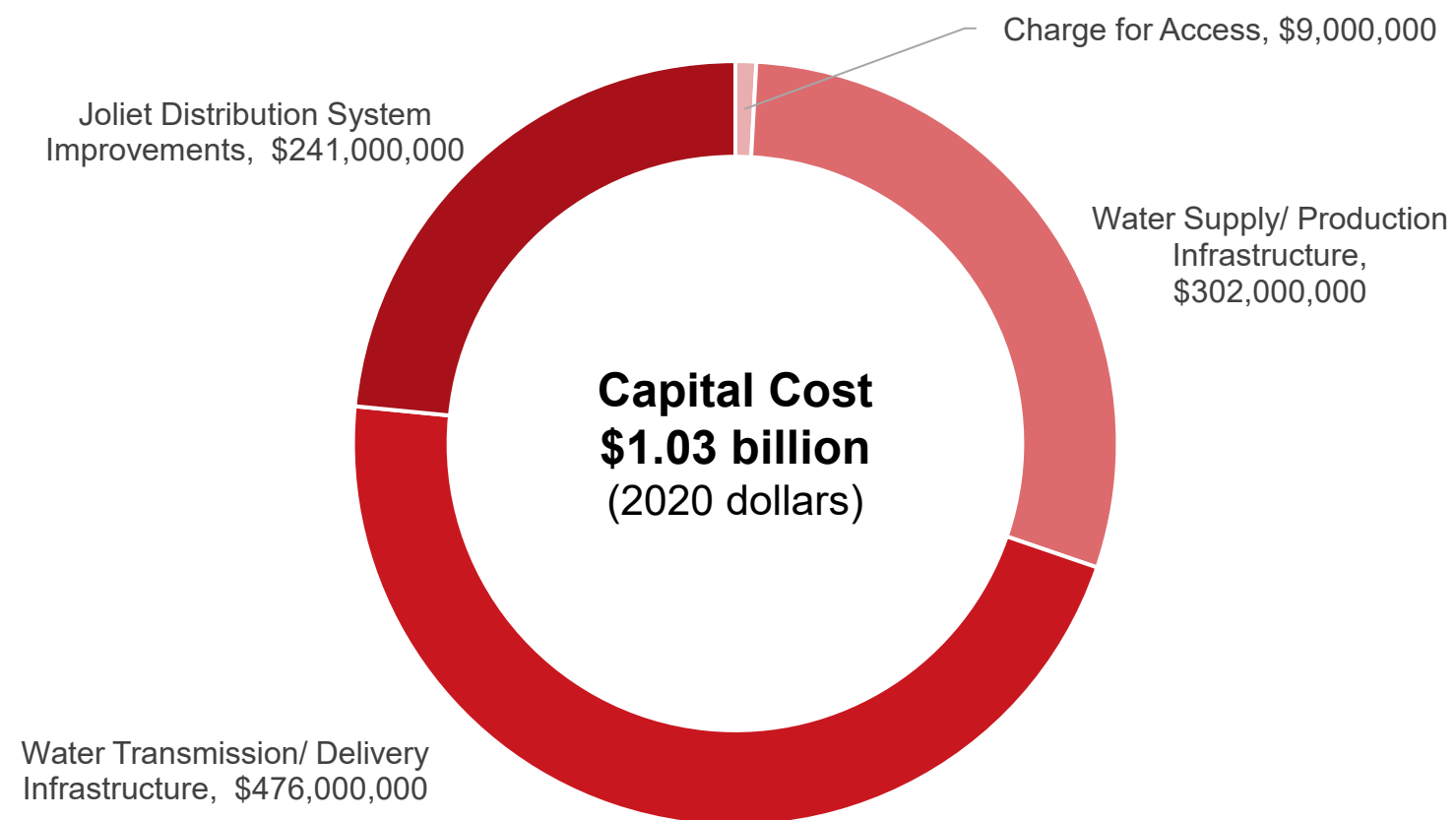
CDWM Alternative (30 MGD)



The graphic above shows the total capital cost of improvements for the CDWM Alternative - Joliet Only (30 MGD) Demand Scenario. The estimated capital cost for the CDWM Alternative - Regional (60 MGD) Demand Scenario is estimated to be \$810 million.



New Indiana Intake Alternative (30 MGD)



The graphic above shows the total capital cost of improvements for the New Indiana Intake Alternative - Joliet Only (30 MGD) Demand Scenario. The estimated capital cost for the New Indiana Intake Alternative - Regional (60 MGD) Demand Scenario is estimated to be \$1.37 billion.

Bottom Line: The New Indiana Intake Alternative requires significant infrastructure and capital expenditures resulting in a higher debt burden for the City.

Joliet Alternative Water Source Program

AVERAGE COST TO CUSTOMERS



Joliet Only (30 MGD) Demand Scenario

The actual cost to customers for Joliet’s new water source will be based on a combination of costs for operation and maintenance of Joliet’s existing water infrastructure (including accelerated water main replacement to reduce levels of non-revenue water), debt service costs for financing of the required new capital improvements plus costs for the purchase of water or property/right-of-way access, and operating, maintenance, and replacement costs for the new water system infrastructure.

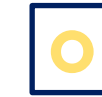
Regardless of the Alternative selected by the City, relatively consistent rate increases will be required over the next 10 years to fund water main replacement, design efforts, and land acquisition as well as construction. Projected water rates after 2030 differ slightly as a result of the different levels of total costs associated with the Alternatives.

For the Joliet Only (30 MGD) Demand Scenario, the average monthly water bill for the CDWM Alternative is estimated to be about 4% lower than for the New Indiana Intake Alternative in 2040.

Bottom Line: For the Joliet only Demand Scenario (30 MGD), during the 20-year financial planning period, future average monthly water bills differ by less than 4% between the two alternatives in 2040, with the CDWM Alternative being lower.

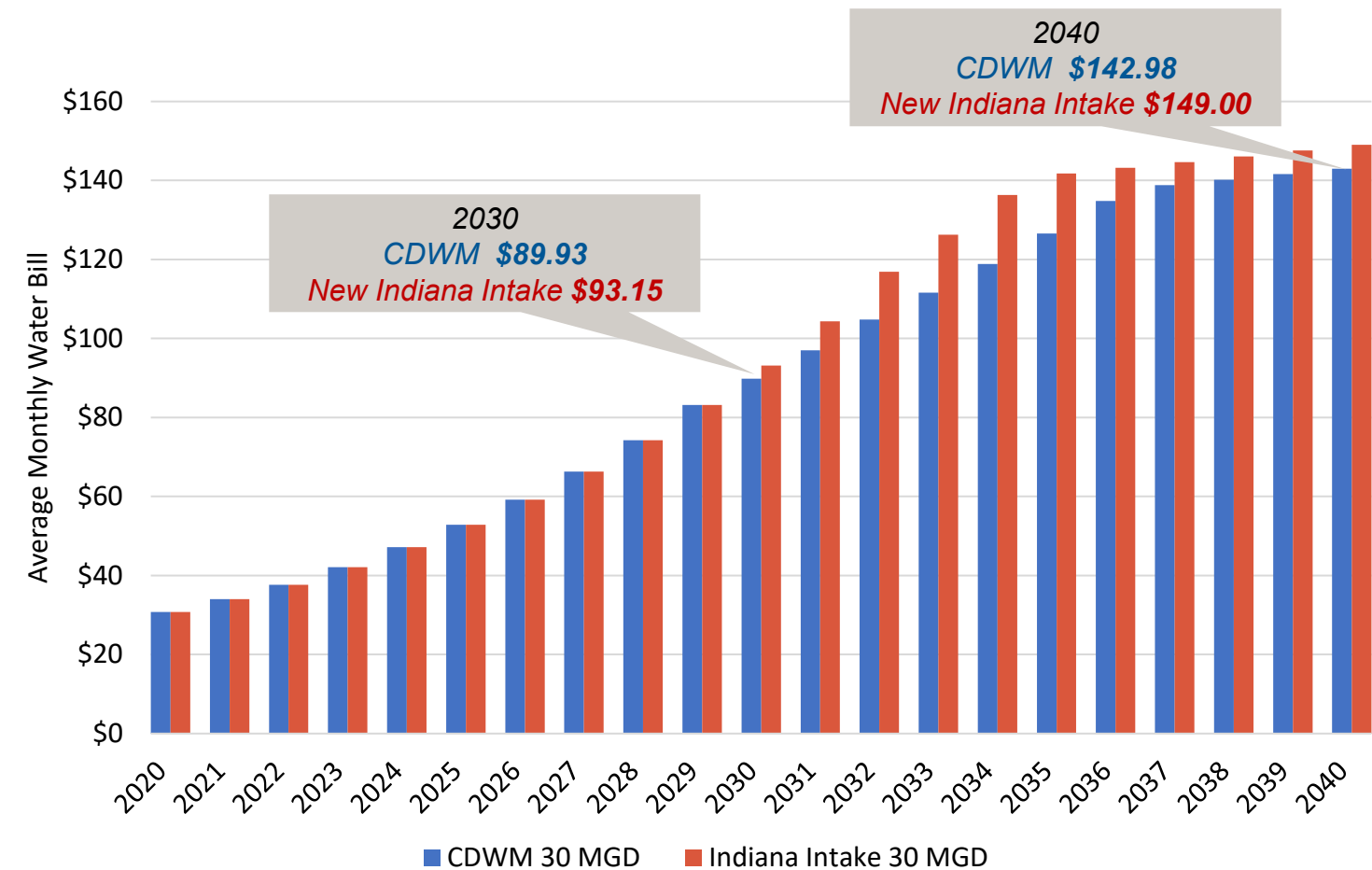


CDWM Alternative



New Indiana Intake Alternative

Joliet Only (30 MGD) Demand Scenario



Based on average usage of 700 cf, not including trash/sewer. Increases are for the water source alternative and general water system improvements.

Joliet Alternative Water Source Program

COST BENEFITS OF REGIONALIZATION



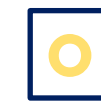
Regional (60 MGD) Demand Scenario

Development of a regional water system will allow the costs for water purchase or property/right-of-way access, capital improvements and debt service, and operating, maintenance, and replacement of the new water infrastructure to be spread across a regional customer base larger than the City of Joliet. As a result, the projected average monthly cost to customers in Joliet is lower for a Regional scenario than it is for the Joliet Only scenario regardless of the source alternative selected.

The savings provided by a Regional approach are greater for the New Indiana Intake alternative due to economies of scale associated with capital improvements that do not apply to costs for the purchase of water.

For the Regional (60 MGD) Supply Scenario the savings realized for the CDWM Alternative are estimated to be about 12% (2030) to 14% (2040). Estimated savings resulting from regionalization for the New Indiana Intake Alternative are estimated to be 20% (2030) to 25% (2040).

Bottom Line: With a regional water system there would be a cost savings to Joliet customers for both alternatives; however, regionalization presents a greater opportunity for savings with the New Indiana Intake Alternative due to economies of scale associated with capital improvements versus purchased water.

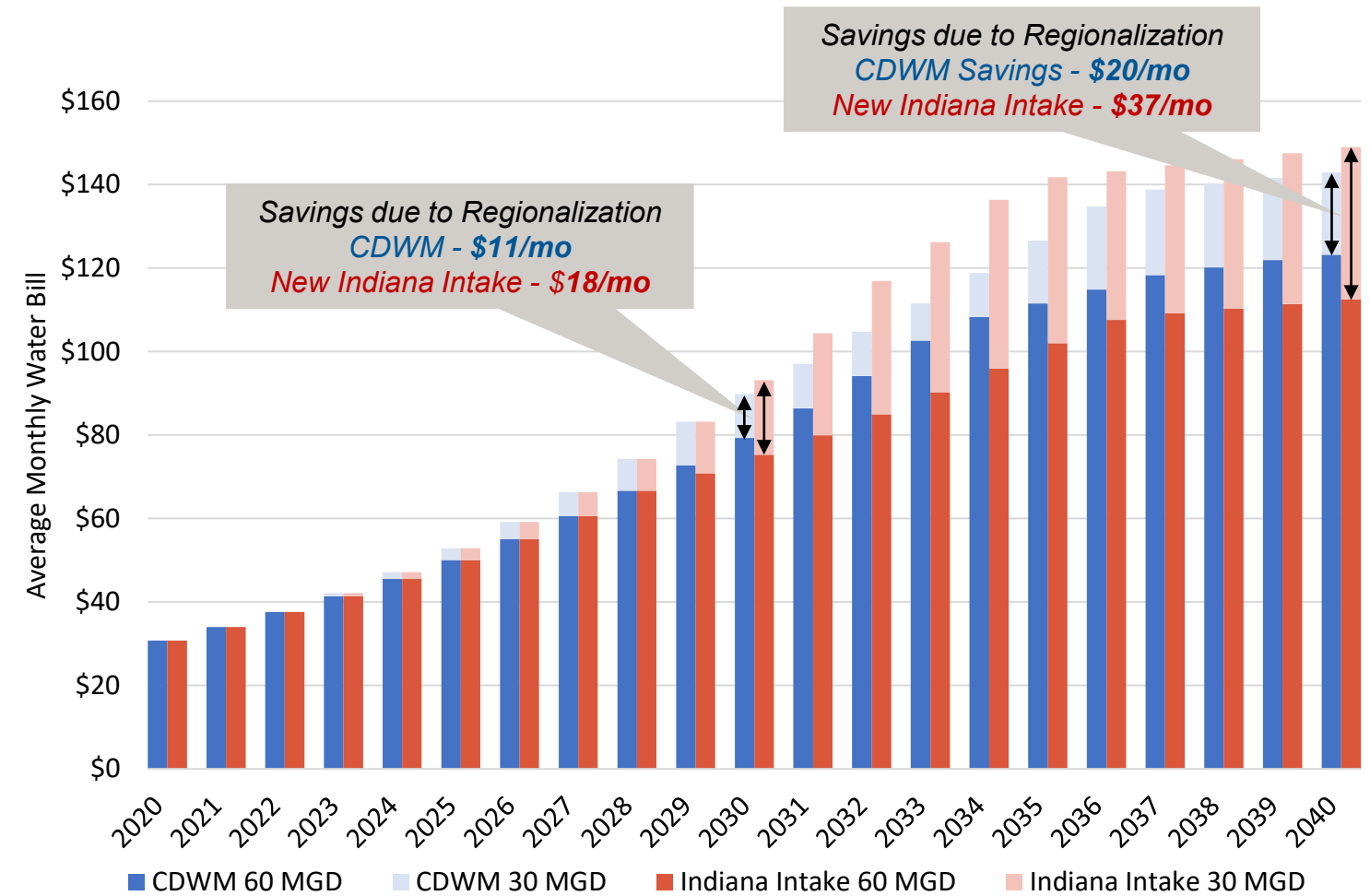


CDWM Alternative



New Indiana Intake Alternative

Regional (60 MGD) Demand Scenario



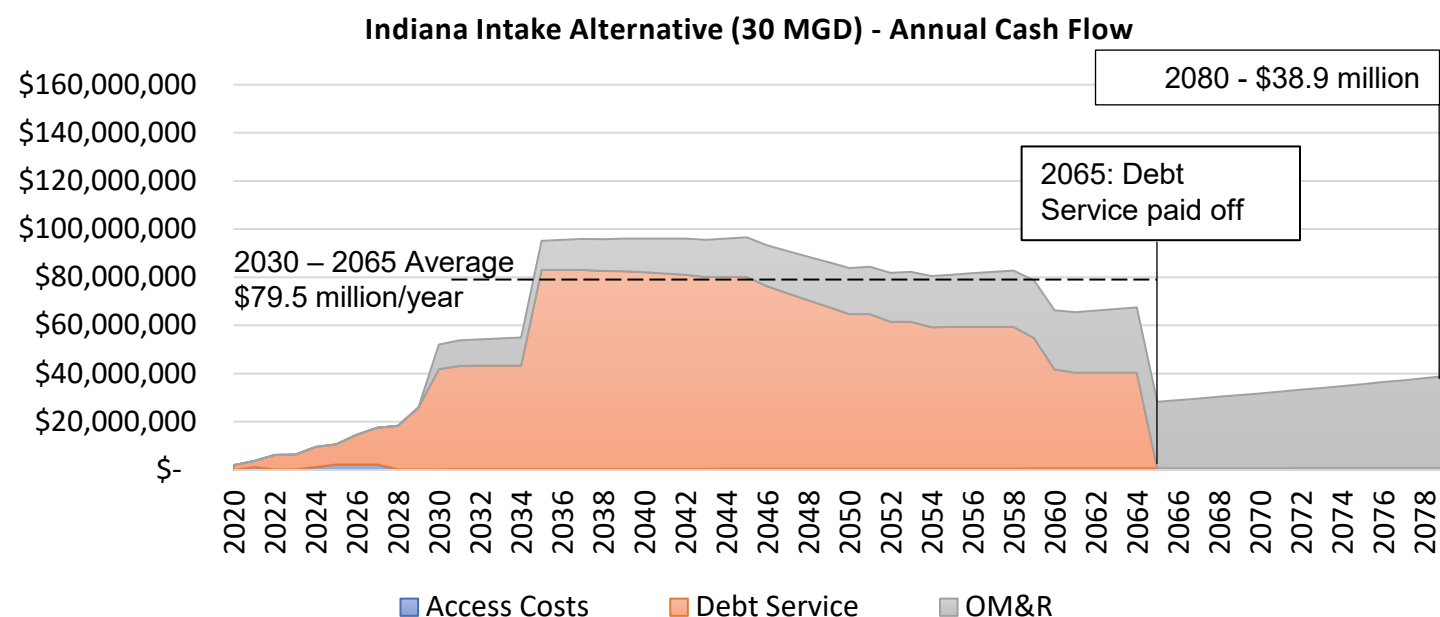
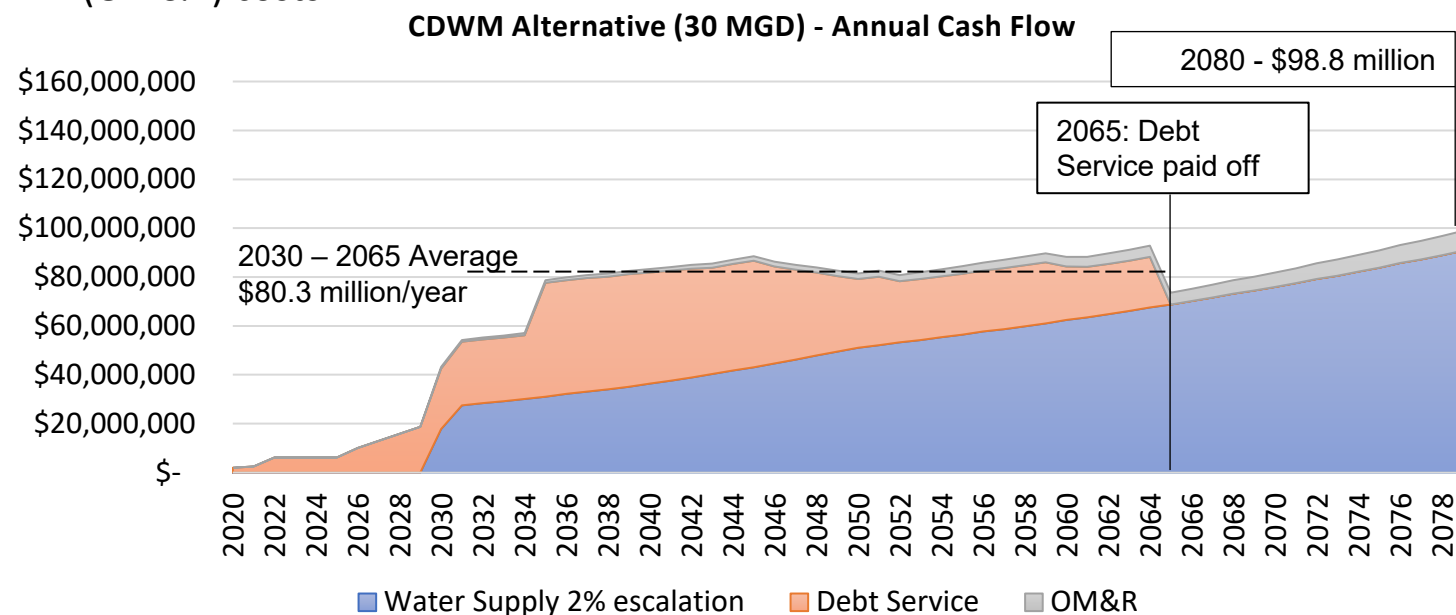
Based on average usage of 700 cf, not including trash/sewer. Increases are for the water source alternative and general water system improvements.



Joliet Alternative Water Source Program

ANNUAL CASH FLOW & 50-YEAR TOTAL COST OF WATER

Annual cash flow requirements for the Alternative Water Source Program include Chicago water purchase costs or Hammond access costs, debt service on capital improvements, and operating, maintenance, and replacement (OM&R) costs.

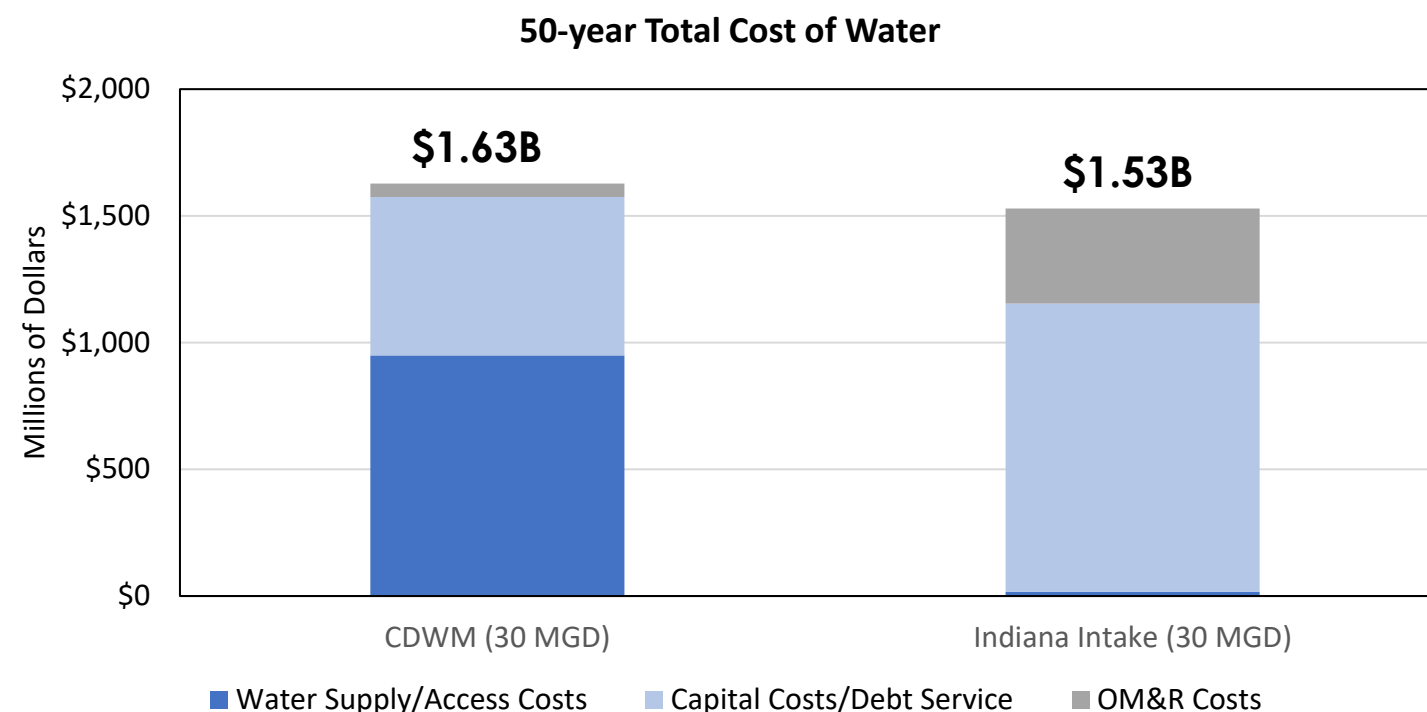


CDWM Alternative (30 MGD)



New Indiana Intake Alternative (30 MGD)

The present value of these costs over time makes up the 50-year Total Cost of Water. Purchased water costs make up the largest part of the Total Cost of Water for the CDWM Alternative and are expected to increase over time. The largest component of the Total Cost of Water for the New Indiana Intake Alternative consists of debt service payments for capital improvements.



The Total Cost of Water values shown above are based on a 3% discount rate that reflects the time value of money. The 3% rate is consistent with the estimated average cost of capital (borrowing) used in the program analysis.

Bottom Line: The present value of the 50-year Total Cost of Water is not significantly different and in the short-term (during debt repayment), annual cash flow is similar between the Alternatives. However, annual cash flow for the New Indiana Intake Alternative becomes significantly lower than the CDWM Alternative after the debt service from capital improvements is paid off in 2065.



Joliet Alternative Water Source Program

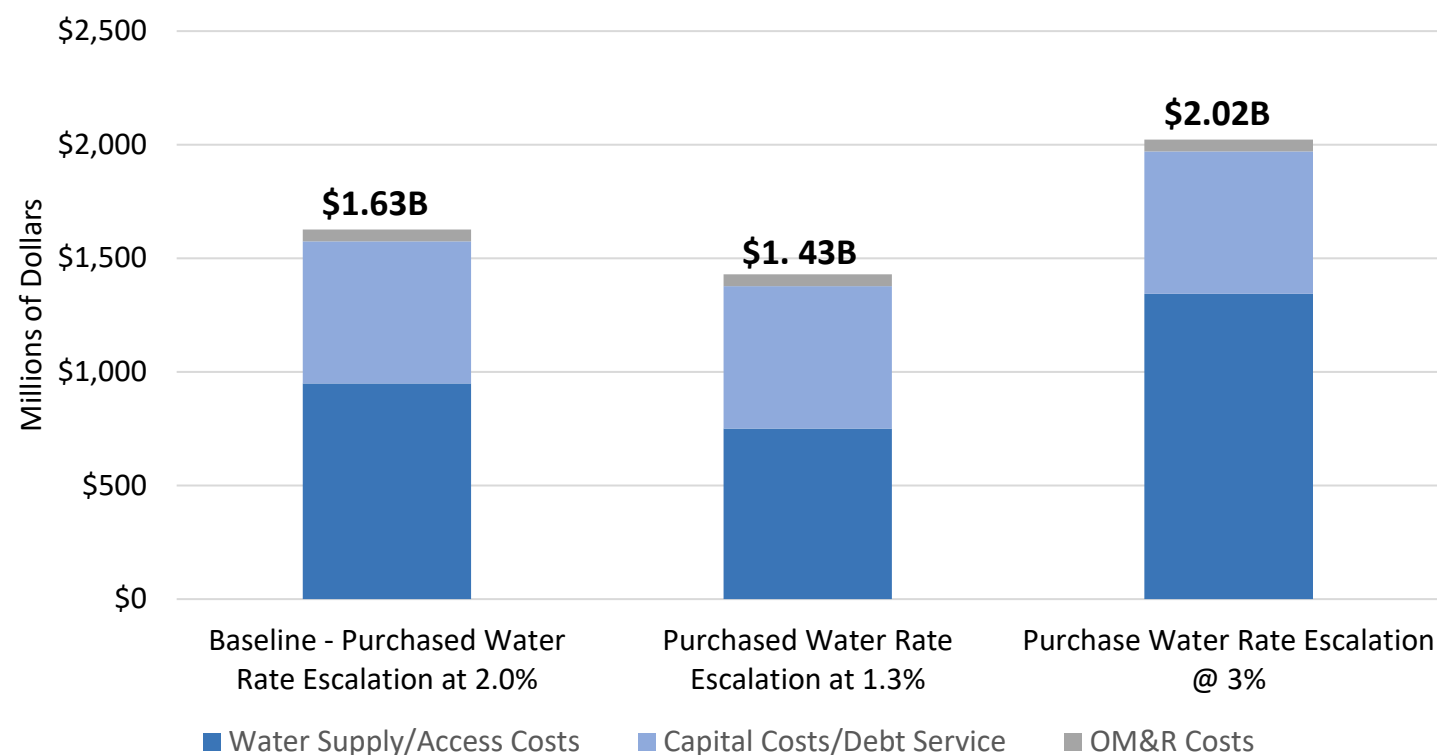
FUTURE COST INCREASE SENSITIVITY



CDWM Alternative

The greatest risk to program costs for the CDWM Alternative is associated with potential increases in the future cost for purchase of treated water from Chicago. A decrease in the purchased water escalation rate to 1.3%/year as suggested by the City of Chicago will result in a reduction in the Total Cost of Water of about 12%. An increase in the purchased water escalation rate to 3%/year would yield about a 24% increase in the 50-year Total Cost of Water.

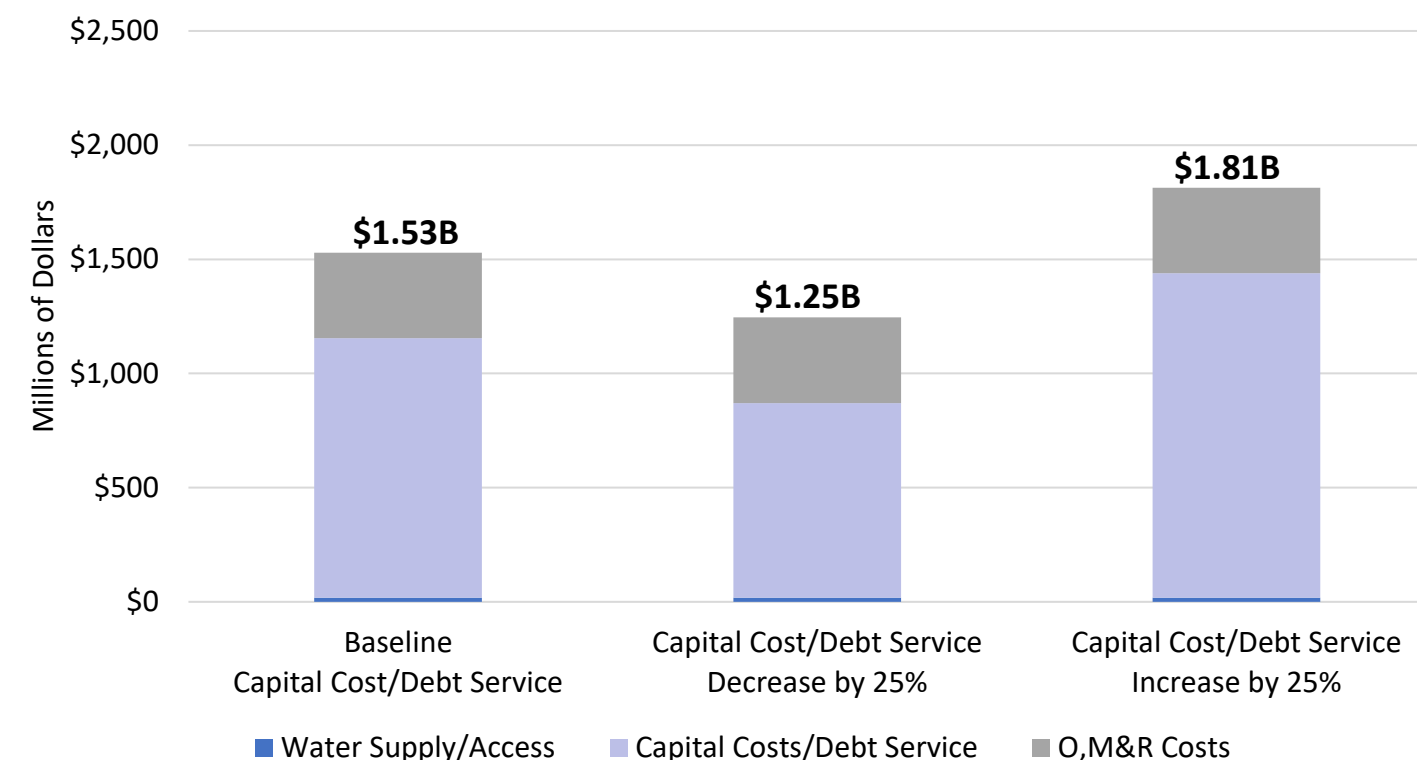
CDWM Alternative (30 MGD) - 50-year Total Cost of Water



New Indiana Intake Alternative

The greatest risk to program costs for the New Indiana Intake Alternative is associated with higher than expected capital costs/debt service for the required infrastructure improvements. A 25% decrease in estimated capital costs/debt service (consistent with the level of contingency currently being carried in the cost estimates) would decrease the 50-year Total Cost of Water by about 19%. An 25% increase in the capital costs/debt service for the Indiana Intake Alternative would yield about a 19% increase in the 50-year Total Cost of Water.

Indiana Intake Alternative (30 MGD) - 50-year Total Cost of Water



Bottom Line: There is greater sensitivity for increases in future costs with the CDWM Alternative.



Joliet Alternative Water Source Program

JOLIET'S LEVEL OF CONTROL

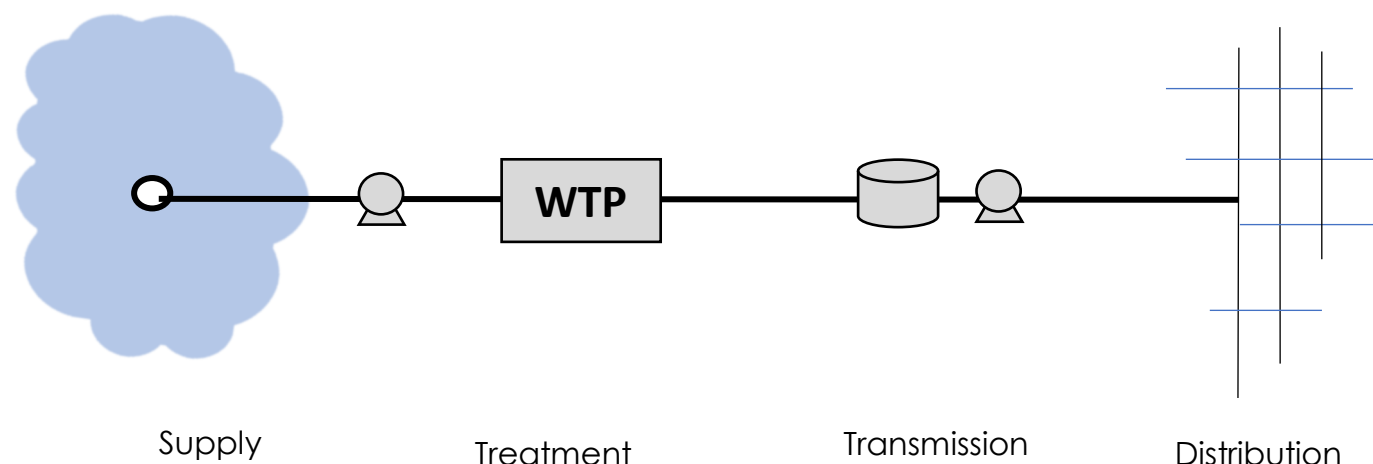


CDWM Alternative



New Indiana Intake Alternative

Control of infrastructure and utility decisions related to the supply and treatment of water differs between the two alternatives. For the CDWM Alternative, Joliet would have the opportunity to participate in Chicago's Advisory Council but will not have direct control over supply & treatment. With the New Indiana Intake Alternative, Joliet would have full control of the overall water supply, treatment, transmission, and distribution system.



JOLIET'S LEVEL OF CONTROL

Supply Treatment Transmission Distribution

CDWM Alternative:



New Indiana Intake Alternative:



CDWM Alternative

Control Considerations

New Indiana Intake Alternative



Full Control over Program Implementation

Under the CDWM Alternative, Joliet will have to coordinate with Chicago on the connection to the South Tunnel Zone and work at the Southwest Pumping Station/Durkin Park site. For the New Indiana Intake Alternative, Joliet will have full control of factors related to project design, permitting, construction, and start-up.



Water Treatment Process Decisions

Under the CDWM Alternative, Joliet will not have control of decisions related to the treatment of Lake Michigan water. Under the New Indiana Intake Alternative, Joliet will control decisions related to the treatment of its water.



Supply/Treatment Infrastructure Improvements

Under the CDWM Alternative, Joliet will not have control over decisions related to possible future improvements to Chicago's intake, treatment, or tunnel facilities that could impact Chicago's cost to serve Joliet. Under the New Indiana Intake Alternative, Joliet will have full control of water supply and treatment.



Corrosion Control

Under the CDWM Alternative, Chicago will have control of initial measures to provide for optimal corrosion control in the system. Under the New Indiana Intake Alternative, Joliet will have full control of corrosion control measures.



Future Water Rates

Under the CDWM Alternative, the purchased water rate for Joliet will be based on annual cost of service calculations that reflect Chicago decisions related to system operation, staffing, and maintenance. Under the New Indiana Intake Alternative, Joliet will have primary control over decisions that will have the greatest impact on its overall cost of water.



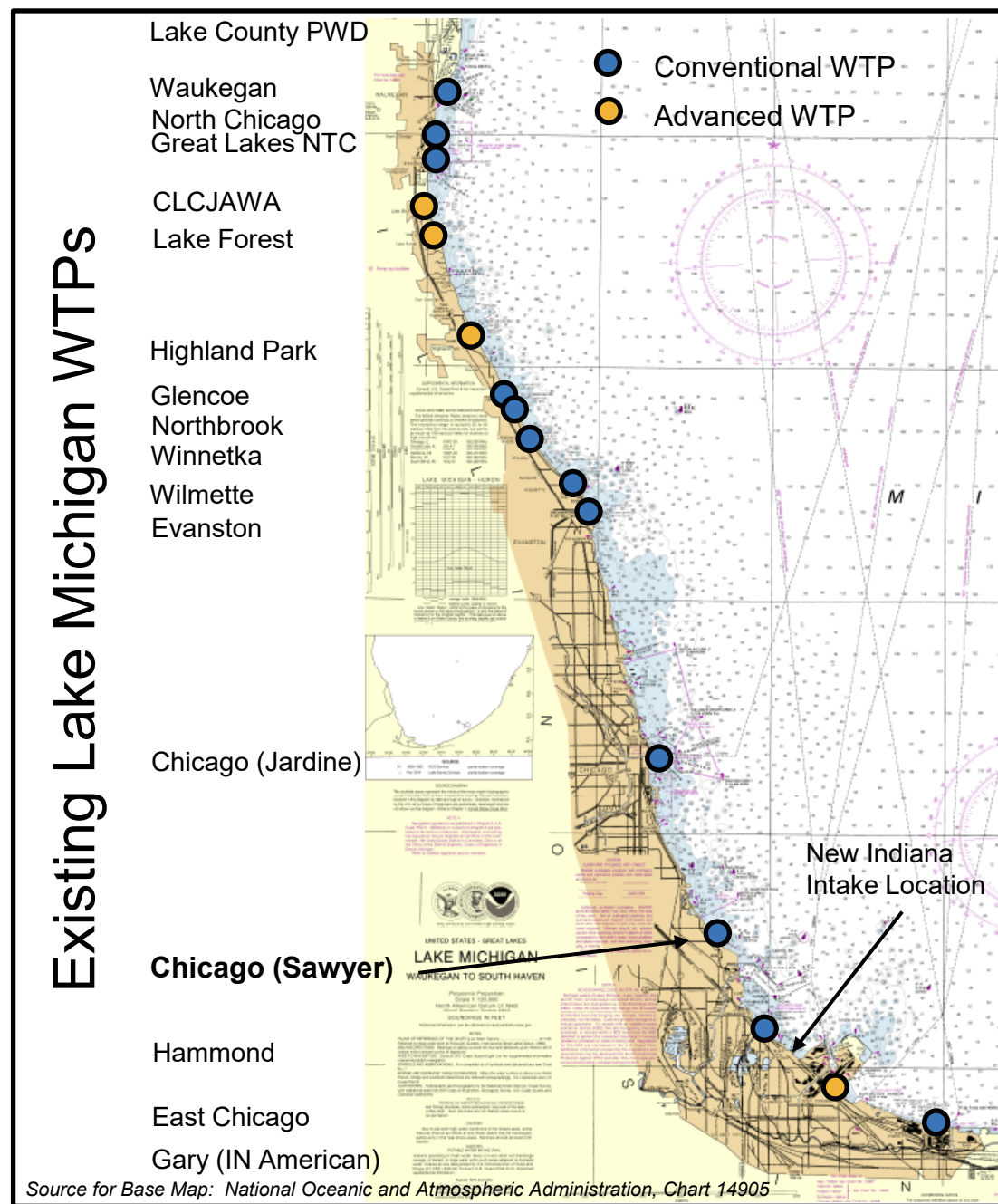
Bottom Line: Joliet will have greater control over factors related to the implementation, operation, and cost of its treated water supply under the New Indiana Intake Alternative.

Joliet Alternative Water Source Program

JOLIET'S OPERATIONAL RESPONSIBILITY



Both alternatives require the City to operate and maintain transmission infrastructure outside of City limits. Under the New Indiana Intake Alternative, Joliet will take on significant new responsibility and liability for intake and water treatment plant operations. While this would be a new responsibility for Joliet, many Illinois communities currently operate water treatment plants on Lake Michigan as shown below.



CDWM Alternative

New Indiana Intake Alternative



Responsibility/Liability



Source Water Protection/Intake Operation

Under the New Indiana Intake Alternative, Joliet will have responsibility for operating a lake intake, monitoring raw water quality at its intake, and responding to potential threats to water quality. Under the CDWM Alternative, source water protection and monitoring will be the responsibility of the City of Chicago.



Water Treatment

Under the New Indiana Intake Alternative, Joliet will have responsibility for the treatment of Lake Michigan water to meet all current and future water quality regulations. Under the CDWM Alternative, Joliet will have the benefit of Chicago's water treatment expertise.



Water Treatment Plant Staffing

Under the New Indiana Intake Alternative, Joliet will have to develop/hire staff qualified and licensed to operate a Lake Michigan water treatment system. Under the CDWM Alternative, Joliet will not need to add new water utility staff.



Maintenance of Water Transmission Main

Under both alternatives, Joliet will be responsible for the operation and maintenance of many miles of large diameter transmission main. Arrangements will need to be made with an external contractor to respond to events requiring maintenance or repair.



Maintenance of Backup Supply (Wells)

Under both alternatives, Joliet will need to perform monthly maintenance and sampling to maintain its wells as a reliable backup water supply for use in the event of an extended Lake Michigan supply outage.

Bottom Line: With the CDWM Alternative, Joliet will benefit from the water treatment expertise of Chicago and would not have any responsibility for operation and maintenance of supply and treatment facilities.

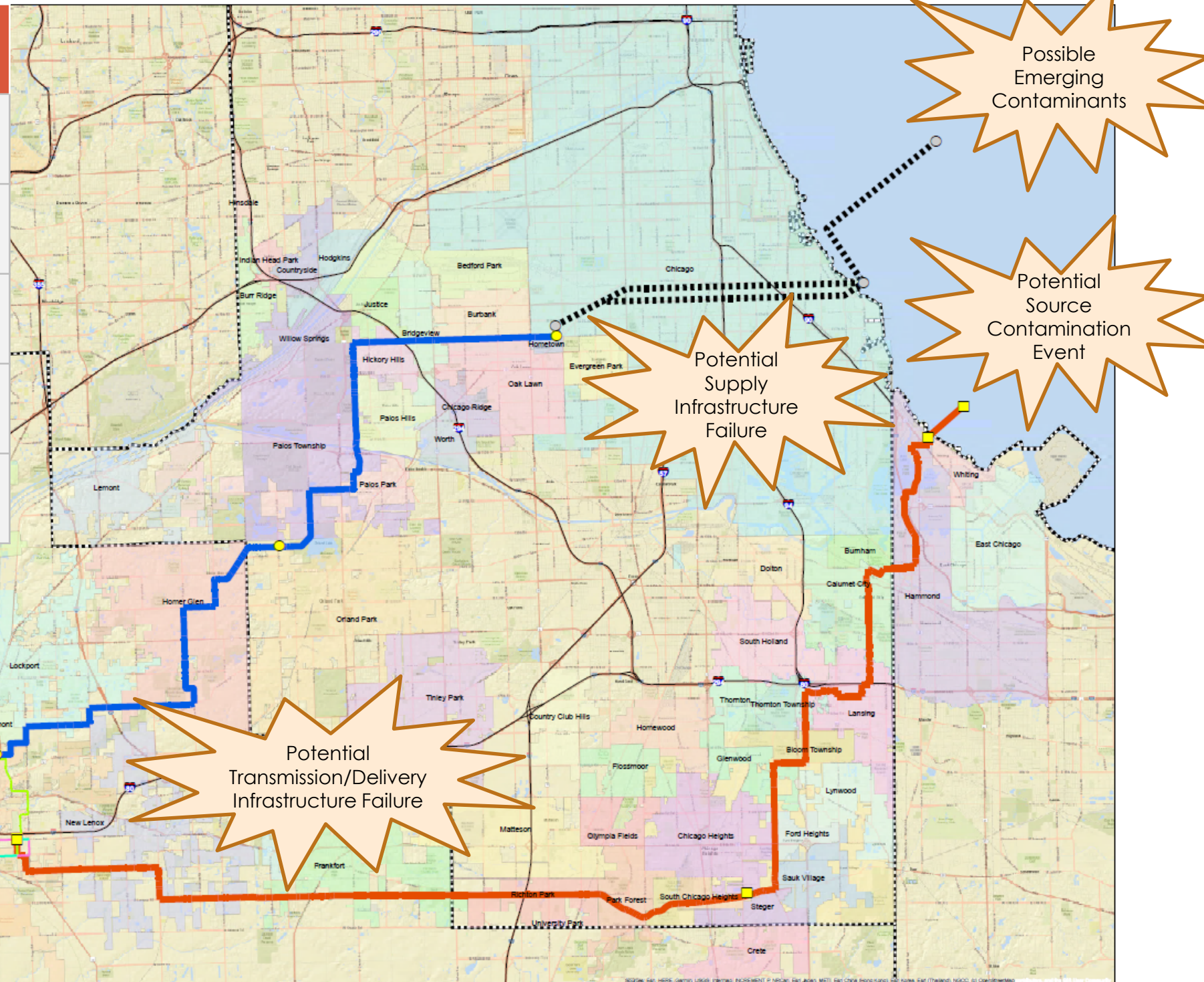
Joliet Alternative Water Source Program RELIABILITY/RESILIENCY



CDWM Alternative

New Indiana Intake Alternative

CDWM Alternative	Reliability/Resiliency Factors	New Indiana Intake Alternative
○	Ability to supply sufficient water to meet demands beyond current design capacity	○
+	Risk of/Potential for responding to source water contamination event	○
○	Ability to treat for emerging water quality contaminants	+
○	Risk of major water supply failure in aged infrastructure	+
○	Risk of major water transmission/delivery system failure in new infrastructure	○



Bottom Line: With the new infrastructure and advanced water treatment capability of the New Indiana Intake Alternative, there is greater reliability and resiliency.

Joliet Alternative Water Source Program COMPARISON SUMMARY

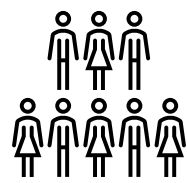


Decision Criteria	CDWM Alternative	New Indiana Intake Alternative
Risk to Schedule	While construction at the point of supply requires complex construction sequencing, the risk that the program will not be completed by 2030 is lower due to less complex construction contracting and permitting and lower magnitude of improvements.	Due to the magnitude and complexity of the construction sequencing there is less flexibility in the schedule resulting in greater sensitivity to potential delays. In addition, taking into account potential risks associated with interstate construction and regulation, there is a higher risk that the program will not be completed by 2030.
Cost Considerations	Less infrastructure is required to be constructed resulting in a lower debt burden for the City. Joliet would be a long-term wholesale customer of the City of Chicago at a wholesale rate based on cost of service. In the short-term, water rate increases are slightly lower for the Joliet only scenario. However, the savings provided by a regional approach are less because economies of scale do not apply to costs for the purchase of water. Also, there is greater sensitivity for increases in future purchased water costs due to multiple factors.	Significant infrastructure and capital expenditures are required resulting in a higher debt burden for the City. In the short-term, water rate increases are slightly higher for the Joliet only scenario. However, the savings provided by a regional approach are greater because of the economies of scale associated with capital improvements versus purchased water costs. In the long-term, annual cash flow becomes significantly lower after the debt service from capital improvements is paid off in 2065. While the total cost of water may be affected by changes in capital costs and debt burden, it is less sensitive to potential increases in future costs .
Joliet's Level of Control	Joliet would not have control over water production/treatment and future water rates. Joliet would be able to provide input to Chicago through Chicago's proposed Advisory Council .	Joliet will have total control over factors related to the program implementation, water treatment, operations, and future water rates associated with the new water supply.
Joliet's Operational Responsibility	Joliet would not have any responsibility for operation and maintenance of supply and treatment. Joliet will benefit from the water treatment expertise of Chicago as well as being part of an established, high-quality regional water system that serves millions of people.	With significant new infrastructure designed, built, financed, owned, and operated by the City of Joliet comes greater responsibility and liability . Joliet will hire qualified operators and maintenance staff and train existing staff to operate new supply and treatment facilities.
Reliability/Resiliency	Chicago has demonstrated that they have maintained their existing infrastructure and can effectively respond to source water protection events that could impact raw water quality. However, since Chicago's infrastructure is older and does not treat for emerging contaminants, reliability and resiliency is lower than a brand-new system with advanced treatment.	With brand-new infrastructure and advanced water treatment capability, there is greater reliability and resiliency . However, Joliet will need to be diligent and utilize its partnership with Hammond in source water protection to avoid disruption to service.

Joliet Alternative Water Source Program

OTHER CONSIDERATIONS

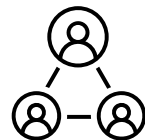
Decision criteria have been assessed by the Project Team as described previously. However, there are other criteria that must be considered in the selection of a water source alternative for Joliet that cannot be easily assessed.



Public Support
Comments from the public, received to date, have been minimal and therefore, public support for either alternative is difficult to gauge. The public comment period has been extended to January 19, 2021 to allow additional time for the public to provide input.



Political Support
Communication with Illinois and Indiana state and federal legislators has indicated that they are supportive of the City's efforts to find a solution to its drinking water needs. To date, the legislators contacted have not expressed objections to either of the two alternatives. Outreach is ongoing and, if support changes, this information will be conveyed to the City Council.



Regional Partner Support
Based on the regional outreach performed as part of the 2020 Evaluation, there does not seem to be a preference amongst the regional communities between the two alternatives. Outreach is ongoing and, if support changes, this information will be conveyed to the City Council.



Water Purchase/ROW Access Partner Relationship
Both alternatives require a long-term relationship governed by an intergovernmental agreement. This relationship is a critical component of the alternatives. While the legal terms and conditions of the agreement have been established, the future relationship between the parties will depend upon ongoing transparency and collaboration.



Uncertainties
While many uncertainties have been addressed during the 2020 Evaluation, there is some information that we will not know prior to making this decision including details related to future regulations, legislation, and stakeholder support.



CONCLUSION

The selection of an alternative water source will be the most significant and costly decision that the City of Joliet will make this century.

Between the Prospectus documents, Basis of Design Report, many technical evaluations attached to the Basis of Design Report, and this comparison document the City Council has been provided with the information to make an informed and educated decision on Joliet's new water source alternative. This process was conducted in an open and transparent manner since initiation of the study in 2018 via the program website, multiple City Council Workshops and in-person and virtual Stakeholder Meetings. At the November 2020 City Council Workshop, the Project Team presented the results of the 2020 Evaluation for both water source alternatives accomplishing the goal of reducing uncertainty by further defining each alternative and answering a number of critically important questions through more detailed conceptual engineering analysis, negotiation of preliminary agreement terms with potential water supply/access communities, identification of the funding required based on updated program costs, intensive outreach to potential regional partners, detailed analysis of risks and governmental advocacy.

Thank you to the City of Chicago and City of Hammond, for supporting Joliet in its efforts to obtain a new water source.

Thank you to the residents of Joliet who have engaged in this process.

Thank you to Joliet's potential regional partners who have participated in this evaluation to find a regional solution to a regional problem.

Thank you to the City Council for supporting staff and the project team and taking on the responsibility of solving this problem for the City of Joliet.

