

Consulting Engineers of Alberta

**2023 Partnering with Industry
Symposium** January 12, 2023

PRESENTERS:

- Don Hawkes – Director, Drainage Project Management and Engineering
- Saif Molla – Manager, Planning and Engagement
- Heather Zarski – Manager, Integrated Planning
- Heather Piano – Senior Manager, Water and Drainage Supply Chain



EPCOR Drainage Services 2023 Capital Program

Presenter - Don Hawkes

2022-2024 Drainage Capital

Neighbourhood Renewal

- renew aging sanitary and storm water infrastructure in mature neighborhoods

Drainage Expansion

- build new infrastructure to support growth and customer requirements

Drainage Rehabilitation

- rehabilitate or replace existing assets at the end of their useful life

Environmental Quality Enhancement

- address current and upcoming regulatory requirements

Flood Mitigation

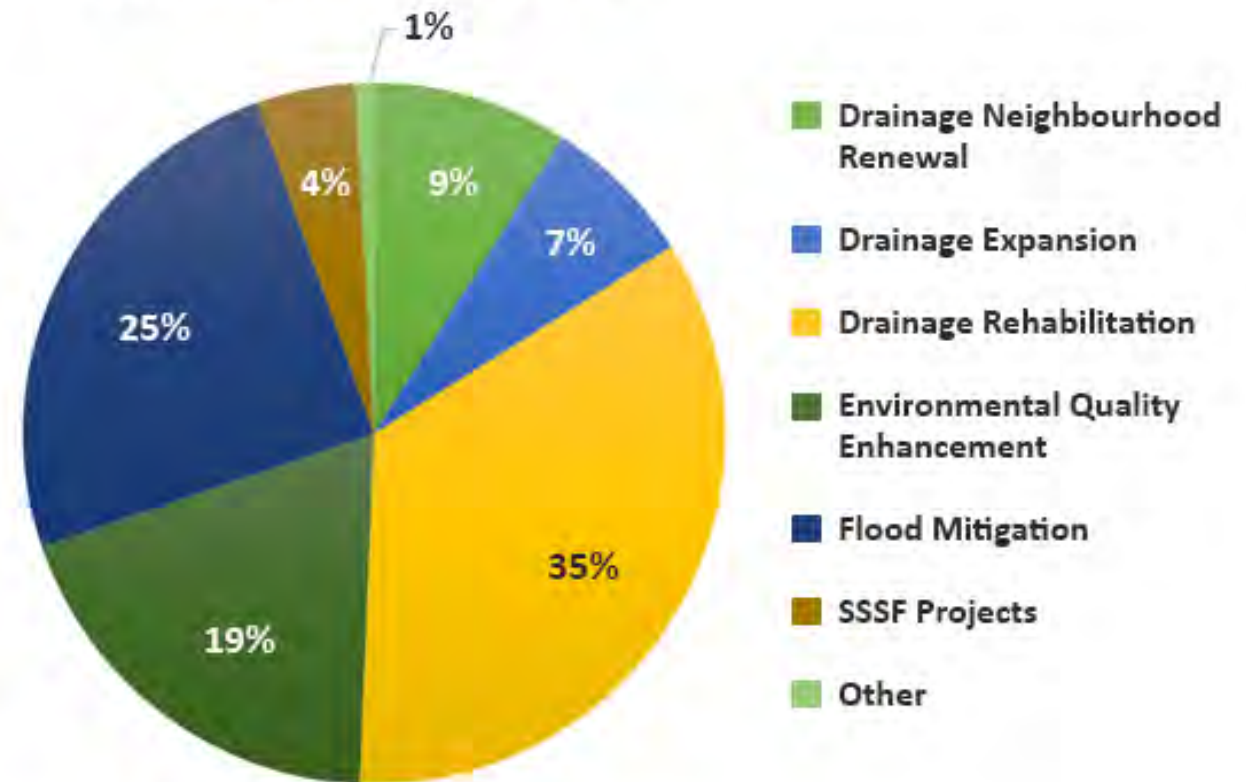
- SIRP Dry Pond Program, Low Impact Development, Proactive Pipe Relining, Manhole Relining

SSSF Projects

- build new sanitary trunks within the city to support growth, funded by customer contributions through the SSSF

Other

\$835M From 2022 to 2024





EPCOR WWTP 2023 Capital Program

Presenter – Saif Molla



2022-2024 Capital Priorities

Reliability and Life Cycle

- Digester 4 Upgrades
- PE Channel Bypass Chamber Upgrades
- Diversion Structure Structural Rehabilitation
- Electrical Buildings 1 & 2
- Dewatering Facility Options
- Expand Flare Capacity

Support Growth

- Secondary inDENSE™ Upgrade

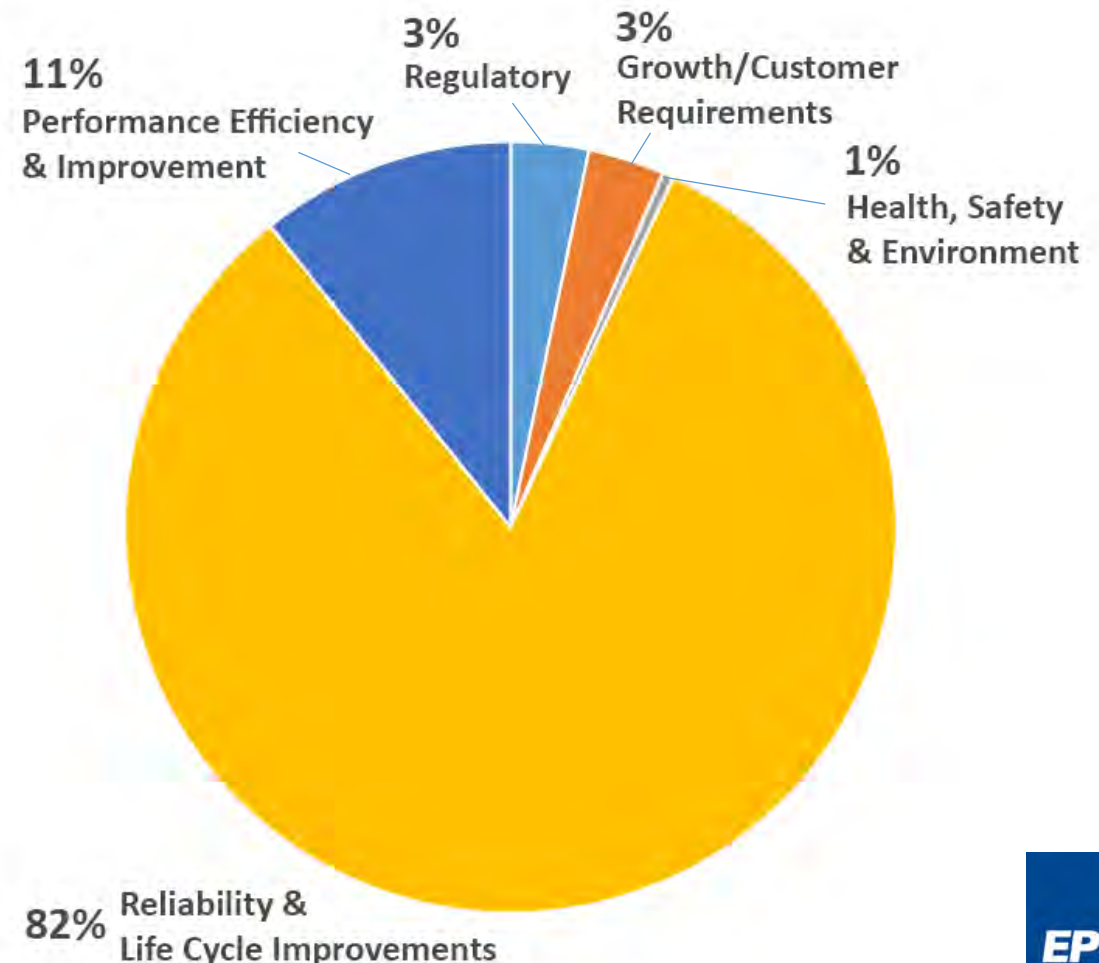
Performance Improvement/Efficiency

- Secondary Aeration Blower Upgrades
- Laboratory Facility Consolidation

Regulatory Compliance

- Odour Control Improvements

\$172M from 2022 - 2024



2023 projects in FEED/planning stage

Edmonton Wastewater Treatment

- Utility Rack West
- Future Digester Upgrades
- NSR Flood Protection
- Dewatering Options
- Biogas Utilization Options
- EWMC Groundwater Transfer
- Future PE Channel Upgrades
- Future Secondary Aeration Delivery System Upgrades
- Validation of secondary clarifier baffles, inDENSE™, lagoon cell relining





EPCOR Water Services 2023 Capital Program

Presenter – Heather Zarski



2022-2026 Capital Priorities

Reliability and Life Cycle

- Risk-based water main renewal
- Flood protection for water treatment plants (WTP)
- WTP and reservoir upgrades to reduce risk of asset failure
- Transmission pipeline inspection

Support Growth

- System expansion

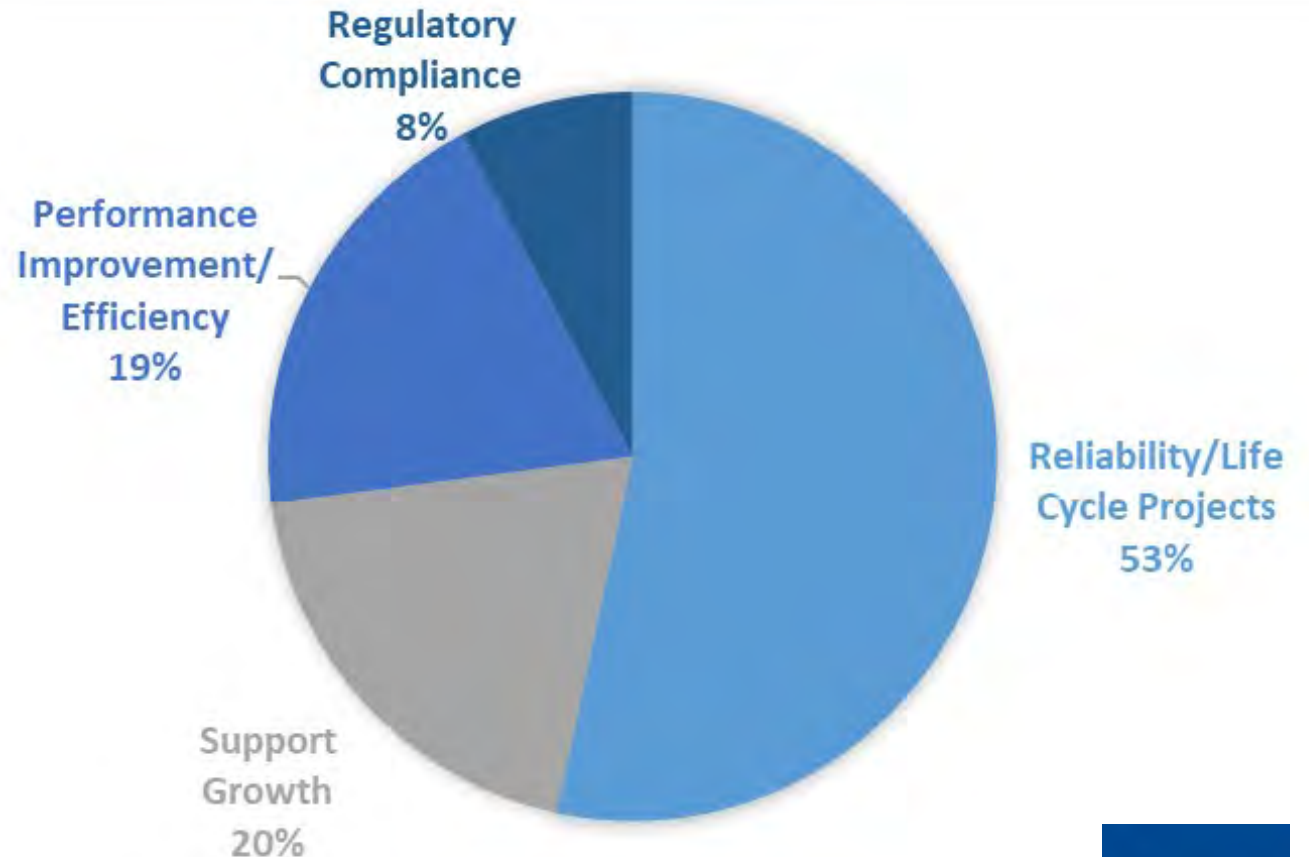
Performance Improvement/Efficiency

- Installation of Advanced Metering Infrastructure (AMI)
- Water main cathodic protection

Regulatory Compliance

- Lead service line replacement

\$430 M from 2022 - 2026



2023 Projects: Distribution & Transmission

Yellowhead Trail - Water Main Relocations (4 km)

- 2022/23 – Design (awarded)
- 2023 – Construction

41 Ave. SW & Calgary Tl. – Transmission Installation (1.2 km)

- 2022/23 – Design RFP (Dec. 13th to January 6th)
- 2024 – Construction

Private Development Transmission Mains

- 2023: Routine transmission extensions as part of subdivision staging
- Developer managed under City of Edmonton servicing agreement framework

LRT Relocations

- Valley Line (2023) and Capital Line (Future)
- Design primarily in-house



2023 Projects: Water Treatment Plants

Rossdale Reservoir Cell – structural rehabilitation and roof replacement

- Evaluate condition of reservoir cell and develop rehabilitation scope
- RFP in Q1

EL Smith Electrical Resiliency Study

- Evaluate future demands, on-site power distribution, condition assessment etc.
- RFP in Q2

EL Smith Low Lift Pump House Electrical Upgrade

- Relocate existing substation and replace 4160V switchgear and transformers
- RFP in Q3

Multiple discipline program scopes

- Mechanical, process, electrical, civil and structural upgrades
- Smaller scope projects at Rossdale, EL Smith and reservoir sites
- RFPs will vary throughout the year





Design Standards Modernization

Presenter – Heather Zarski

Edmonton City Plan

- Long-range strategic planning document that guides the city as it grows to 2 million people
 - Approved by Council Dec. 7, 2020
 - Municipal development plan, transportation master plan and strategic policy document
- REDEVELOPMENT FOCUSED

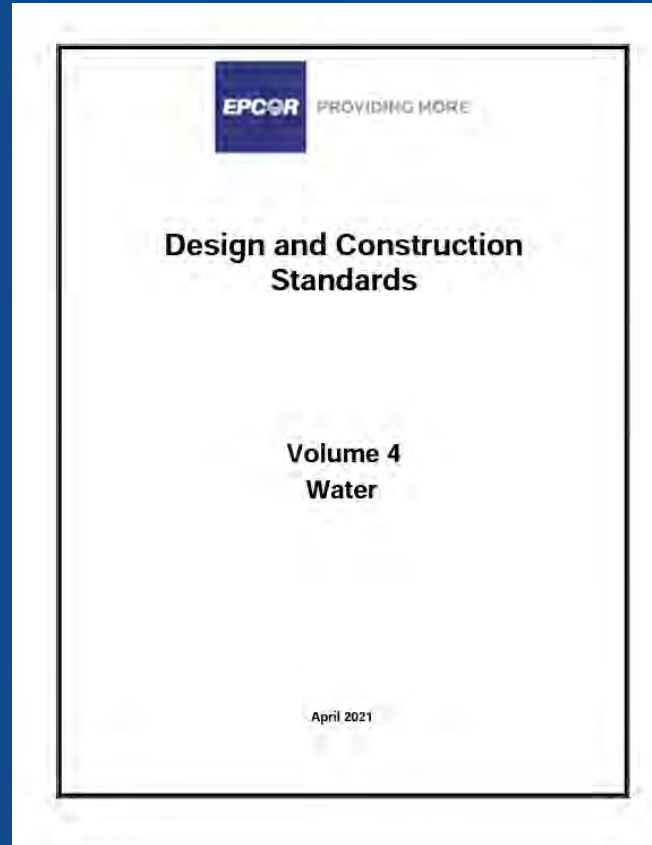


EPCOR Implication: We need to align our processes to support and enable growth for greenfield and infill. We want to prudently size new infrastructure and maximize the use of existing infrastructure.

EPCOR Water & Drainage Design Standards

City of Edmonton Design and Construction Standards

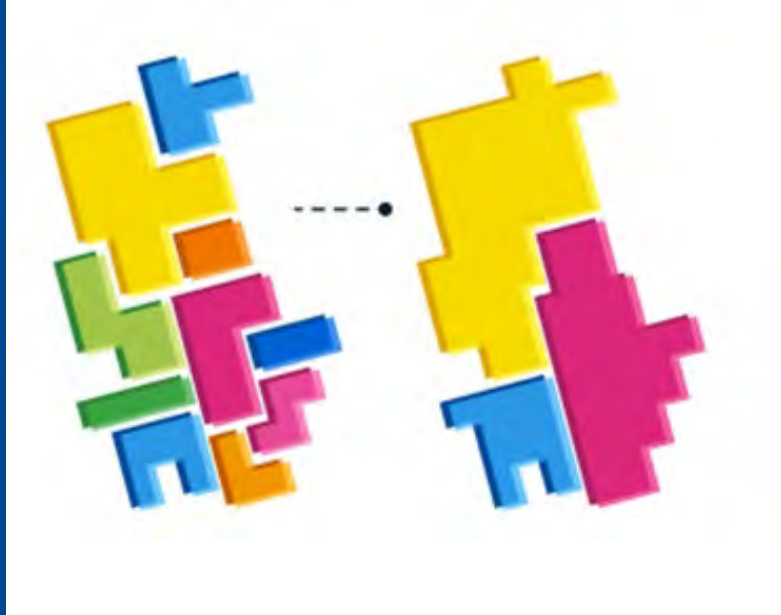
- Volume 3 – EPCOR Drainage
- Volume 4 – EPCOR Water



EPCOR Design Standards	Water	Sanitary	Storm
Fire Flow	X		
Hydrant Spacing	X		
Water Consumption & Sanitary Generation	X	X	
Inflow and Infiltration		X	X
Runoff Coefficient		X	X
Storm Service Pipe			X
On-site Storage			X

Design metrics are primarily tied to zoning and were developed for greenfield construction
Result → barrier for infill development and over-built infrastructure in some cases

Zoning Bylaw Renewal



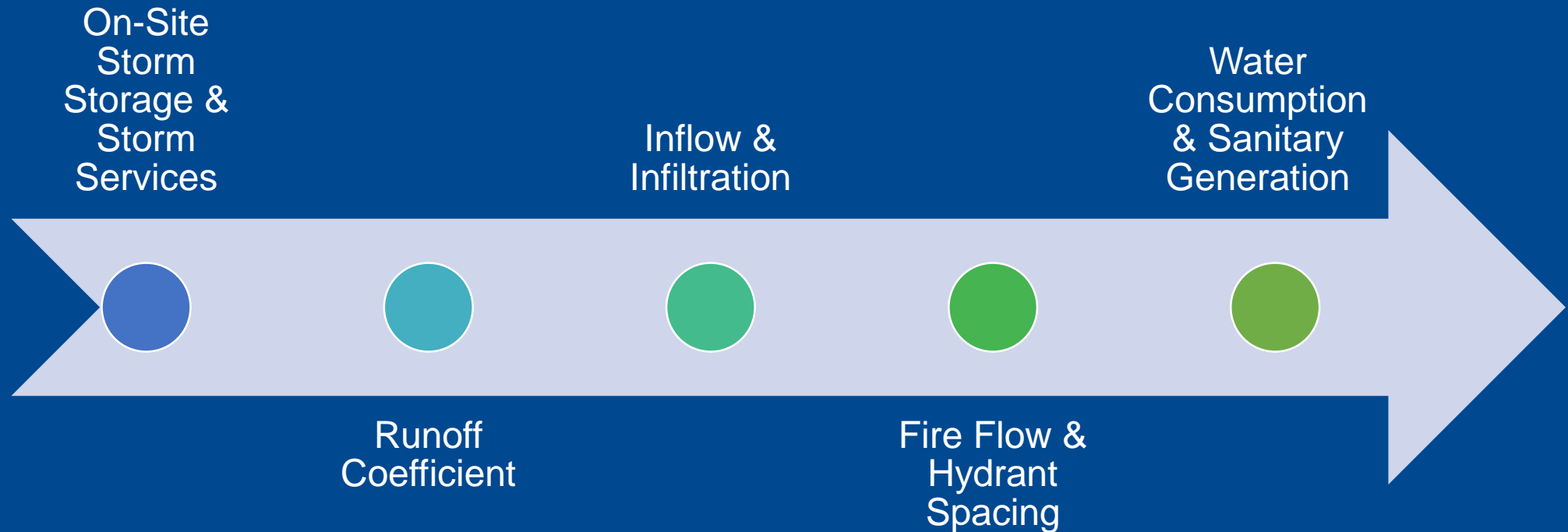
- Fewer and broader zones
- Wider variety of uses and building zones in a zone
- EPCOR has been active participant throughout the development

- EPCOR's initial approach was focused on updating design standards against new zones, but since have recognized this would result in oversizing of infrastructure
- Zoning no longer the only appropriate surrogate for infrastructure design

EPCOR Implication: A modernized approach to providing design standards (not only tied to zoning) is required to prudently design infrastructure

Maturity of Analysis and Modernization Solutions

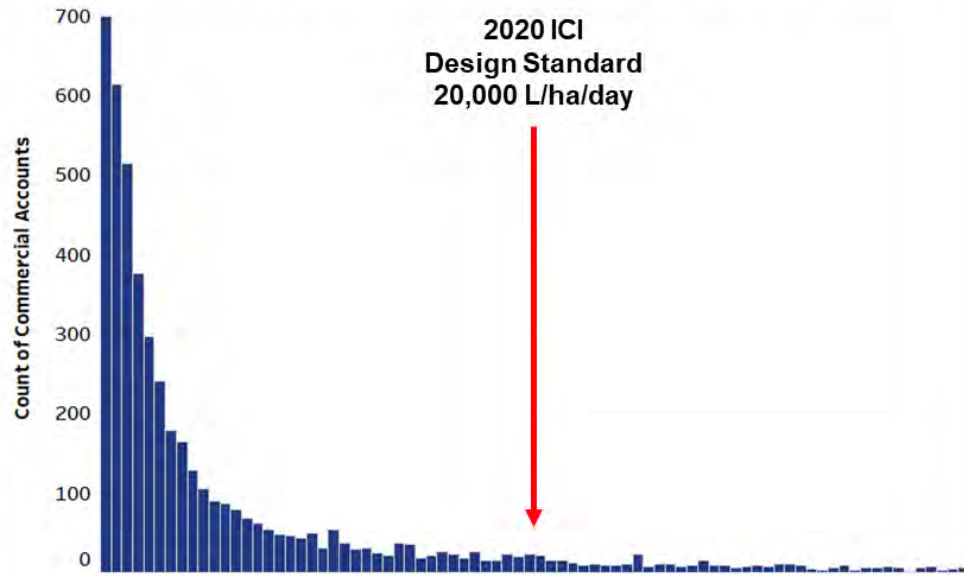
Solutions must work for all development scales - single parcel, block, neighbourhood and area



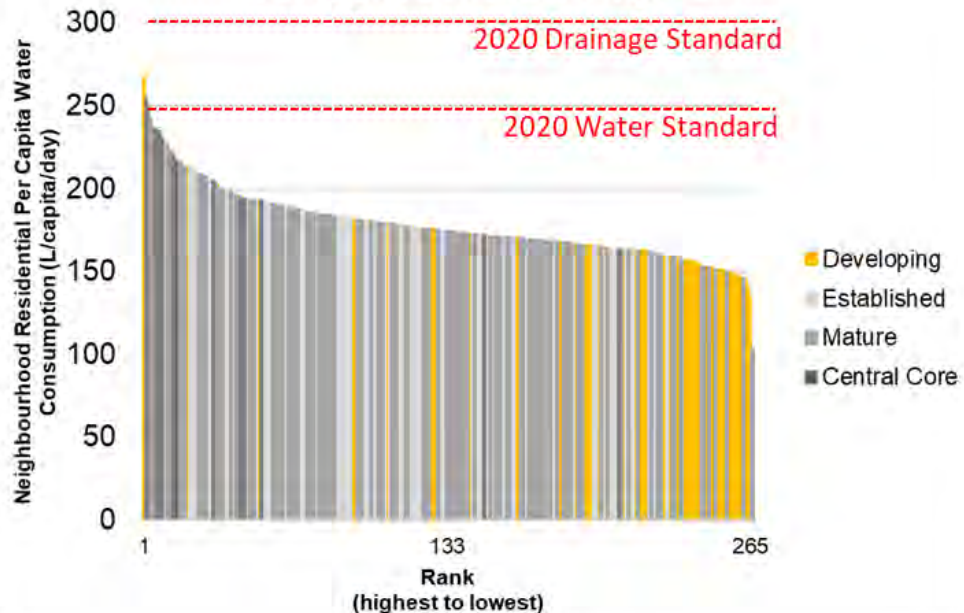
Water Consumption & Sanitary Generation

- EPCOR has robust data by industry and neighbourhood characteristics and can do comparative analysis for development at start of planning process

Histogram of 2019 Commercial Accounts (Lot Area)



Distribution of 2019 Neighbourhood Per Capita Water Consumption



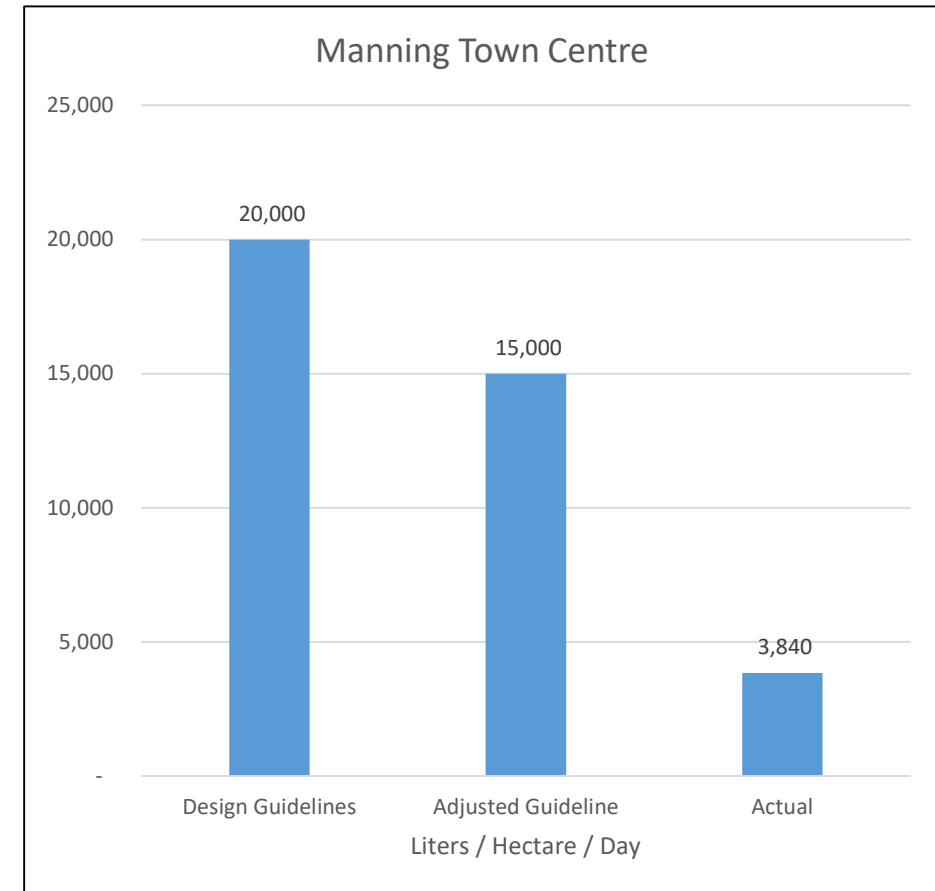
Edmonton's Changing Water Use

Water Use Trends and Design Guidelines
Discussion Paper

EPCOR Water Services Inc.
One Water Planning

Prepared: June 2021

Example: Manning Town Centre



Future Workshops: Design Standards Modernization

- EPCOR would like to engage on how the customized approach would impact the development process
- Please reach out to hzarski@epcor.com by the end of February if your consulting firm is interested

EPCOR Design Standards	Water	Sanitary	Storm
Fire Flow	X		
Hydrant Spacing	X		
Water Consumption & Sanitary Generation	X	X	
Inflow and Infiltration		X	X
Runoff Coefficient		X	X
Storm Service Pipe			X
On-site Storage			X

Utility of the Future: Alternative Procurement

Presenter - Heather Piano

What is EPCOR's “Utility of the Future” project

- Drainage integration had been one of EPCOR's 4 strategic priorities for a number of years since 2017
- The integration has been successfully executed, but now what do we look like as a “water utility” in the future
- A few EPCOR leaders had the opportunity to visit a couple of UK utilities in 2019 to observe their journey to being a Utility of the Future
- An initiative was started in mid-2020 to develop a Utility of the Future vision for the EPCOR water utilities (EPCOR USA also part of the project), in partnership with Stantec
- Two projects were started as a result of this work

Key Focus Areas (gaps)

Customer engagement & experience

What is the targeted level of service delivery?
What is the targeted level of customer experience?
What is the targeted level of commitment for Smart Cities?



Asset management & optimization

What is the targeted level of risk management?
What is the targeted level of asset availability and reliability?



Sustainability & resource efficiency

What is the targeted level of direct reduction in carbon and nutrients?
What is the targeted level of indirect reduction in carbon footprint?
What is the targeted level of resource reuse and recovery?



Procurement, partnership, & alliances

What is the targeted level of ownership for capital delivery?
What is the targeted level of business process changes?



Situational awareness & adaptability

What is the targeted level of automation and autonomous operations?
What is the targeted level of data quality, availability, and integration?



Investment planning & optimization

What is the targeted level of investment to gain capabilities?
What is the targeted level of financial efficiency and resiliency?

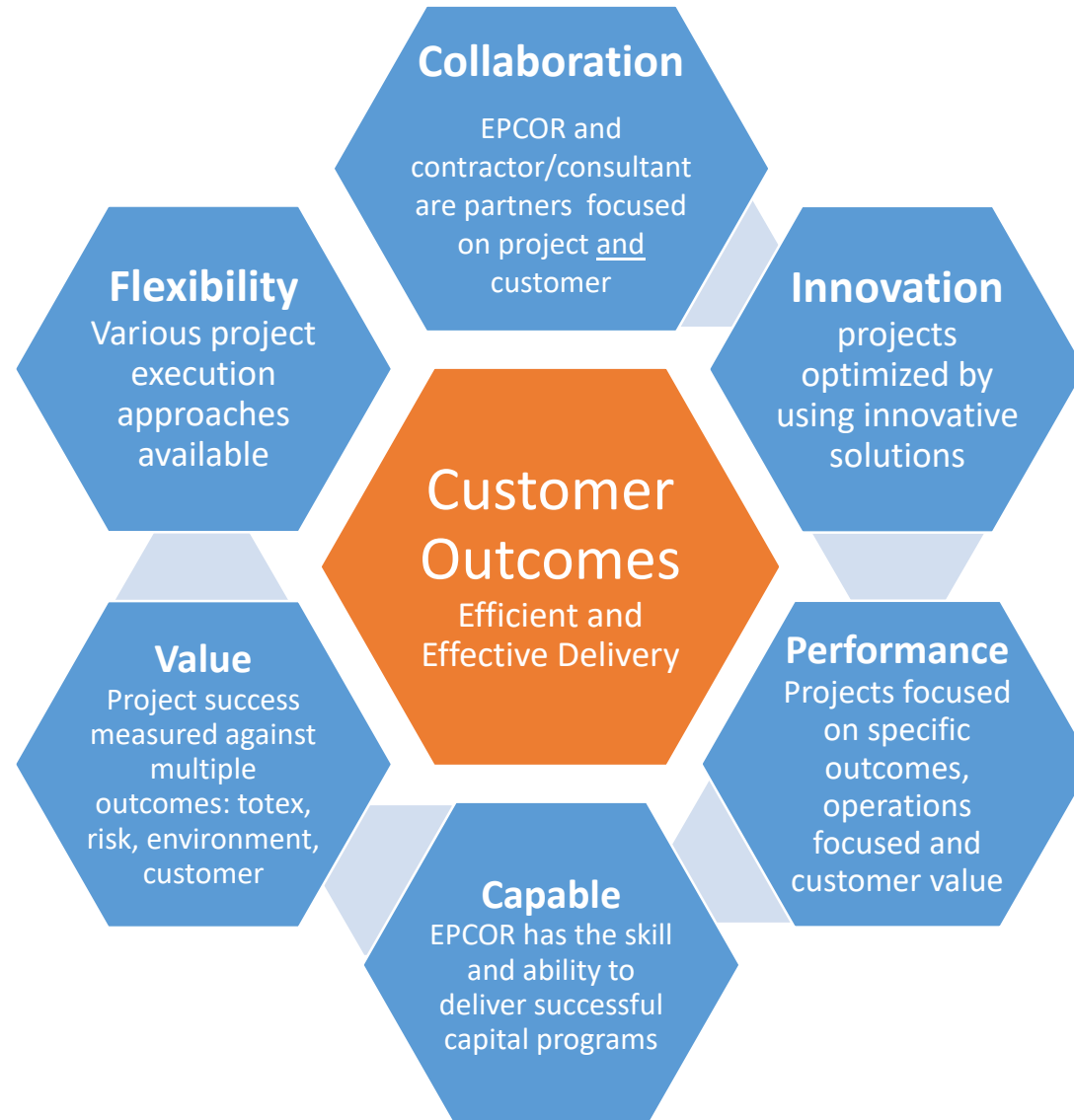
U.K. vs EPCOR

- EPCOR typically uses a traditional approach to capital projects
 - Design/Bid/Build
 - Focus on capital costs
- UK utilities use a much more integrated approach
 - Partnerships and alliances
 - Focus on a broad set of outcomes (TOTEX, customer considerations, sustainability, etc.)
 - Much greater use of incentives/penalties

Procurement Models

Traditional	Capable Owner	Alliance Model	Enterprise Model (Project 13)
<ul style="list-style-type: none">• Focus<ul style="list-style-type: none">• Project delivery• Lowest project costs• Owner has complete control• Low risk transfer• Transactional and independent relationships	<ul style="list-style-type: none">• Focus<ul style="list-style-type: none">• Achieving project value and outcomes• Needs of operations and customer• Integrated team• Normally project or program based• Use of relationship or performance based contracts with a broader set of outcomes	<ul style="list-style-type: none">• Focus<ul style="list-style-type: none">• Long-term collaboration amongst key partners• Broad set of program outcomes established• Innovation and continuous improvement• Risks, rewards/profits are shared amongst alliance parties	<ul style="list-style-type: none">• Focus<ul style="list-style-type: none">• Evolution of alliance model• Longer-term integrated “enterprise” approach• Long-term incentivized arrangement that provides returns to partners for the life of the asset

Alternative Procurement Principles



Project Deliverables

Tools

- Project Delivery Matrix
- CMAR Standard Form Contract

Training

- Workshops
- Lessons Learned
- Guidelines

External Engagement

- IPD Market Readiness Assessment
- CEA and Construction Forums

Procurements

- IPD PE Channel – Posting Q1 2023
- Master Services Engineering Agreements – Posting Q2/Q3 2023