

EDMONTON'S CHANGING WATER USE

Water Use Trends and Design Guidelines Utility Committee Meeting – May 20, 2022

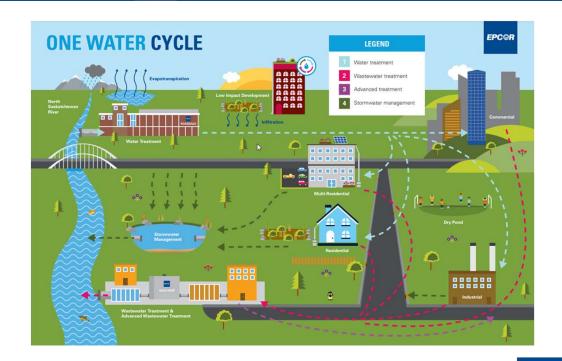
Presentation Overview

- One Water Planning Initiatives for 2022
- Edmonton Water Use and Sewer Generation Patterns
 - Total System
 - Residential
 - Multi Family
 - · Institutional, Commercial and Industrial
- Future Design Standard Updates



One Water Planning Current Focus Areas:

- Water Consumption and Sewage
 Generation Patterns (this presentation)
- Growth Strategies for City and
 Region alignment with City Plan
- 3. Fire Flow Protection Standards
- 4. Inflow & Infiltration Standards
- 5. Sanitary Integrated Resource Plan





Design Standards



City of Edmonton Design and Construction Standards

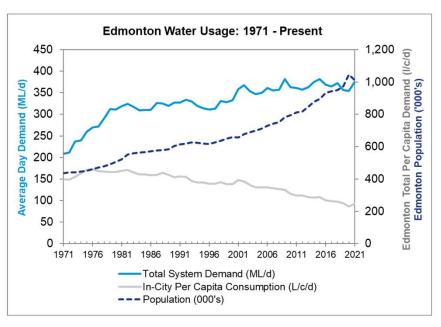
- Volume 3 EPCOR Drainage
- Volume 4 EPCOR Water

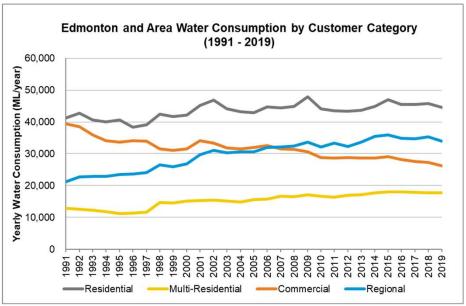
Supports Greenfield and Infill Development and Capital Projects completed by the Utility and City of Edmonton for Asset renewal and expansion

Seven Key Factors drive Infrastructure Sizing

- Water Consumption\ Sanitary Sewage Generation
- Fire Fighting Requirements
- Sanitary velocities to reduce H2S generation
- Climate Assumptions for Storms and Heat
- Stormwater Run-off from Parcels
- Inflow\Infiltration to Sanitary Network
- Growth Projections for Infill and Greenfield

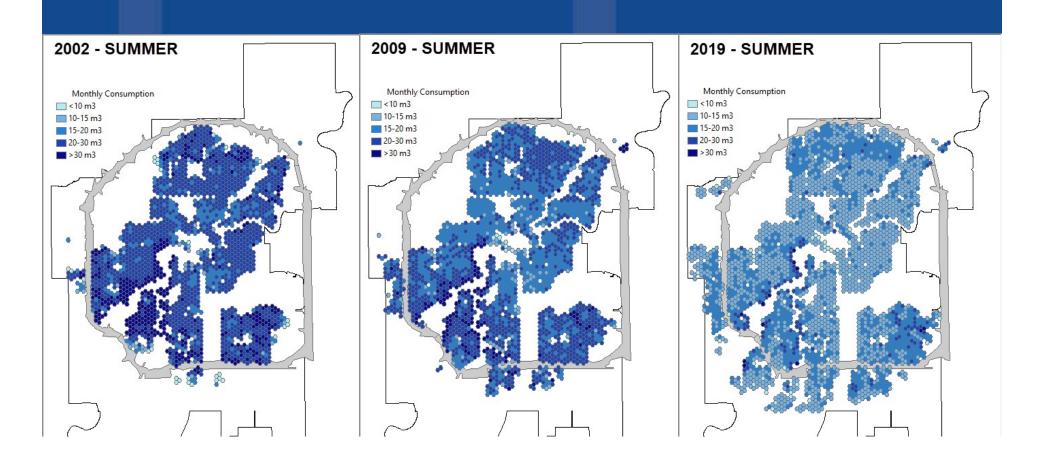
Edmonton Total Water Use In-City and Region



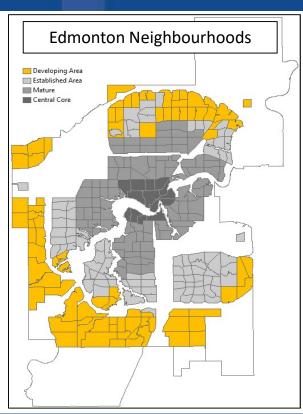


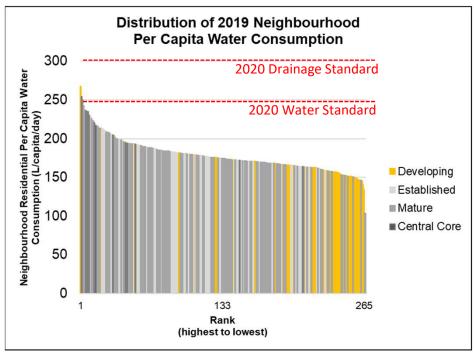


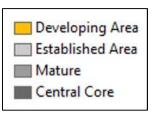
Geographic Trends in Domestic Water Use



Domestic Per Capita by Neighbourhood







EPC@R

Residential







Core
Oldest neighbourhoods

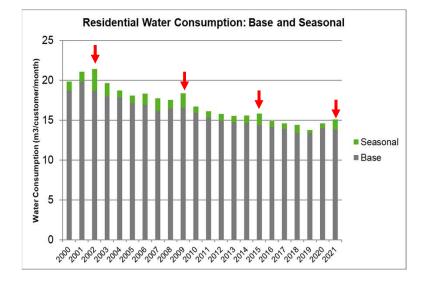
Mature Prior to 1970

Established 1970-1990



Developing 1990+





Hot Weather Years with Greater Lawn Watering shown by red arrows



Residential Water Consumption Standards

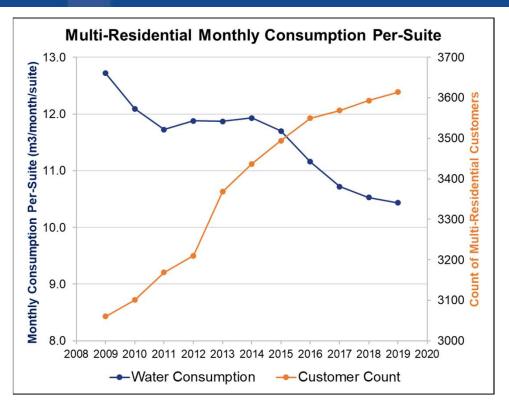


- Water = 300 l/c/d
- Sanitary = 350 l/c/d
- Water = 250 I/c/d
- Sanitary = 300 I/c/d
- Water = 220 I/c/d
- Sanitary = 220 I/c/d
- Water = ≤ **160** l/c/d
- Sanitary = ≤ **160** l/c/d
- Residential water consumption can be reported per capita or per dwelling using population density metrics.
- A typical dwelling is approx. 2.5-2.6 people per dwelling.
- 176 Litres/capita/day is approximately 13.4 m³/dwelling/month

$$\frac{\textit{Litres}}{\textit{person}* \textit{day}} * \frac{\textit{persons}}{\textit{lot}} * \frac{\textit{days}}{\textit{month}} * \frac{1 \textit{cubic metre}}{1000 \textit{Litres}} = \frac{\textit{cubic metres}}{\textit{lot}* \textit{month}}$$

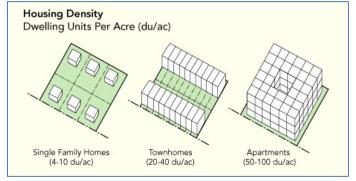
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Multi-Residential







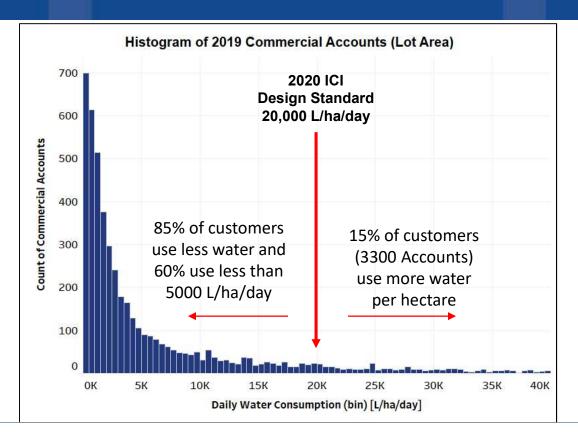


Single Family 13.4 m³/dwelling/month

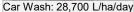
Apartment 10.4 m³/dwelling/month

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Industrial, Commercial, Institutional (ICI)

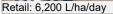






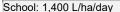














Warehouse: 400 L/ha/day



Alternative Design **Guideline for ICI** if Zoning or Building Use is Known

(will Update when Zoning **Bylaw** is updated)

Other

Office

Personal Care Services

Plastic Product Manufacturing

Religious Buildings

Research

Retail Shopping

Sales

Sports, Parks & Recreation

Temporary Shelters & Family Services

Transportation

Utilities

Warehousing and Storage

Apply metrics to gross lot area.

970

1.020

4,660

3,040

1.220

650

1,500

620

8,030

1,960

110

3,200

3 340

7,940

1,730

5,730

2,470

1,780

6 150

1.330

24,890

7,110

1,140

580

440

15,190

11.480

16,940

3,030

7,610

5.260

2,690

16 430

2.970

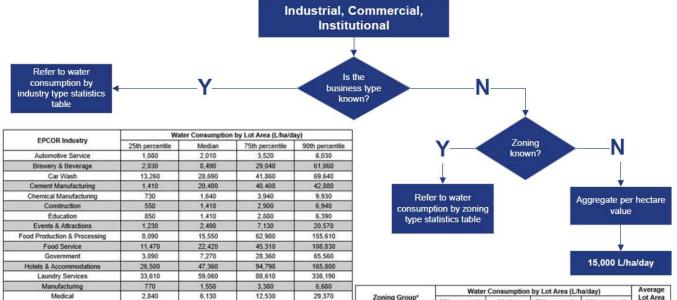
49,710

19.270

2,420

2,290

1,300



28,590

36,390

30,000

4,710

10,950

10,780

8,900

30 320

7.640

79,690

11,710

53,370

5,230

5,450

3,060

Zoning Group*	Water Consumption by Lot Area (L/ha/day)				Average
	25th percentile	Median	75th percentile	90th percentile	Lot Area (ha)
Agricultural and Reserve	60	630	2,140	4,130	9.200
Commercial	2,540	7,460	20,540	45,250	0.250
Direct Control 1	2,450	7,380	23,070	63,140	0.250
Direct Control 2	1,570	4,020	14,790	40,010	0.880
Industrial	700	1,480	3,270	7,350	1.120
Residential	1,350	5,990	16,280	26,540	0.550
Special Areas	3,730	16,210	67,130	155,180	0.530
Urban Service	680	1.510	3.840	9.230	2.850

*Special Areas and Direct Control Zonings may include a variety of water customer types (including industrial) due to the range of permitted uses.

> EPCOR Water Services Inc. One Water Planning



Industry and Stakeholder Engagement

Standards Modernization Discussions On-going with:

- City of Edmonton planning departments
- Urban Development Institute (UDI)
- Private Developers and Consulting Firms
- Sanitary Servicing Strategy Fund (SSSF) Committees
- Regional Water Customer Group
- Edmonton Metropolitan Region Board (EMRB)
- Industry Associations

Water and Drainage Design Standards updated in 2021 for Residential to 220 L/person/day.

New Option being provided for Developers at Start of Project to optimize the design standards for their specific development based on location and mix of development proposed

One Water Planning Team supports developer consultant in development of the design assumptions specific for their project



Continuing the Journey to Modernize the Design Standards

- Working with Developers to implement new approach to define design assumptions at start of planning process to reduce infrastructure oversizing
- Reviewing and validating plans for upcoming major sewer trunk and water transmission investments
- Preparing Report for Committee on Modernization of Fire Flow Standards with COE Emergency Rescue Services
- System wide monitoring to support development of future revised Inflow and Infiltration Standards for Sanitary network
- Process in place to update more frequently and in particular once new Zoning Bylaw is approved.



Discussion

Is there any additional information or analysis that Utility Committee would like to see regarding changing water and sewer consumption patterns in Edmonton?

Any other suggestions for outreach to the development community and/or the EMRB region?

