



### Agenda

- I. 2018 Disaster Risk Assessment (Draft)
  - i. Disaster Risk Explorer
- II. 2018 Business Impact Analysis

CITY OF CALGARY  
COUNCIL

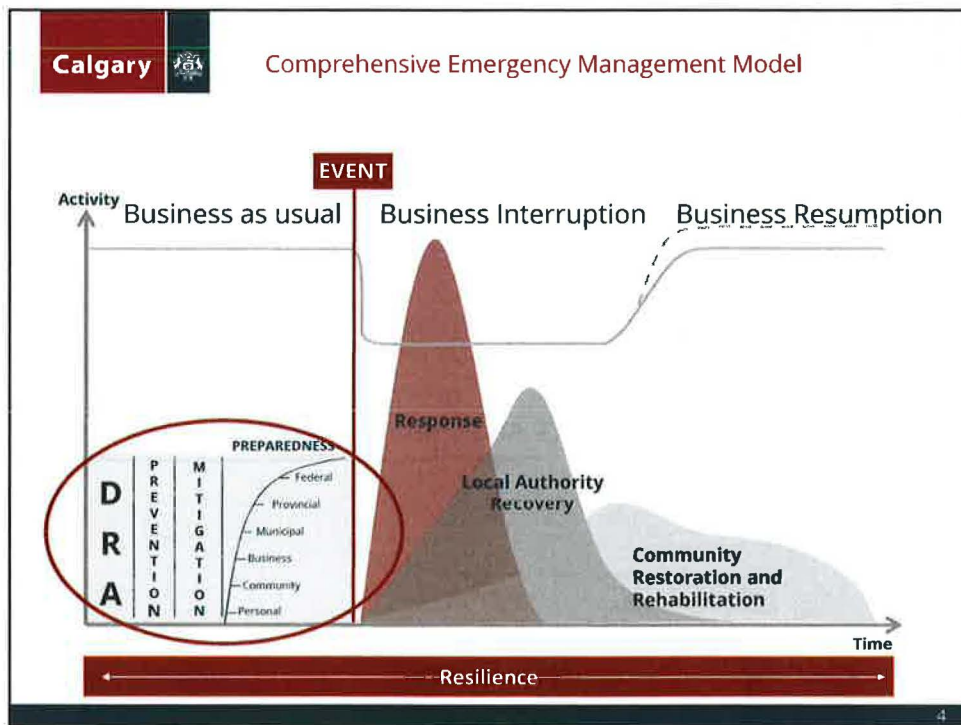
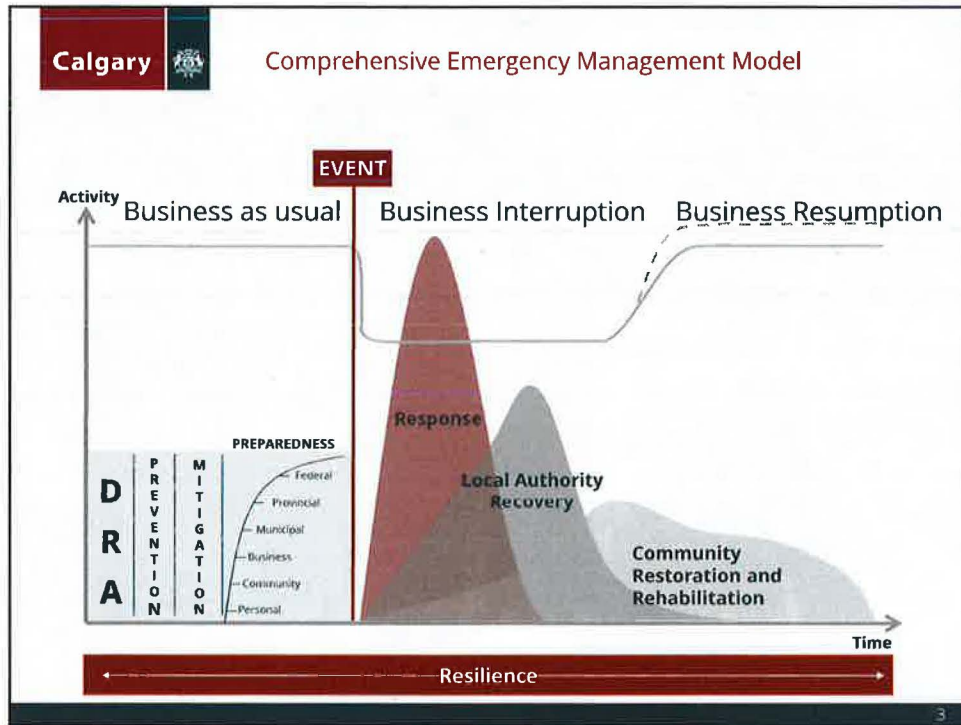
IN COUNCIL CHAMBER

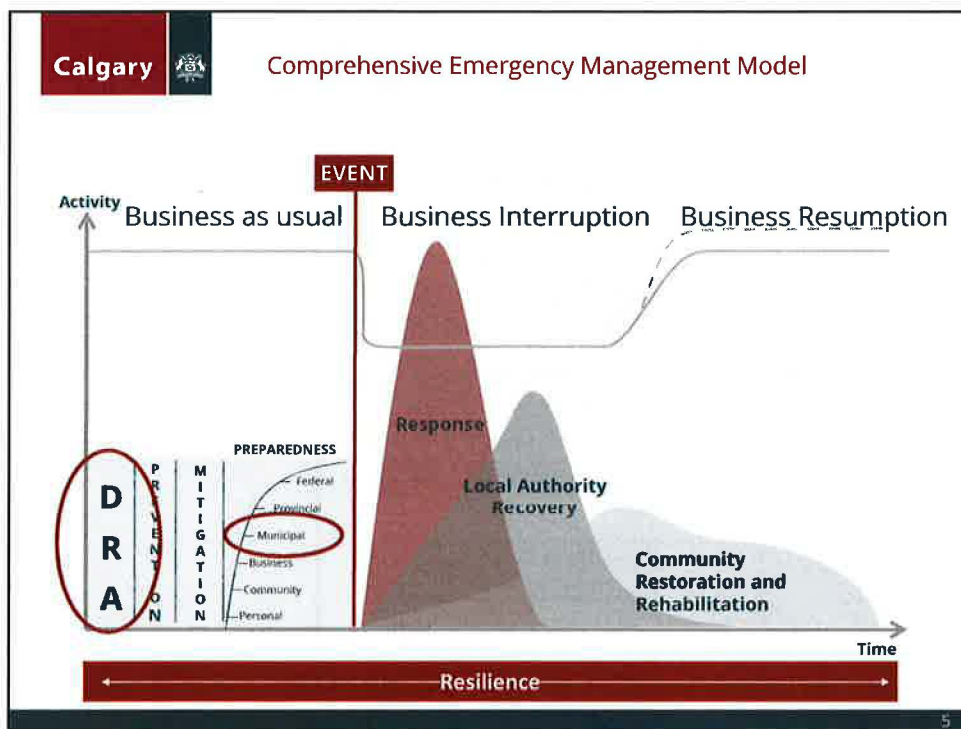
NOV 07 2018


ITEM: 7.1 EM2018-1277  
Distribution

CITY CLERK'S DEPARTMENT

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### 2018 Disaster Risk Assessment (DRA)

Aligned with broader risk management principles and standards of practice (ISO 31000, IRM)

- o Focused on disaster risk and does not replace or supersede existing risk management processes, procedures, or policies

65 hazards assessed by over 25 subject matter experts

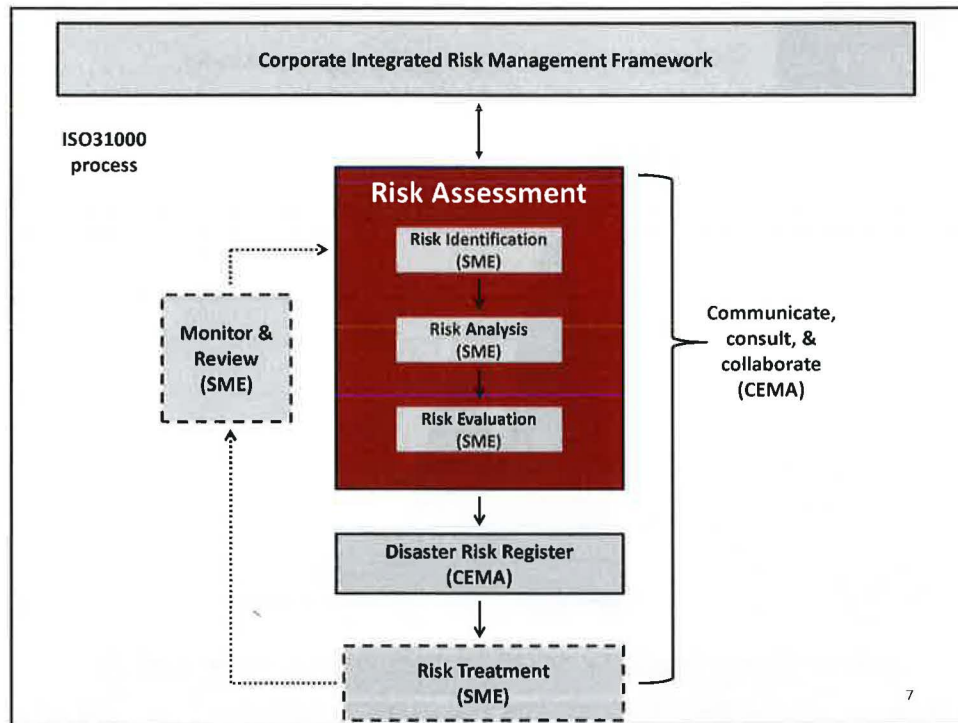
- o Internal and external SMEs, including CPS

Disaster risk is based on consequence, risk trend, and likelihood

13 disaster risks identified as 'high risk'

- o Defines Calgary's 'shocks' of special concern
- o Used for Critical Infrastructure criteria in capital planning

Foundational document for informing disaster risk management efforts  
One Calgary business cycle (2019-2022)



		Consequence				
		Insignificant	Minor	Moderate	Major	Catastrophic
Likelihood	Almost Certain	Medium	Medium	High	Extreme	Extreme
	Likely	Low	Medium	High	Extreme	Extreme
	Unlikely	Low	Low	Medium	High	Extreme
	Rare	Very Low	Low	Medium	High	High
	Very Rare	Very Low	Very Low	Low	Medium	High
	Extremely Rare	Very Low	Very Low	Low	Medium	High

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## High Risk Disasters in Calgary

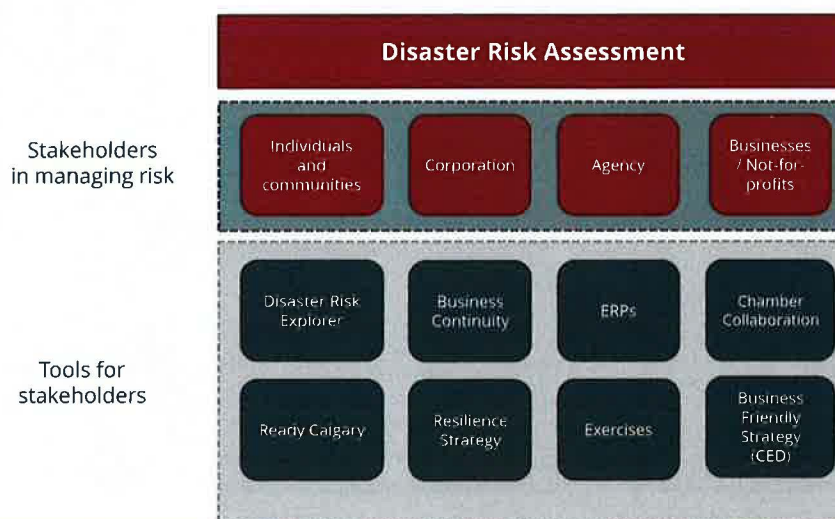
- Catastrophic riverine flooding Bow (1:100)
- Catastrophic riverine flooding Elbow River (1:100)
- Extreme cold
- Major critical infrastructure failure or disruption
- Major dam breach – Bow River
- Major hostage incident\*
- Major drought
- Major rail incident
- Severe storm - blizzard
- Severe storm - heavy rainstorm
- Severe storm - winter storm
- Tornado
- Mass casualty incident\*

\* special consideration when determining likelihood for police/security threats

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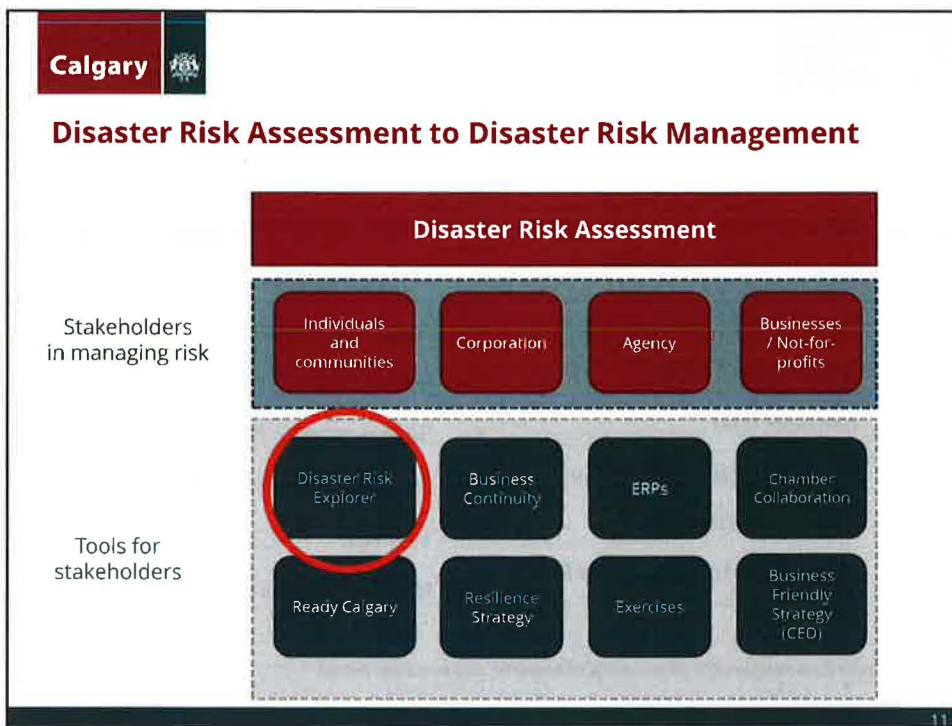


## Disaster Risk Assessment to Disaster Risk Management



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## Disaster Risk Explorer

Calgary Disaster Risk Explorer

Welcome Home Select Weather Get Ready

Calgary is at the confluence of two great rivers, Bow and Elbow Rivers and several smaller creeks. Both river networks have sophisticated and relatively short distances to Calgary. The proximity of these two river systems means that sudden changes in high flow rates can reach Calgary rapidly with little warning. Depending on the hydro-meteorological conditions, this can have a very short window for emergency response resources and time for evacuation to be deployed. This dynamic emphasizes the need to have effective early warning systems, emergency response plans, and risk mitigation strategies in place prior to any event.

**Risk Consequence Rating**

Consequence	Value
Life/Food	High
Risk Level	High
Risk Trend	Increasing
Exposure Level	1 month

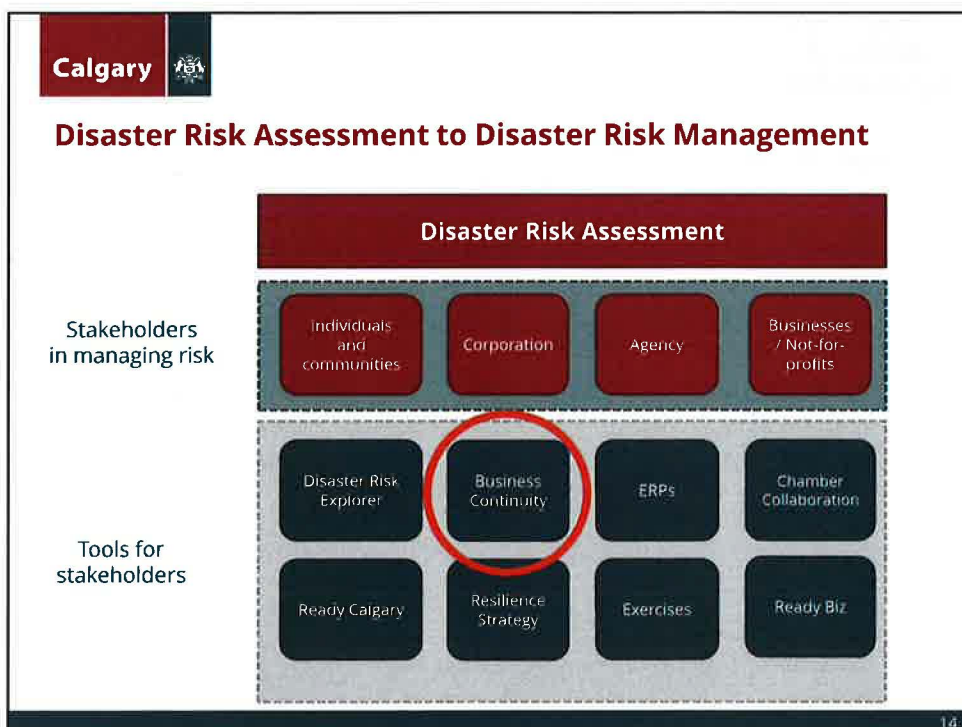
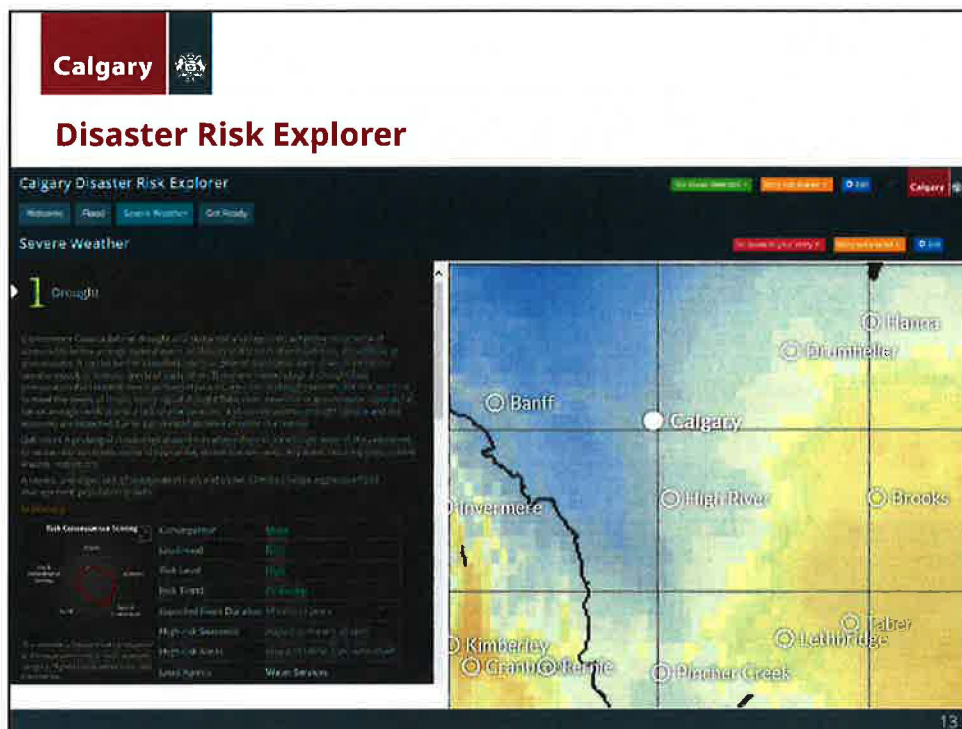
High risk of flood  
High risk of flood  
High risk of flood

Map 15 - 16-19  
Flood prone, flood large downstream

Lead Agency

Calgary is a significant development in flood-prone areas. There are over 8,000 buildings in the 100-year flood inundation area with an estimated value close to \$55 billion.

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**Purpose**

- I. Identify common vulnerabilities in the Corporation
- II. Identify common areas of resilience in the Corporation
- III. Ascertain status of business continuity processes
- IV. Acquire data to assist in real-time EOC decision-making

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**Results**

5847 business requirements analyzed

**+ 37%** increase over 2016

Reason for increase?



Increased service requirements

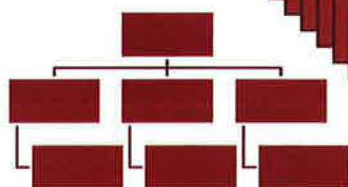
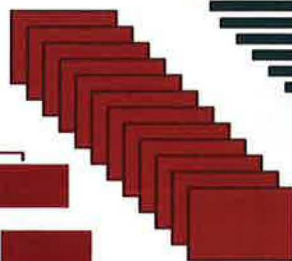
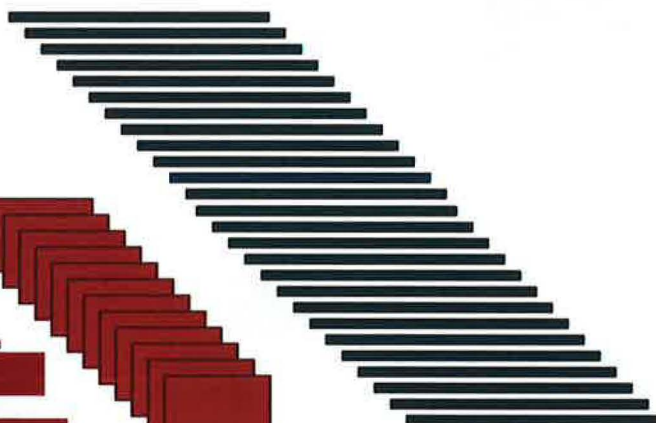


Increased understanding and rigor

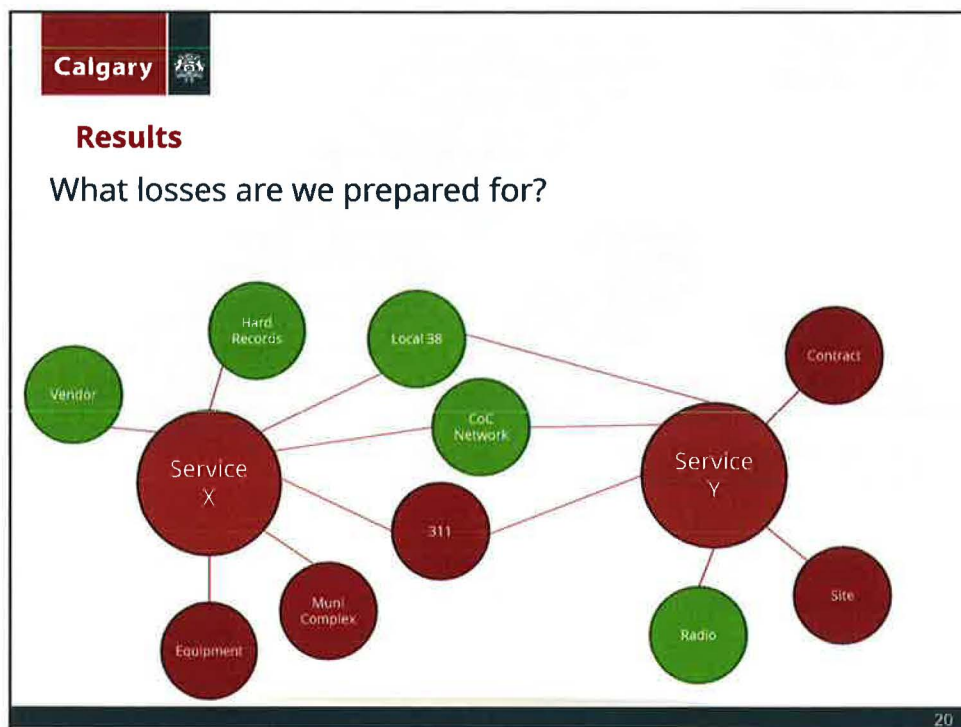
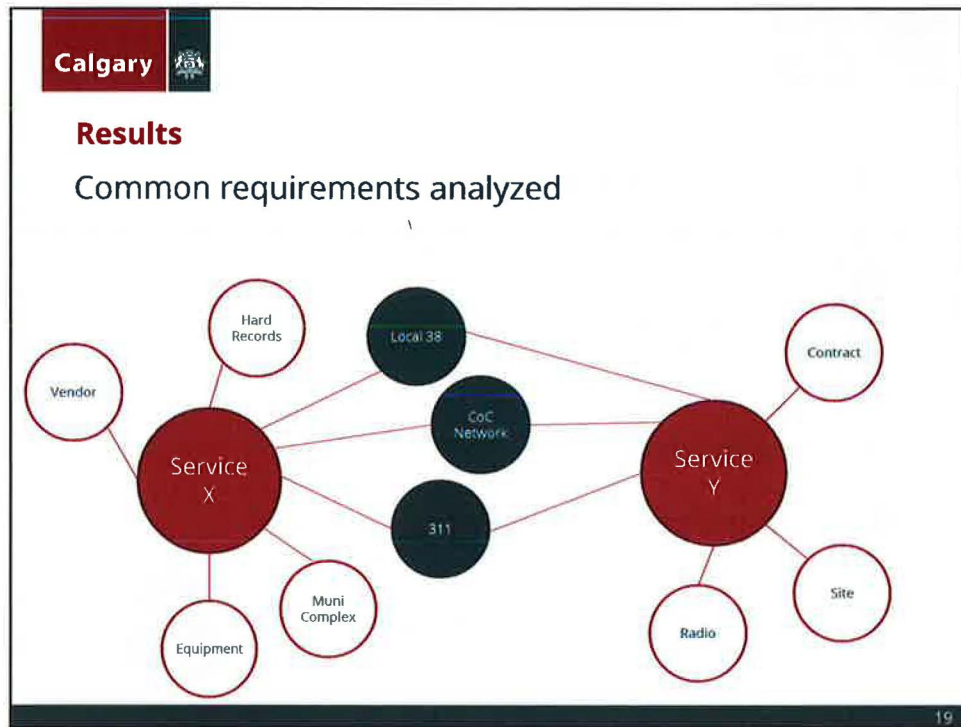


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**Results**30+ business units  
provide data239 services  
identified5847 business  
requirements  
analyzed

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**Vulnerability Index**

3 criteria evaluated:

Does this requirement have a workaround?



Does the workaround replace more than 50% of the functionality of the original requirement?



Can the workaround be activated within the necessary time?

**RESILIENT**

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**Vulnerability Index**

3 criteria evaluated:

Does this requirement have a workaround?



Does the workaround replace more than 50% of the functionality of the original requirement?



Can the workaround be activated within the necessary time?

**VULNERABLE**

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### Vulnerability Index

Service Level	# of requirements	Resilient	Vulnerable	% vulnerable	% diff from 2016
Essential	3181	1848	1333	42%	-2%
Necessary	1457	854	603	41%	-16%
Valued	1209	578	631	52%	-10%
Total	5847	3280	2567	44%	-7%

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### Results

- Understanding Calgary's disaster risk;
- Understanding how City services are resilient and vulnerable to these risks;
- Plan to share information with stakeholders involved in managing disaster risk.

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