



EXPLORING CYBER RESILIENCY

MPA Student Research Project

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AGENDA

- 01** INTRODUCTION TO CYBERSECURITY & RANSOMWARE
- 02** THE PROBLEM
- 03** METHODOLOGY & LIMITS
- 04** CASE STUDIES
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- 07** QUESTIONS

UNDERSTANDING CYBER SECURITY



The core function of cyber security is to protect devices and technology we use and the services we access online from theft, damage and unauthorized access to personal information

There has been an increasing amount of research into cyber vulnerabilities and potential risks, but little has been studied in the Canadian municipal context to encourage investment in cyber resiliency



UNDERSTANDING THE HACKER

LOW BARRIER
TO HIGH
REWARD

1. DATA BREACHING

2. RANSOMWARE

COMMON ATTACK VECTORS:

1. MISCONFIGURATION
2. EMAIL LINKS
3. KNOWN VULNERABILITIES

AVERAGE RANSOM PAID

140K

(ONLY 16% OF TOTAL RECOVERY)

THE REALITY OF RANSOMWARE ATTACKS

FAILURE TO REPORT

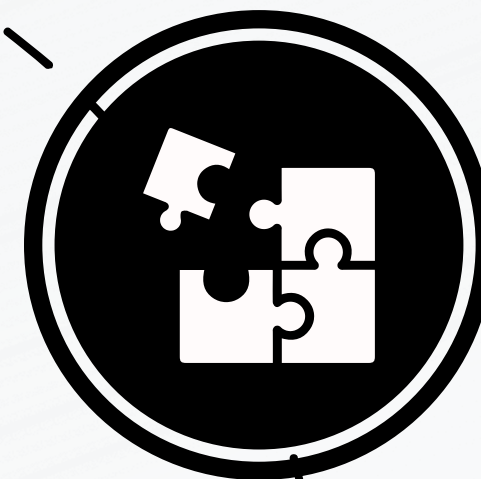
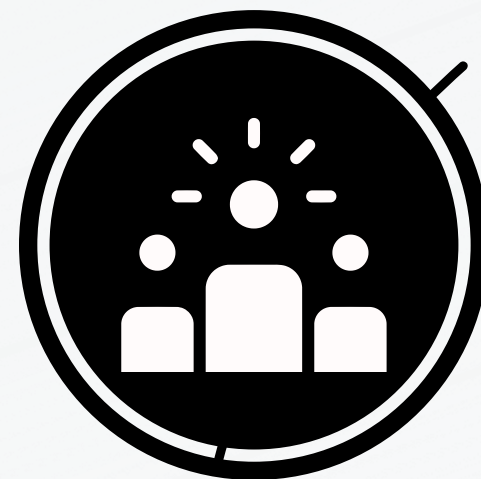
Concerns about bad publicity and loss of reputation, or to avoid scrutiny into how it handled a ransomware attack
Not fully understanding the extent of the breach and the impact

NEVER TOO SMALL

Smaller organizations are far from immune.
The average number of ransomware incidents for small organizations is perilously close to the national average

CONTINUOUSLY EVOLVING

Ransomware malware is becoming more advanced, distribution is becoming more targeted, and tactics are continuously evolving to extort the greatest ransom from victims





TO PAY OR NOT TO PAY

To explore the decision made by municipalities
during a ransomware attack and extract lessons
from it

METHODOLOGY



Municipality	Date	Timeline	Data Breach	CI disrupted	Services Impacted	Viable Back up or Cloud	Ransom	Insurance	Estimated Cost to rebuild	Did they have a plan?
Town of Wasaga Beach (24,862)	April 30 th 2018	7 weeks	no	no	Computer network	Partial back up	\$35,000	no	\$250,000	no
Town of Midland (17,817)	September 1 st , 2018	48 hours	no	no	Computer Network and email service	no	\$76,000	2 million coverage	\$250,000	yes
City of Woodstock (46,705)	September 20 th 2019	6 weeks	no	yes	Computer network and police computer network	Yes	no	no	\$1,217,000	no
City of Stratford (33,323)	April 14 th 2019	5 days	yes	no	Computer network, phone, and email	No	\$75,000	\$15,000 deductible	N/A	no
City of Toronto (Toronto Transit Commission) (2,794,356)	October 28 th 2021	1 week	yes	yes	TTC app and computer display	Yes	no	N/A	\$750,000	yes
City of Clarence-Rockland (26,505)	October 25 th 2021	8 weeks	no	yes	Computer network, email, and payments	Yes	no	No	N/A	no
Town of St. Mary's (7,386)	July 20 th 2022	4 weeks	yes	no	Email, bookings, and payments	no	\$290,000	N/A	\$1,300,000	no
Elgin County (94,752)	April 1 st 2022	4 weeks	yes	yes	Computer network, website, and emails	no	no	N/A	N/A	no
London Public Library (422,324)	December 13 th 2023	4 weeks	yes	yes	Computer systems, website, and phone	no	no	N/A	N/A	yes
Toronto Public Library (2,794,356)	October 28 th 2023	4 months	yes	yes	Computer systems, website, phone	partial backup	no	N/A	\$1,174,000	yes
Toronto Zoo (2,794,356)	January 5 th 2024	1 week	yes	no		yes	no	N/A	N/A	yes
City of Hamilton (771,000)	February 25 th 2024	5+ months 45% as of June 2024	no	yes	Phone, library app, permit application, website	Partial	no	N/A	\$5,700,000	yes

CONCLUSION: DON'T PAY!

Barriers



- Lack of funding
- Insufficient number of staff
- Inadequate training
- Lack of end user accountability
- Inadequate cyber awareness
- Needed enforcement of cyber politics and support from council
- Too many IT systems
- Lack of support from department managers

RECOMMENDATIONS



Ensuring a communication
plan is in place & legal, audit
and insurance
considerations

COMMUNICATION



Routine Risk Assessments
Business Back-Up Planning
Incident Reporting
Procurement of
Cryptocurrency

PLANNING & POLICY



Mandatory Training
Protocols
Up-To-Date Systems
Multi-Factor Authentication

TRAINING

THANK'S FOR LISTENING

*I will now take any questions about
myself, the MPA program, or the
work presented today.*

