

# Smart Cities In the Modern Era

Investigating Security, Urban Planning, and Social Equity in the Digital Age

**CYSE201S: Cybersecurity and the Social Sciences**

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# The "Brain" of the Modern City

Why we're turning our cities into massive computers.

# WHAT MAKES A CITY "SMART"?

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## *The Technology*

A massive network of IoT sensors, 5G towers, and AI software that handles everything from traffic flow to trash pickup.

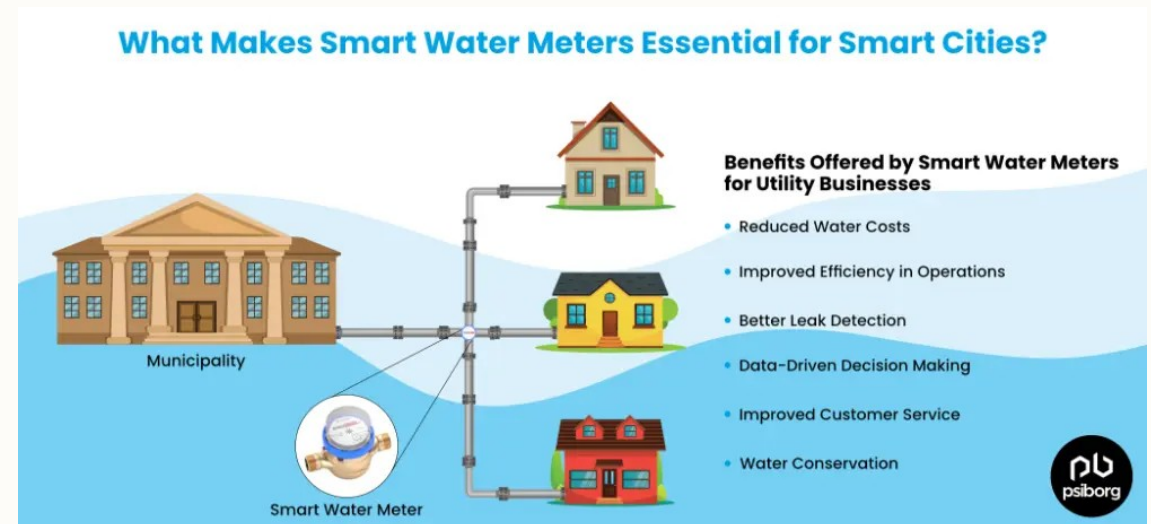
## *A Promise*

Urban planners love it because it's efficient. Smart grids save energy, and real-time data helps reduce traffic congestion by up to 15% in major metros.

# VULNERABILITY #1: THE IOT EXPLOSION

The problem is the scale. In a typical smart city, there are millions of devices. Smart meters, sensors, cameras, etc., and many are made by third-party vendors who prioritize cost over security. Commonalities include:

- Default passwords that are never changed
- Devices that can't run modern updates
- Unmanaged endpoints in public spaces



# COMPARING CYBER RISKS

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Threat Type	Target System	Real-World Consequence
<b>Ransomware</b>	Municipal IT / Data Centers	City services (DMV, Billing) shut down for weeks.
<b>OT Hijacking</b>	Operational Tech (Water, Power)	Physical damage or public safety hazards.
<b>DDoS</b>	Public Information Portals	Citizens lose access to emergency alerts or maps.
<b>Data Theft</b>	Surveillance / PII Databases	Massive privacy breaches and identity theft.

# CASE STUDY: CRITICAL INFRASTRUCTURE

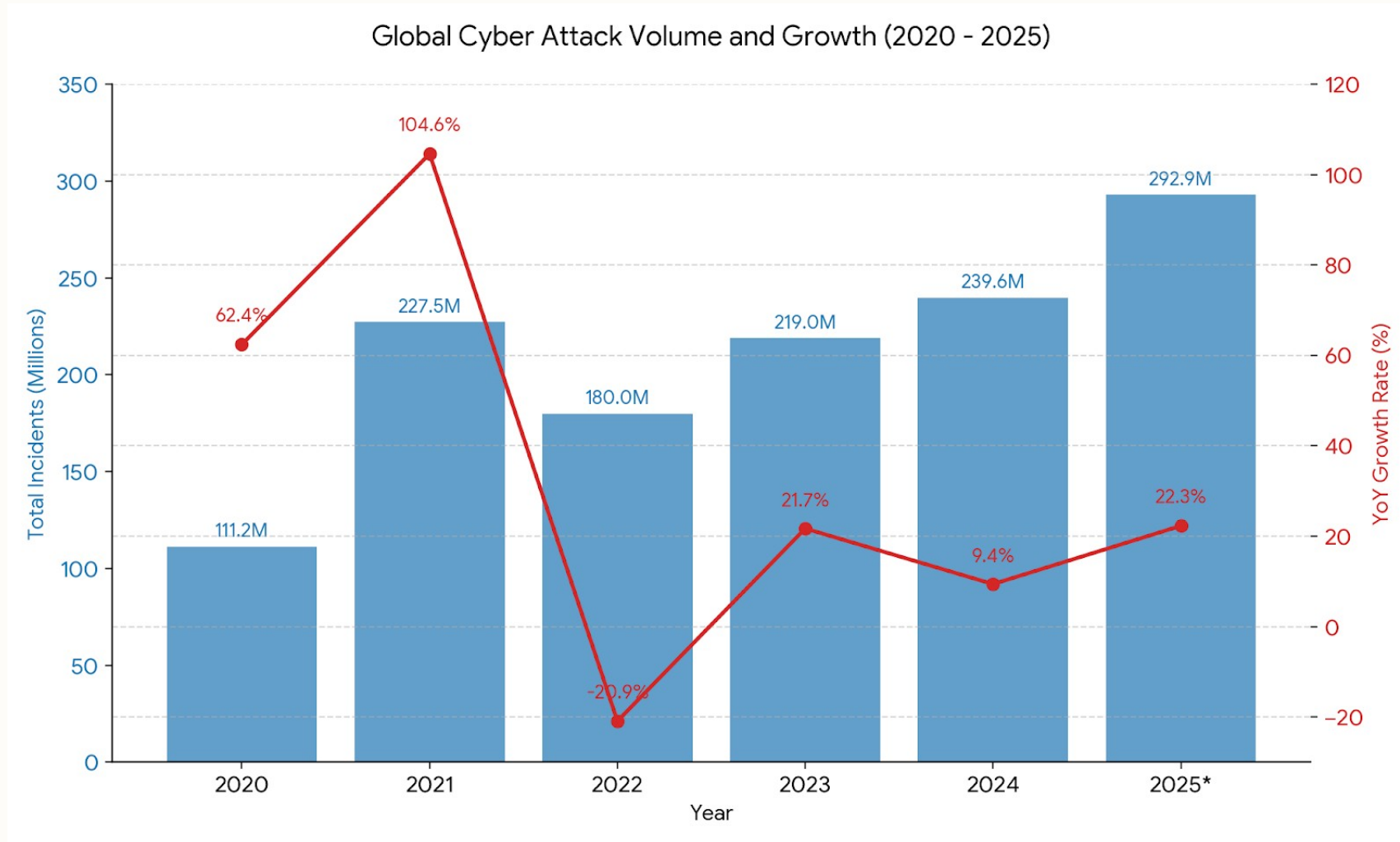
## *When Water Systems Get Hacked*

In early 2021, a hacker gained remote access to the water treatment system in Oldsmar, Florida. They tried to increase the levels of sodium hydroxide to dangerous levels.

Attacks on this scale are usually financially motivated, but this was an attempt to physically harm people by exploiting a weak remote access password.



# THE SURGE IN ATTACKS (2020-2025)



# Urban Planning & The Budget Trap

Why we can't just "patch" a city.

# WHY SECURITY IS AN AFTERTHOUGHT

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**Independent Funding:** Only 16% of cities can independently fund smart technology. This leads to a reliance on private vendors who own the proprietary security code.

**Fragmentation:** Traffic signals are run by one department, water by another. Security protocols are rarely standardized across the whole city.

**Legacy Systems:** Most city hardware is built to last 20+ years, but cyber threats can change by the day.

# THE SOCIAL COST

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## *Privacy vs. Progress*

The "Sidewalk Labs" project in Toronto failed largely because citizens didn't trust how their movement data would be used. When everything is a sensor, the city becomes a surveillance machine.

Research shows that marginalized communities are disproportionately targeted by automated surveillance bias.

# HOW WE FIX IT

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**Zero Trust:** Verify connections and never trust reconnects. Every device on the grid must be authenticated every time it connects.

**Policy First:** Legislating security standards for IoT vendors before they win city contracts.

**Public Literacy:** Educating citizens on data rights and transparency portals to build trust.

# DISCUSSION & SOURCES

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Is the efficiency that smart cities bring worth the risk?

**Sources:**

- Mouser Electronics: Cyber Challenges 2024
- SonicWall Threat Report 2025
- Mcity White Paper: Privacy Frameworks 2023
- The Guardian (2026): Mountain View Audit Reports
- EFF (2025): Surveillance Abuses in Review



# IMAGE SOURCES

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<https://psiborg.in/wp-content/uploads/2024/07/Water-meter1.webp>

[https://www.adasasystems.com/files/adasa/images/solutions/bulk-water/distribution-network-management/water-infrastructure-automation/water-infrastructure-automation\\_body.jpg](https://www.adasasystems.com/files/adasa/images/solutions/bulk-water/distribution-network-management/water-infrastructure-automation/water-infrastructure-automation_body.jpg)

<https://d2csakudaechgf.cloudfront.net/images/uploads/img-41-3684.webp>

<https://media.istockphoto.com/id/2162042571/photo/diverse-undergraduates-debating-in-a-lecture-room.jpg?s=612x612&w=0&k=20&c=xOBT127SHcdMbIH7nMHPaWizmwBxd1ThTFUQChJGD9k=>