

# **Revolutionizing Retail and Hospitality:** *Construction's Role in the Tech-Driven Future*

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## US Spend on WWII (in today's dollars)

- 151 Aircraft Carriers
- 350 Destroyers and Major Combat Ships
- 297,000 planes
- Salaries for 16.5m men and women

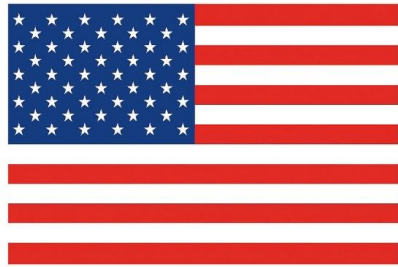
**Total spend ~ \$4.2 trillion**

**US Pandemic Spend > \$5 trillion**

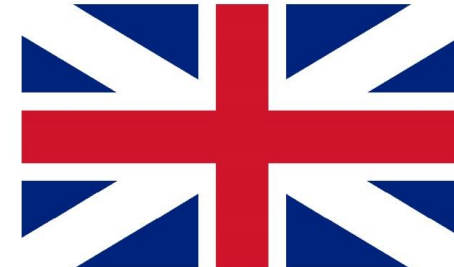
**About \$2.1t went to Retail**

## 2021 & 2022 Sales Growth - A Reference Point

Source: Government Reports, IHL Group



US Retail Sales Growth

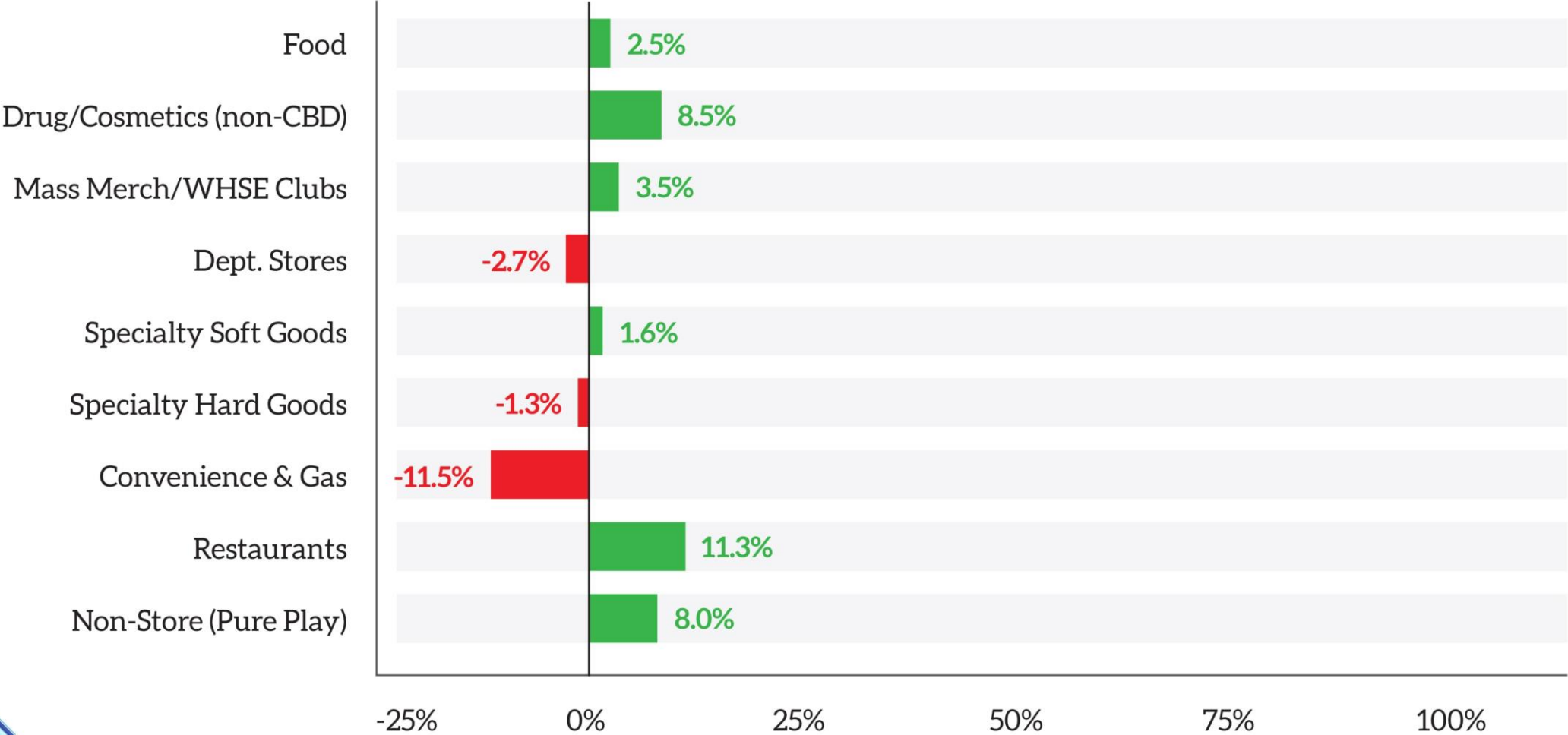


Total Retail Sales of India (2021) + UK (2022)

# Retail Store Sales by Segment

PERCENT CHANGE (YTD - DEC 2023) - TOTAL RETAIL SALES **INCREASED 3.1% FOR YEAR**

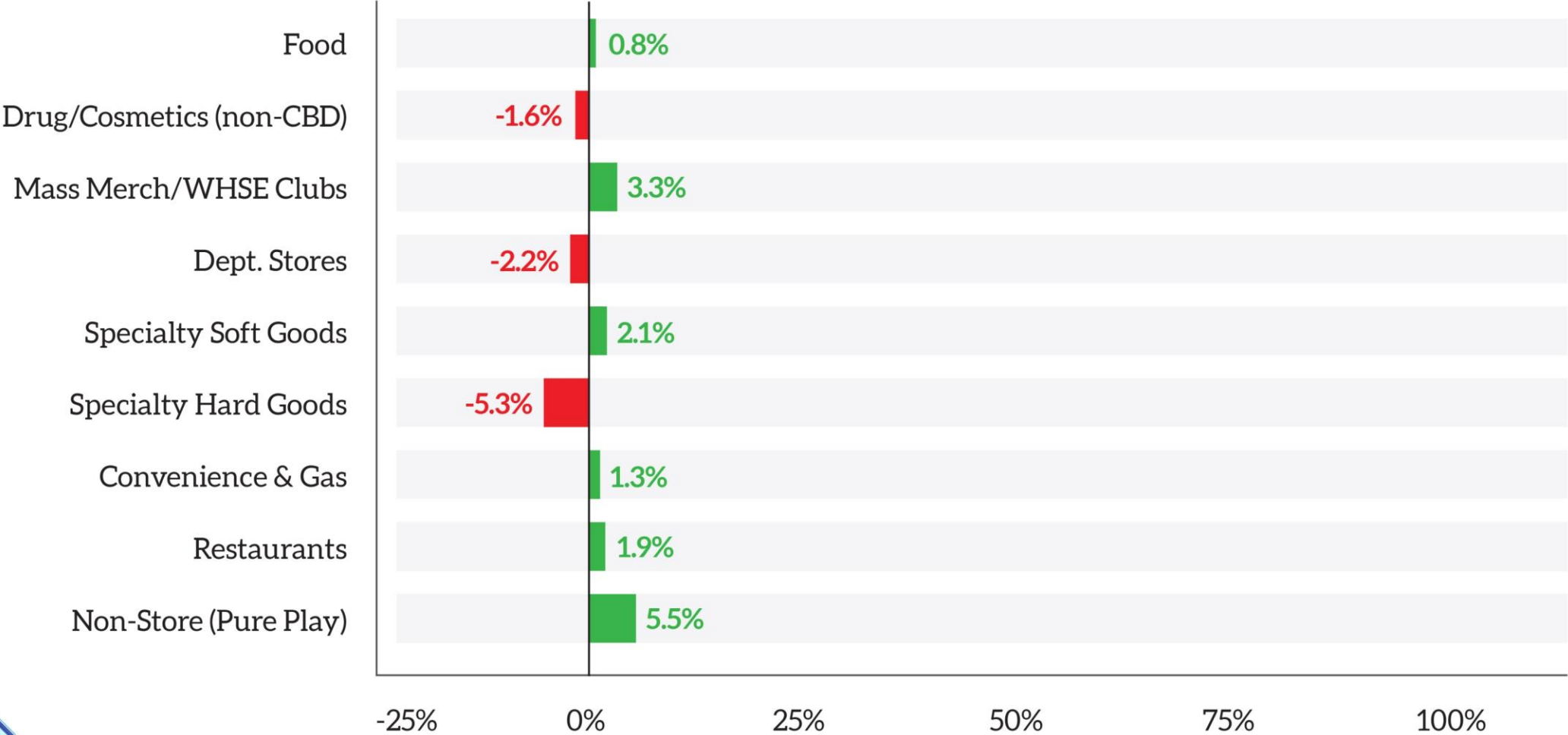
Source: U.S. Census - Retail Monthly Trade / IHL Group



# Retail Store Sales by Segment

PERCENT CHANGE (YTD - JUNE 2024) - **INFLATION ADJUSTED** TOTAL RETAIL SALES **UP 1.2% FOR YEAR**

Source: U.S. Census - Retail Monthly Trade / IHL Group

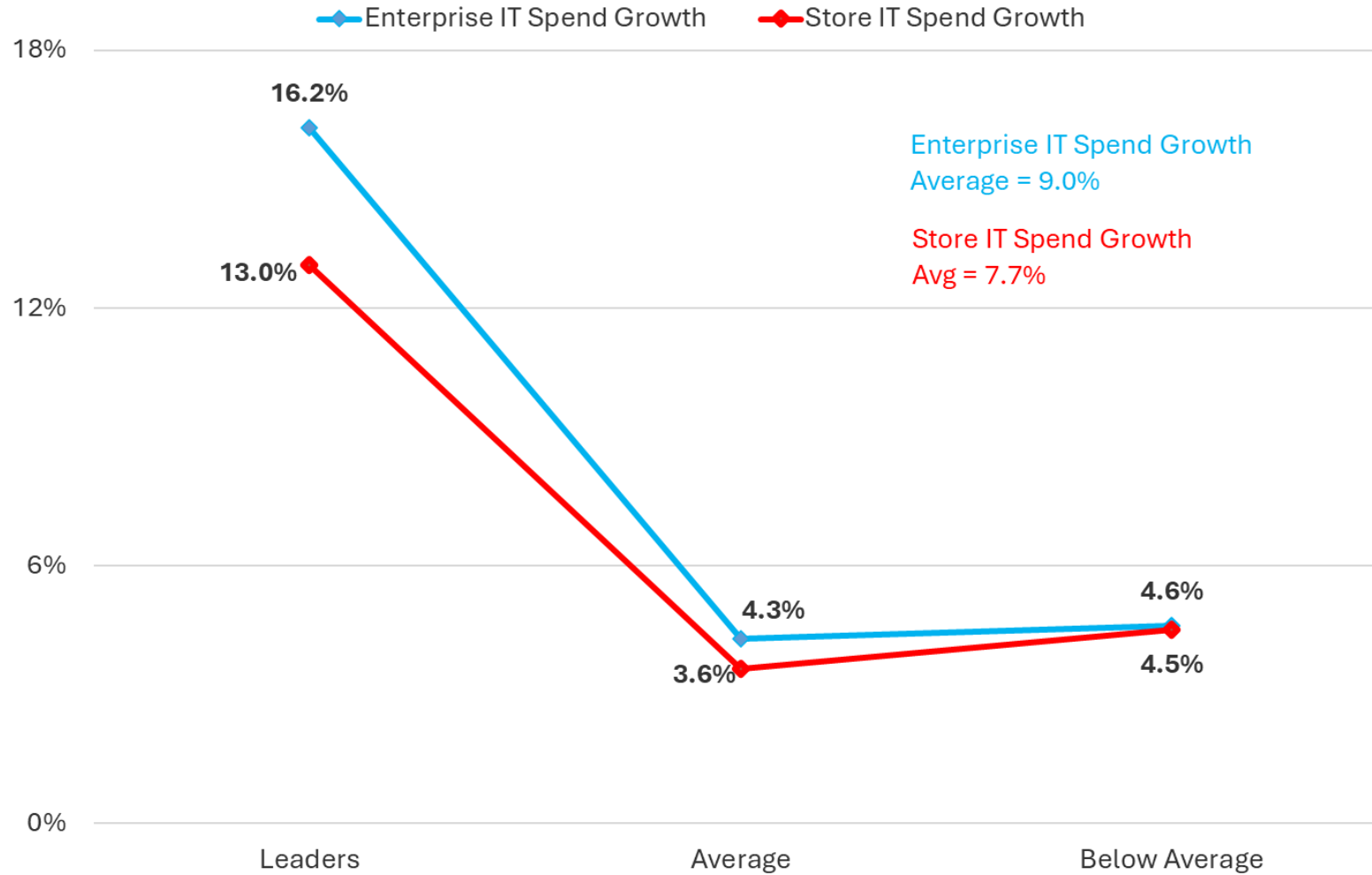


# **Bottom Line**

**Retailers must do more with less**

## Leaders Lead in IT Spend Growth

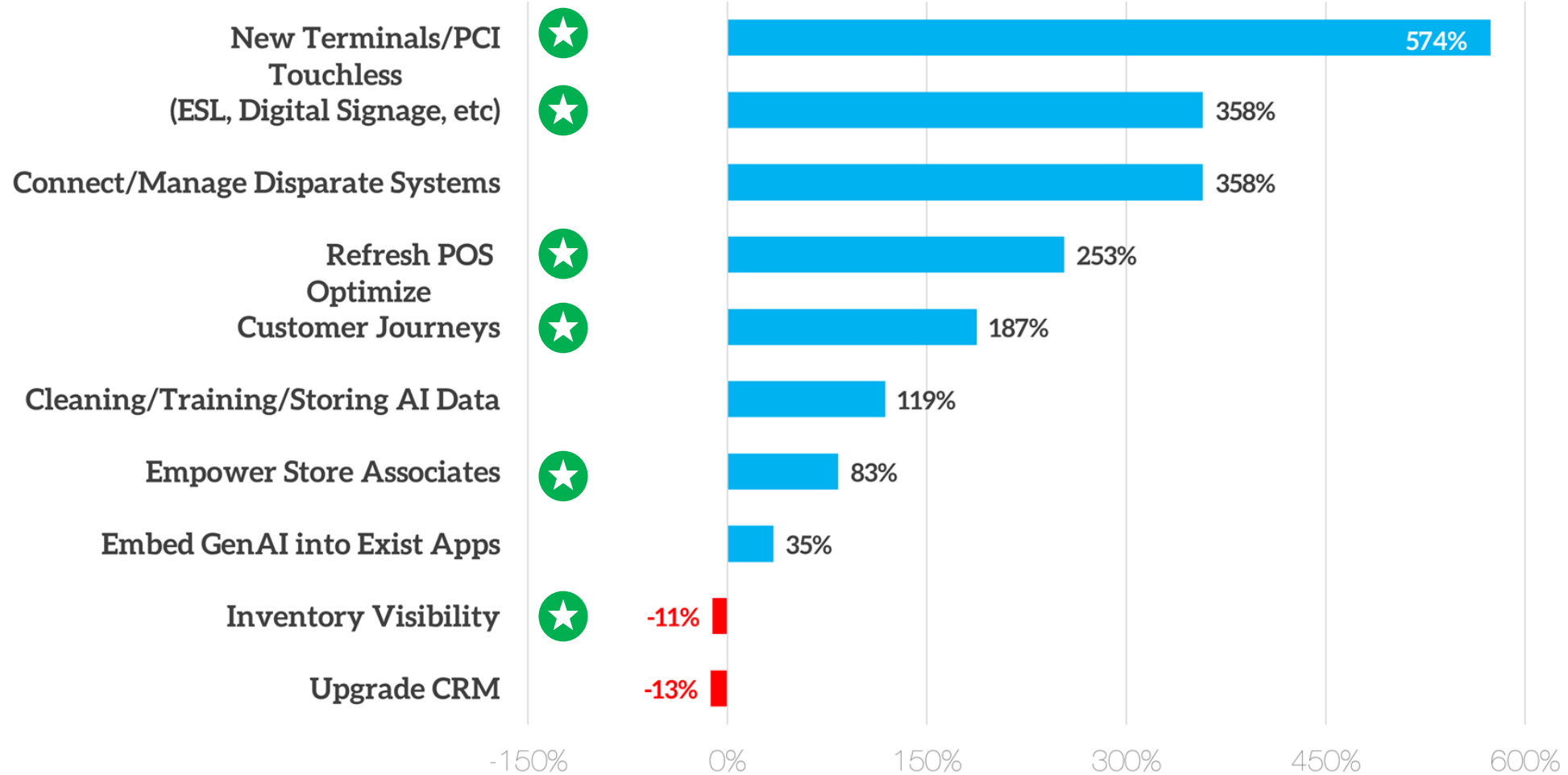
Source: IHL Group



## 2024 Tech Priorities

Leaders as % Greater / Less than Below Average

Source: IHL Group

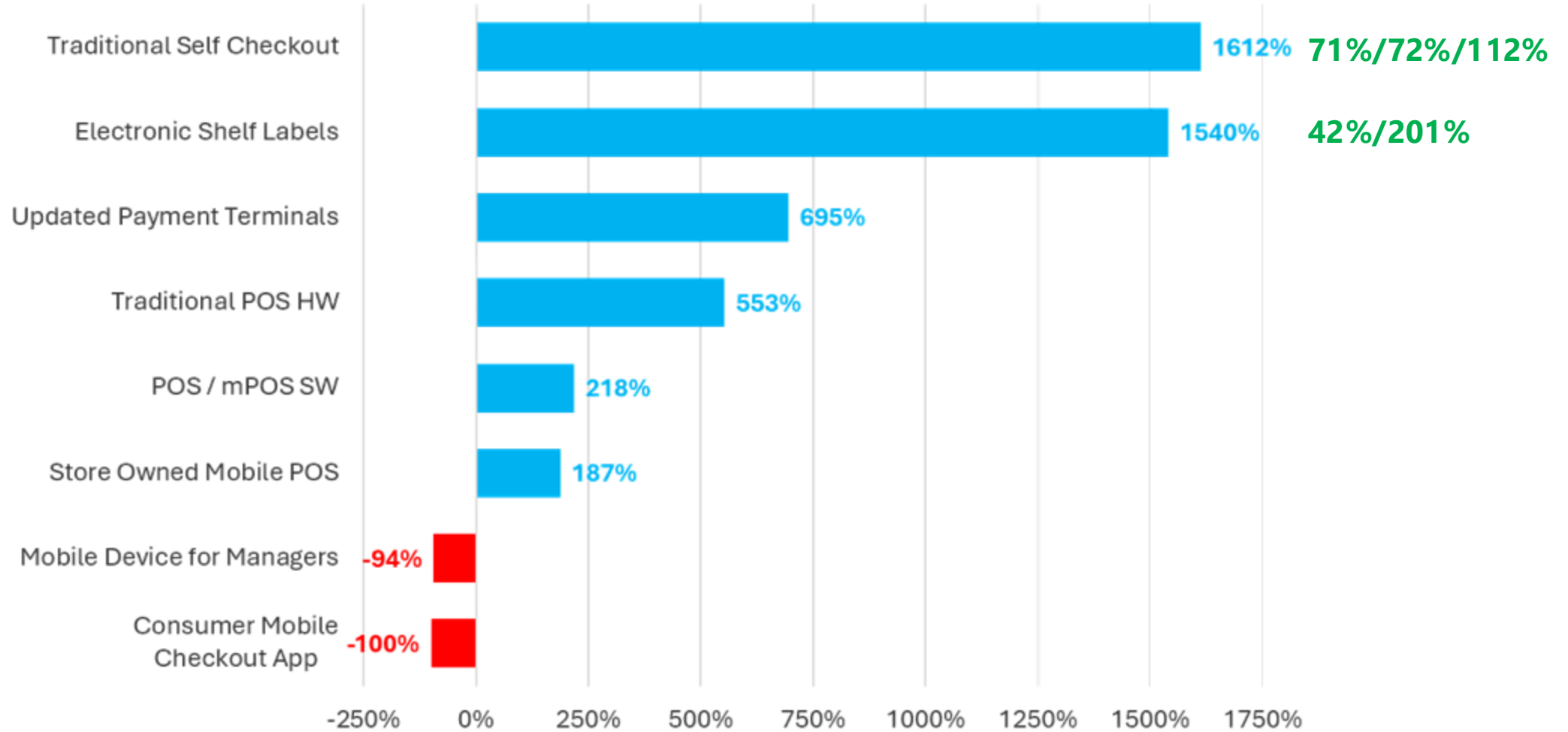




## Store Technologies - Current Use

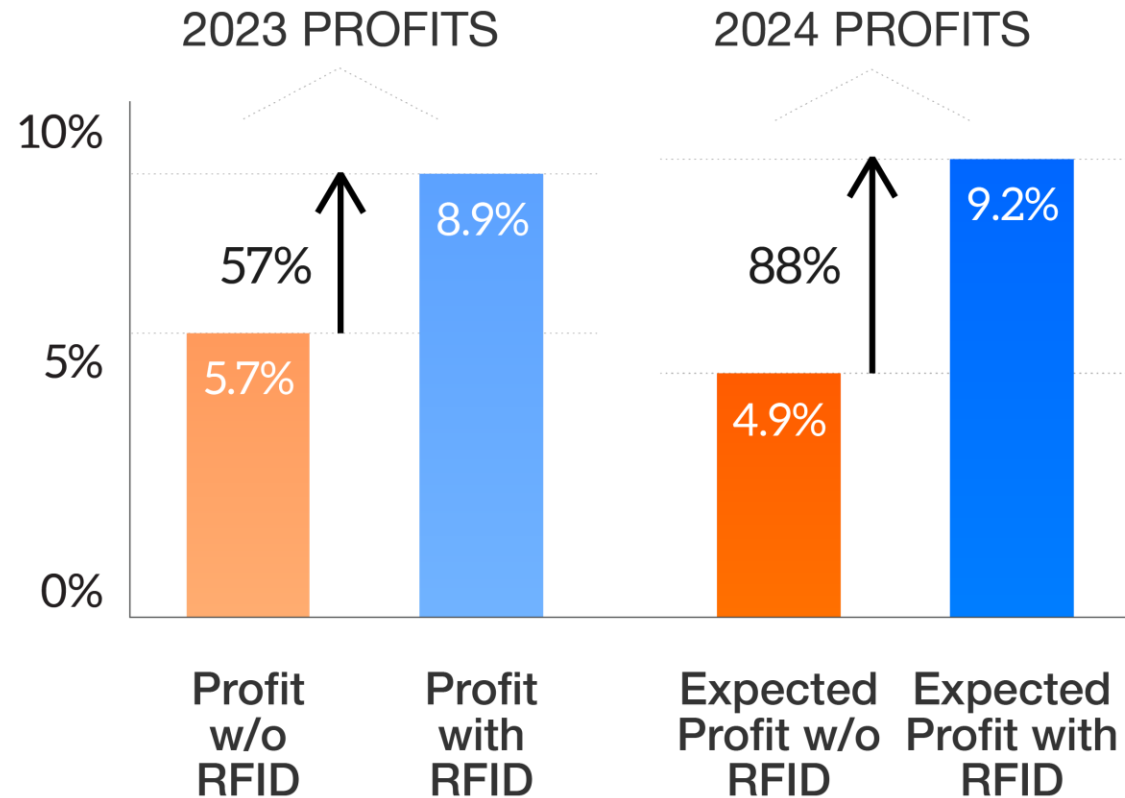
Leaders as % Greater / Less Than Below Average

Source: IHL Group



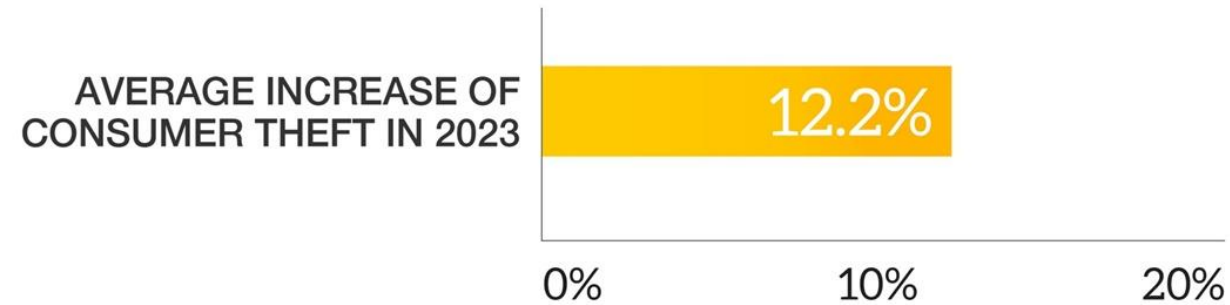
# Higher Profit Expectations with RFID

Source: IHL Group



## Rise in Consumer Theft

Source: IHL Group



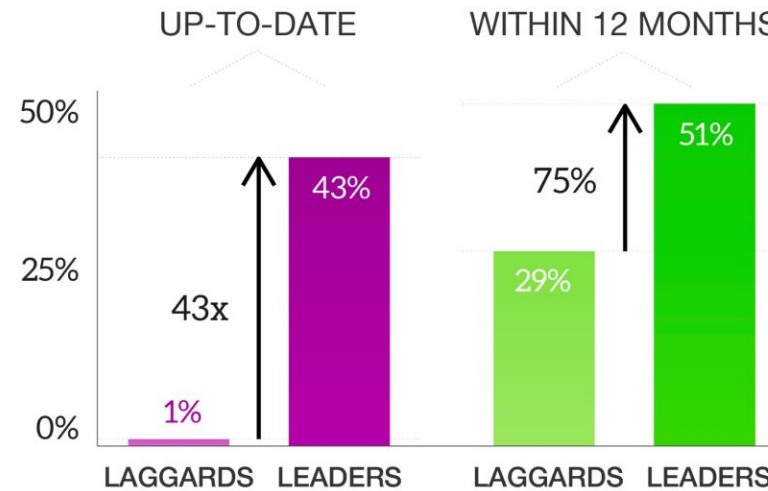
Those using facial recognition saw  
**74%** lower consumer theft  
growth in 2023.

# Seeing Higher Profit Growth with Computer Vision

Source: IHL Group

## 2023 PROFIT WINNERS

**43x** more likely to **use Computer Vision** and  
**75%** more likely to be **planning to invest within next 12 months** than below average performers



# RETAIL'S AI REVOLUTION

The letters 'AI' are rendered in a large, bold font. The 'A' and 'I' are filled with a dark blue color and overlaid with a glowing blue circuit board pattern. Small white dots are scattered along the circuit lines, giving it a digital, high-tech appearance.The logo for IHL Group, featuring the letters 'IHL' in a bold, sans-serif font, followed by the word 'GROUP' in a smaller font below it. To the right of the text is a stylized blue arrow pointing to the right, with a white highlight on its tip.

## Some Quick Level Set – Key Terms

- **AI/ML** – heavy training, specific algorithms – output specific to algorithm
- **Generative AI** – Trained on data sets, generates new content
- **Artificial General Intelligence (AGI)** – acts human - future
- **LLM** – Large Language Models (ChatGPT, Bard)
- **Multimodal** – Does Language/Graphics or combinations
- **LAM** – Large Action Models
- **Imitation** – AI watches and imitates/recreates (writes it's own code)
- **NPU – Neural Processing Unit** – Required for Onsite processing, designed for GenAI

# Power of AI on Retail Performance

Source: IHL Group/RIS News Retail Transformation Study Initial Results

**How much higher growth for those using AI/ML Today**

**Sales Growth 2023 2.3x**

**Profit Growth 2023 2.5x**

**2024 Sales Growth 2.4x**

**2024 Profit Growth 2.9x**

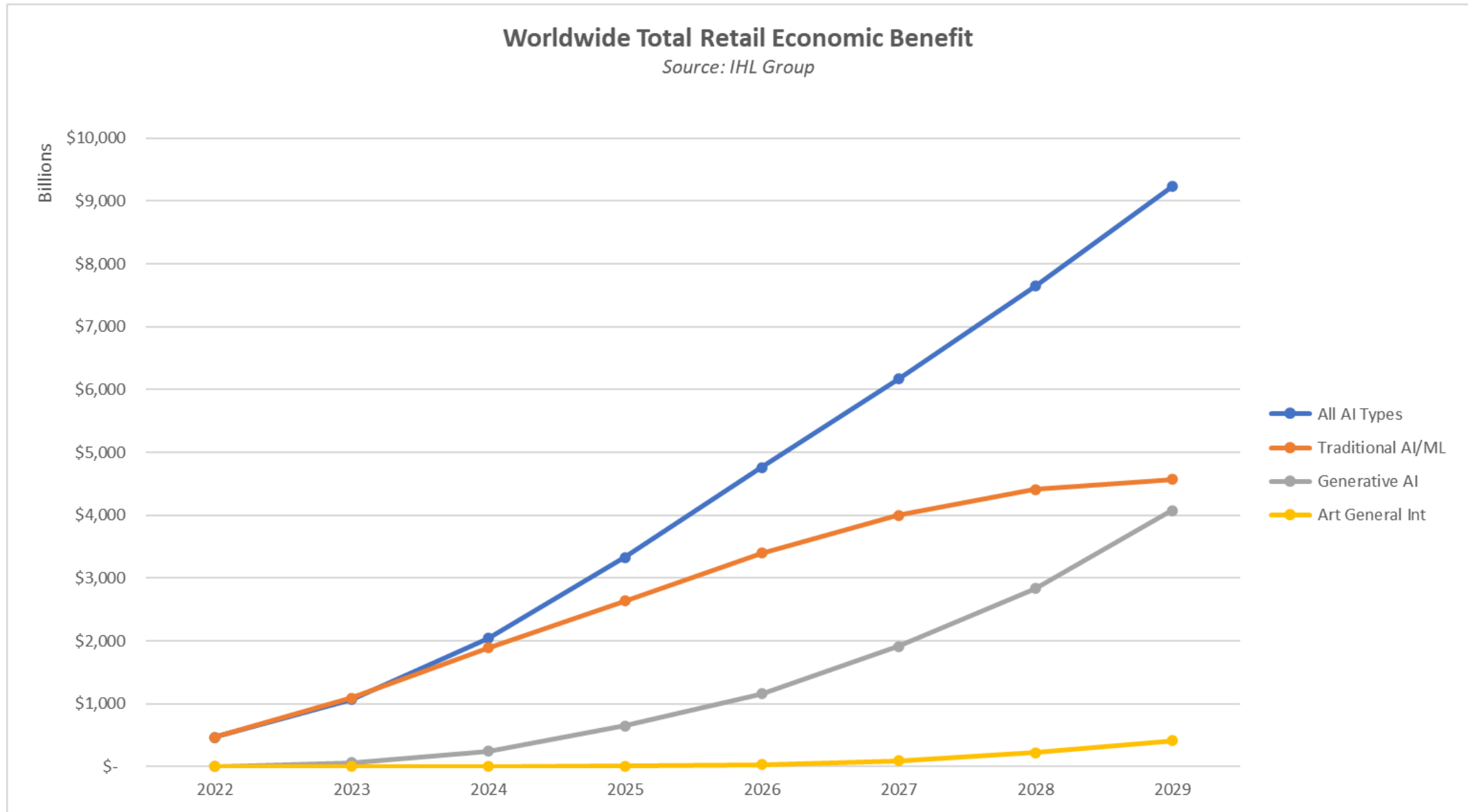
**Average performance over 11 different solution areas:** Forecasting, Order Management, Order Fulfillment, Supply Chain/WHS Management, Merchandise Allocation, Pricing/Promotions, BI/Analytics, Loss Prevention, Sales & Mktg, HR/WFM/App Dev/Customer Service, Other

## Worldwide Retail AI Economic Impact Through 2029

Source: IHL Group

**\$9.2**  
**Trillion USD**





# Key Construction/Design Impacts

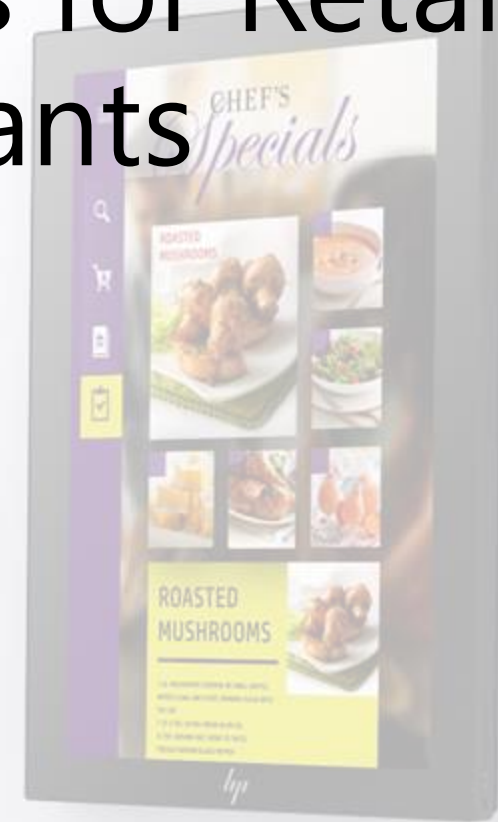
- **Site Selection and Market Analysis**
- **Generative Design**
- **Project Management**
- **Energy Management**
- **Quality Control**
- **Security and Surveillance**
- **Robotics/Intelligent Kitchens/Fulfillment**
- **Predictive Maintenance**

# Financial Impact Opportunity – North America

*Retailer/Restaurant - AI Technology Impact Only thru 2029*

- **Real Estate – \$14.6b**
  - **Site Selection/Analysis/Contracts/Management**
  - **Generative Design**
  
- **Infrastructure / Stores ~ \$550b**
  - **Energy Management Design/Operations**
  - **Security and Surveillance – Loss Prevention/Mitigation**
  - **Robotics/Intelligent Kitchens/Fulfillment**
  - **Predictive Maintenance**
  - **Network Design (Fixed, Wireless, WAN/LAN, Antivirus)**
  - **Sensors/IoT – Lighting/Refrigeration/Electronics**

# Top 7 Design Implications for Retail Stores and Restaurants



# Power Needs

## Assessing Power Needs

It is important to assess the power needs of your store before implementing new retail technologies. This includes evaluating the current electrical system, identifying areas of improvement, and estimating future power requirements.

## Backup Power

Retail stores should have a backup power system in place to ensure continuity in case of power outages. This includes backup generators, uninterruptible power supplies (UPS), and surge protectors.



TECH

# Generative AI requires massive amounts of power and water, and the aging U.S. grid can't handle the load

PUBLISHED SUN, JUL 28 2024 9:00 AM EDT

Data Centers Now Need a Reactor's Worth of Power, Dominion Says

(Bloomberg) -- Data center developers in Northern Virginia are asking utility Dominion Energy Inc. for as much power as several nuclear reactors can generate, in



## Google and Microsoft now consume more electricity than 100+ countries

In 2023, the two tech companies both consumed 24 TWh of electricity, more than the entire country of Iceland consumed.

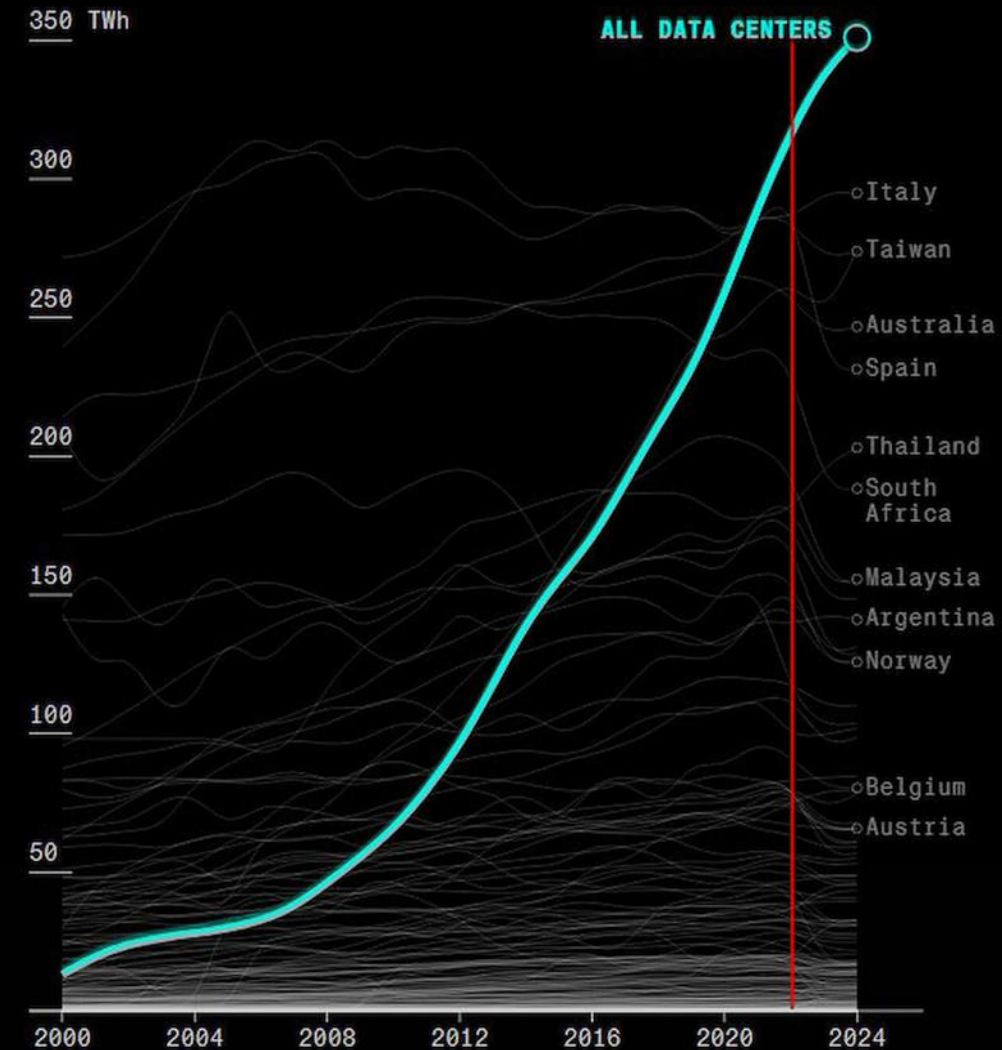
Electricity consumption (TWh)



Chart: Michael Thomas • Source: EIA Monthly Energy Review / Company reports • Created with Datawrapper

## Altogether, data centers use more electricity than most countries

Only 16 nations, including the US and China, consume more



Sources: Bloomberg analysis of BloombergNEF and DC Byte data

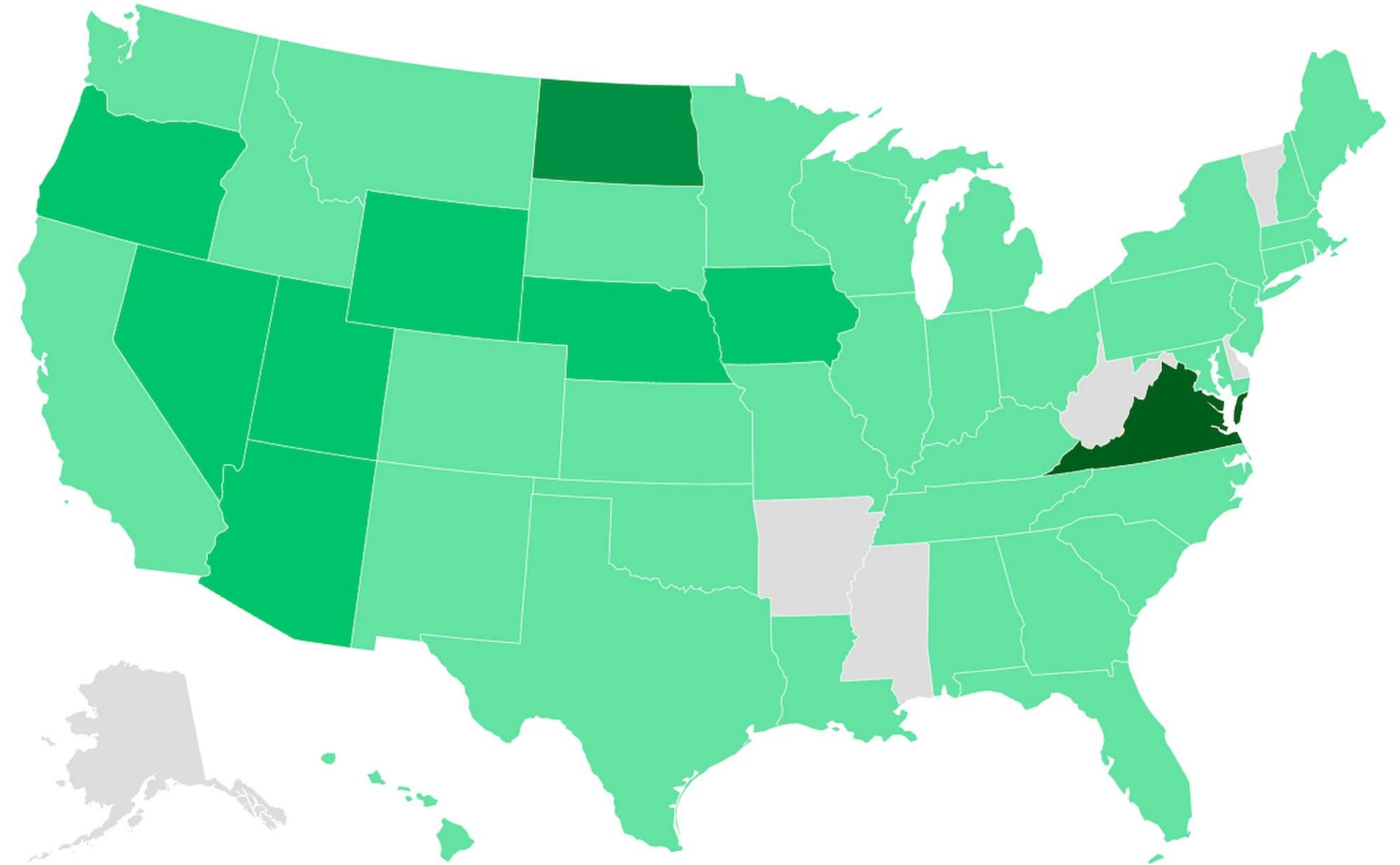
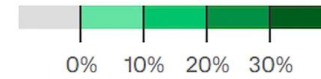
Note: Data center energy consumption through Q1 2024. National energy consumption levels are actual through 2022 and projected for 2023 and 2024.







### Projected data center share of 2030 electricity use



## xAI – Latest Data Center

- 100 Megawatts
- Enough to Power 17,300 homes
- 1/5<sup>th</sup> of all data centers worth of power in Paris

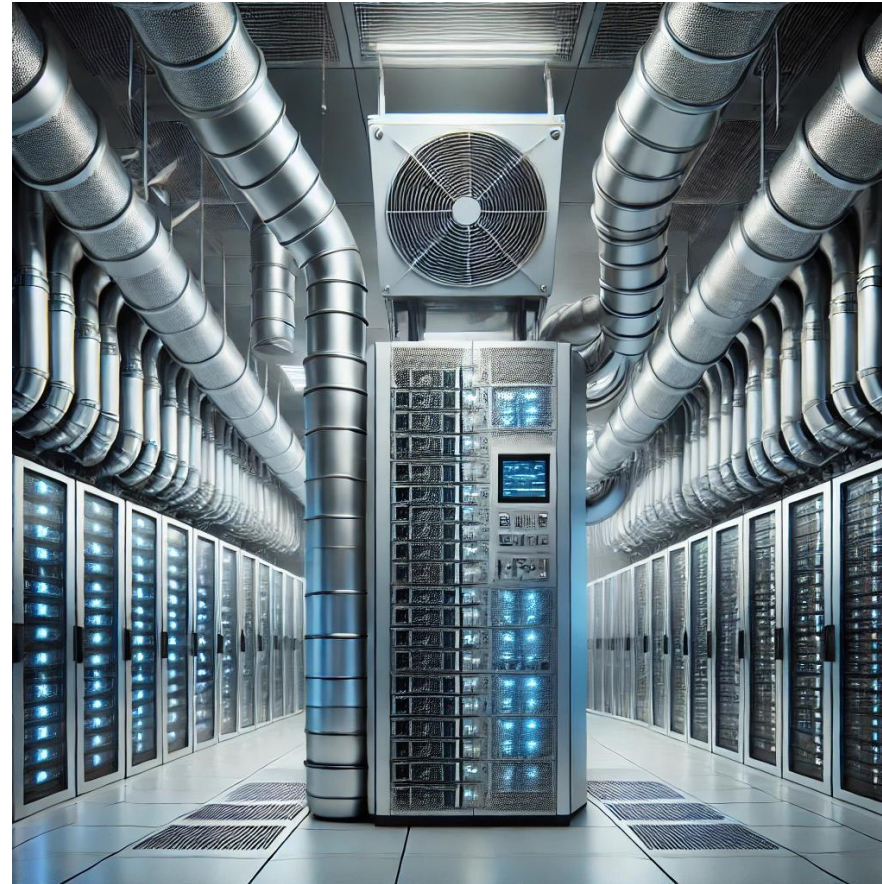
Adapted from EPRI; Map: Axios Visuals

# What is the power plan?



H-E-B and Walmart in Texas installing microgrids for power outages

# Heat and Airflow





# Water Hungry

## ➤ At datacenter alone

- 225 ChatGPT queries require 1 gallon of water to cool
  - August 2023 – Over 60million queries a day
- By 2027, annual data center water consumption is 1/2 UK

## ➤ At the local level

- Desire is to move the processing local
- Edge Servers, IoT equipment
- Must plan for cooling, heat removal not just of production equipment
  - Removing heat, maintaining security, protecting from grease, spills

# Networking Needs



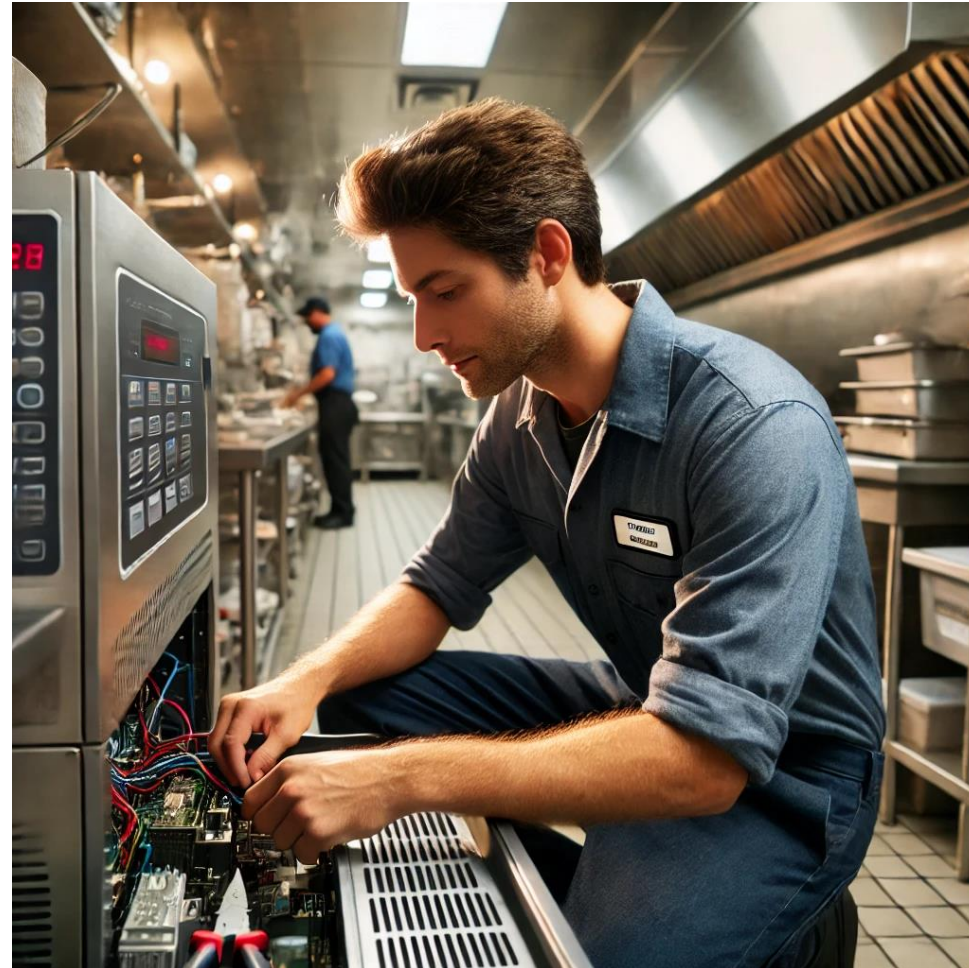
# If you build it, they will come

- **Two technologies that will always be used**
  - **Bandwidth**
  - **Data Storage**
- **LAN/WAN**
  - **More bandwidth – WAN fixed and 5G**
    - **Winners – 36x more likely to be using 5G, Growing 3x faster**
  - **LAN – Wireless speeds and data processing**
    - **RFID/Computervision, IoT, AI on the Edge**

# Networking Needs

- **Speed**
  - **Speed and latency**
  - **Drive Thru AI – processing speed, network speed**
- **Redundancy – AI is more network reliant**
- **Reduce interference**
- **Conduit, Wireless**

# Design for Support





# Support

- **Production Line Equipment**
- **Technology Access/Upgrades**
  - **IoT for Preventative Maintenance**
  - **Self-Healing or Self-Diagnosing Technologies**
  - **If dispatched, lowering time onsite**
    - **Adequate access, lighting, additional power**
  - **Support is HUGE area of leakage for IT budgets for retailers**
    - **Bad design is big part of this**
      - **Product Design**
      - **Process Design**

# Design for Production vs Customer Experience



## Importance of Production vs Hospitality Ratio

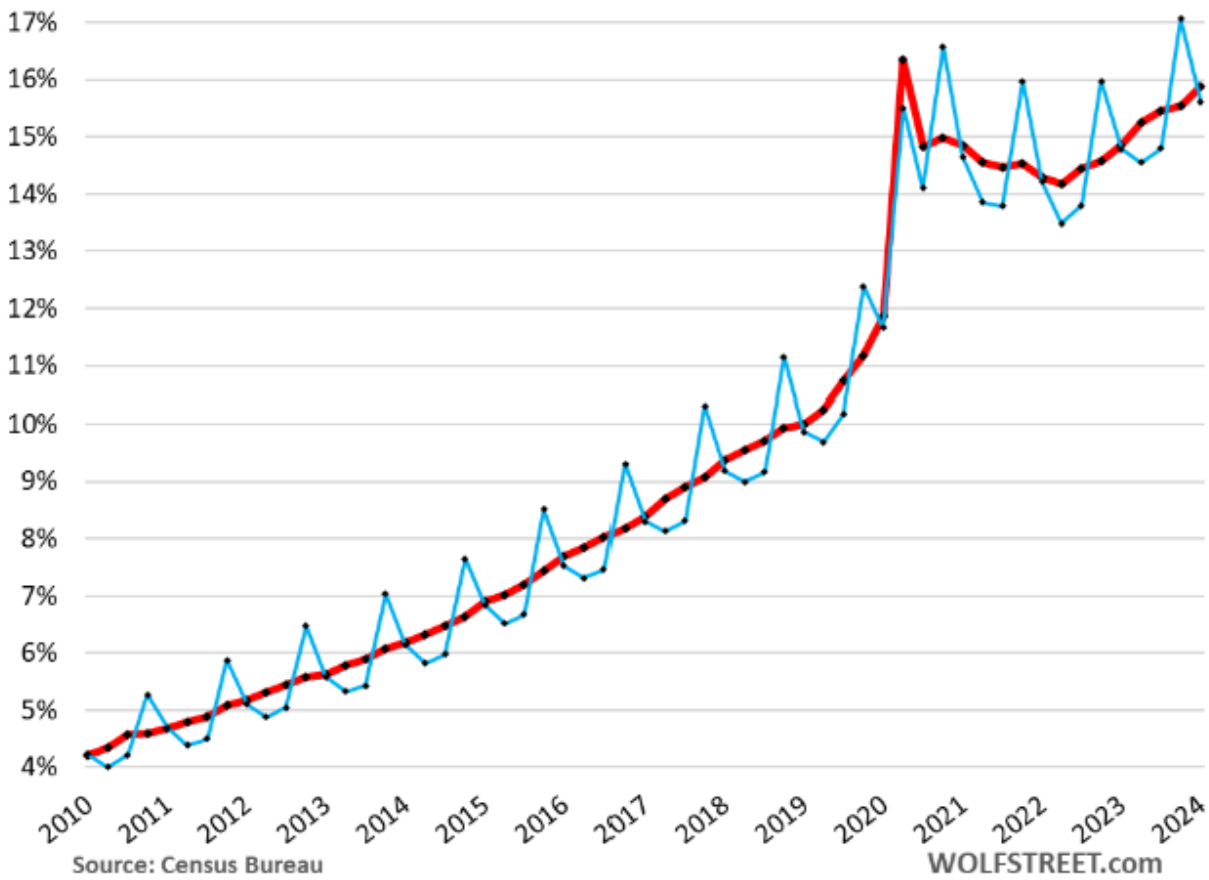
Designing stores with production vs. hospitality ratio in mind is crucial for providing a high-quality customer experience while also ensuring that systems are efficient and productive.

## Efficiency

An efficient design for production vs. hospitality ratio can help reduce costs and increase productivity, allowing you to better manage inventory, staff, and other resources.

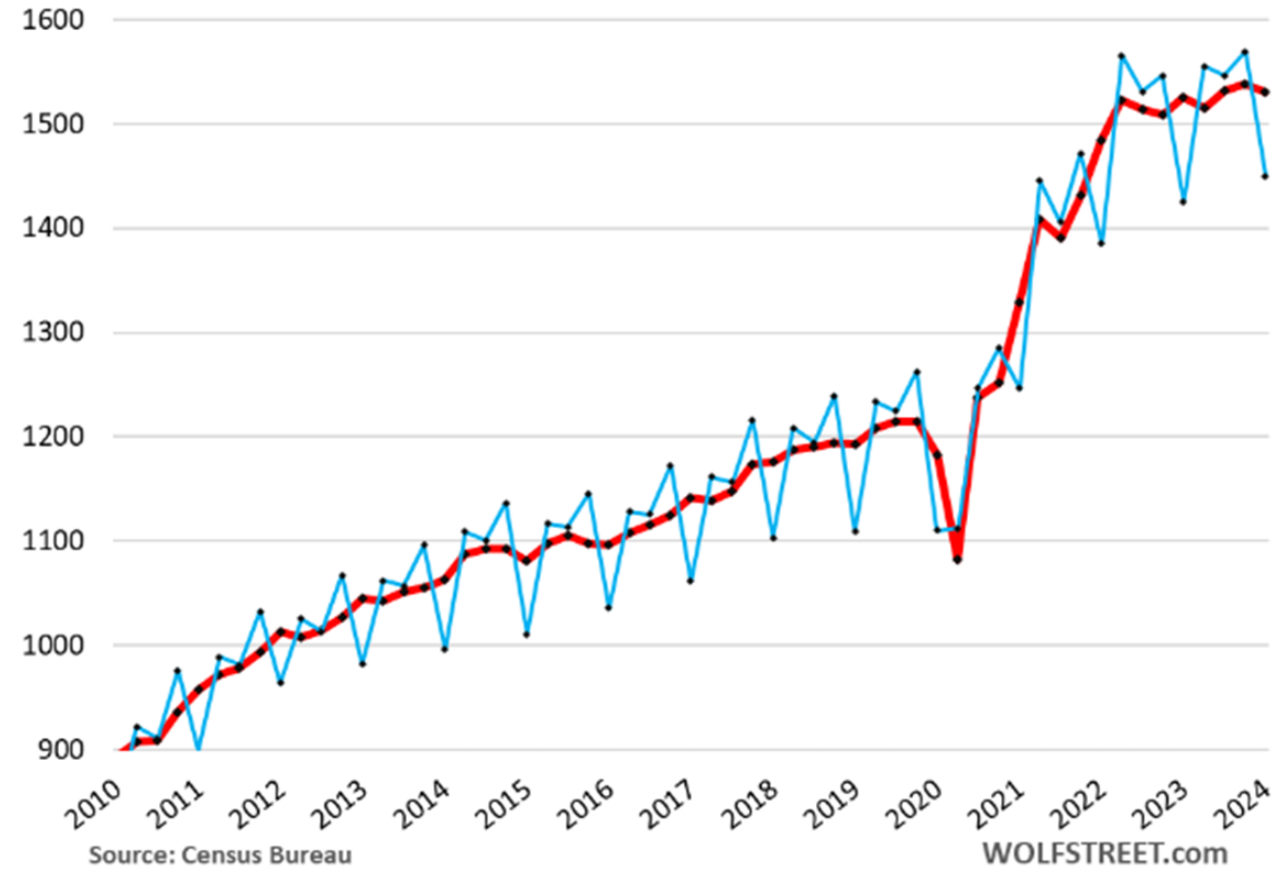
### Ecommerce as % of Retail Trade

Seasonally Adjusted, Not Seasonally Adjusted



### Retail Trade without Ecommerce Sales, Billion \$, Quarterly

Seasonally Adjusted, Not Seasonally Adjusted



# Optimized for E-commerce Meets Store



## **Dedicated Pickup AND Returns Areas**

Design your stores to provide a seamless and unified customer experience across all channels, including in-store, online, and mobile.

## **More space for inventory/storage – if Retail**

Optimize your inventory management to meet the needs of both in-store and online customers. Consider implementing a unified inventory system that allows you to manage inventory across all sales channels.

## **Communications Technologies – Walkie Talkie/Headset**

52% of chain retailers will leverage Wireless Communications for associates for pickup. 25% higher customer service rating when used.





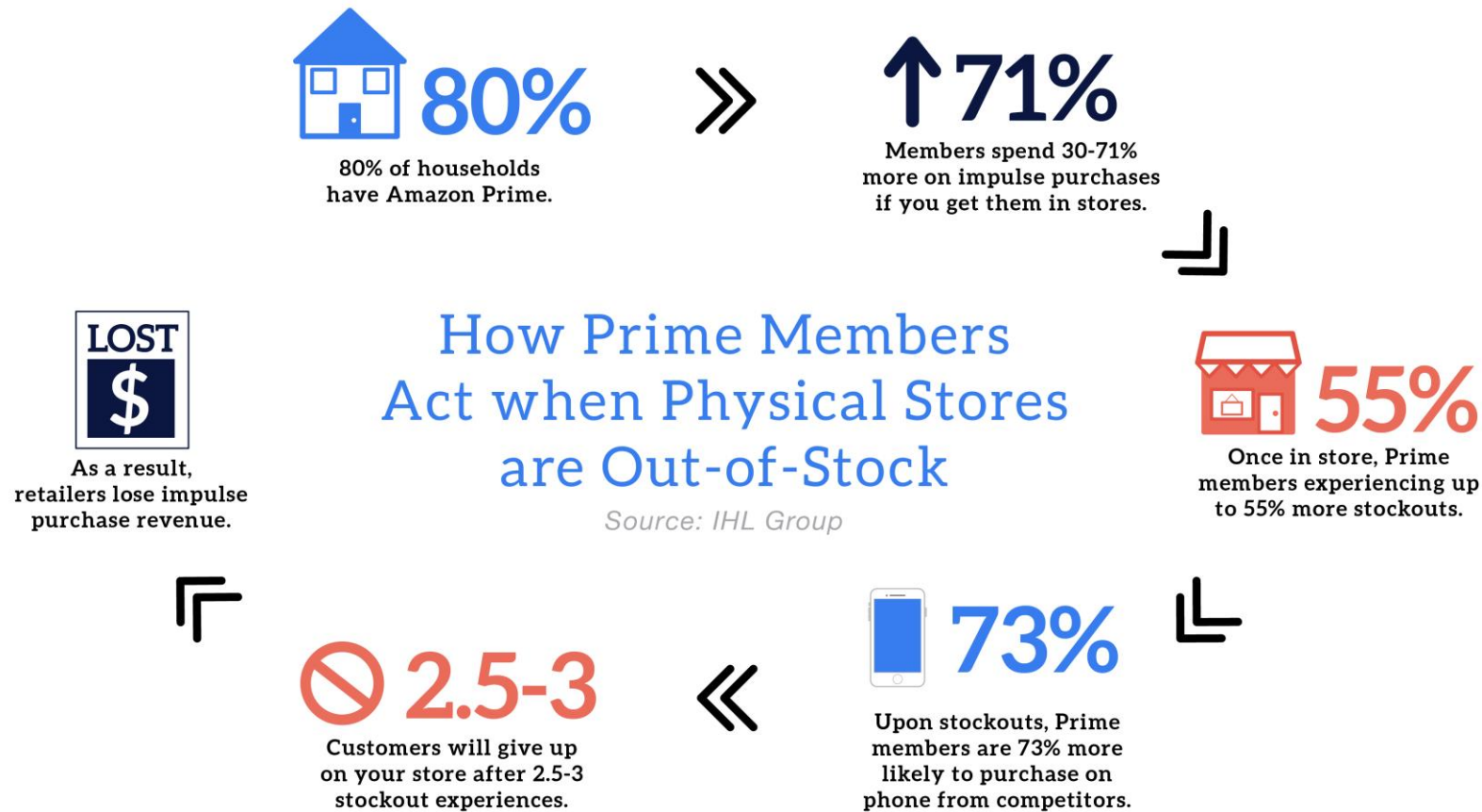
# More Customer Friendly Anti-Theft Design

Losses to Retail Theft  
(consumer & employee)  
in North America, 2024:  
**\$118.7 Billion**

Source: IHL Group

Retailers and restaurants also losing over \$20b in sales due to merchandise being locked up and consumers simply leaving.

# 13-22% of Retail Revenue comes from Impulse



# Generative AI Tools for Design and Project Management

- Re-Imagine Home
- Palazzo
- Paintit.AI
- Architect Render
- Virtual Staging AI
- VizualizeAI
- AITWO.CO
- RoomGPT
- Leiga
- BrainSoup
- TimeHero

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