



# Urban Freight Distribution Study

E-Commerce Trends and Implications for Regional Planning



Transportation Advisory Board

September 20, 2023

# Background



## Why study e-commerce trends and impacts now?

- Current growth trends in e-commerce activity are rapidly changing how and where consumers shop for goods
- Role of transportation in contributing to global climate change offers opportunities to consider new and more efficient systems and technologies
- Study identified in 2040 Transportation Policy Plan work program

# Study Purpose

## The purpose of this Study is to...

- Gain better understanding of trends in retail shopping/e-commerce purchases, warehouse/fulfilment center siting and operations, and last-mile parcel deliveries
- Estimate impacts of increasing e-commerce on the region's overall vehicle miles traveled (VMT) and associated greenhouse gas emissions (GHGs)
- Identify potential land use strategies to increase efficiency and reduce regional VMT
- Assess best practices in curbside management for commercial deliveries and last-mile modal technologies

# Study Purpose (2)

## The results of this Study will be used to...

- Inform the 2050 Transportation Policy Plan policies and implementing actions
- Inform the Land Use policies and actions in the 2050 Regional Development Guide
- Provide new guidance to local governments for developing and implementing Comprehensive Plans through updates to Met Council's technical planning guides

# Study Advisory Group

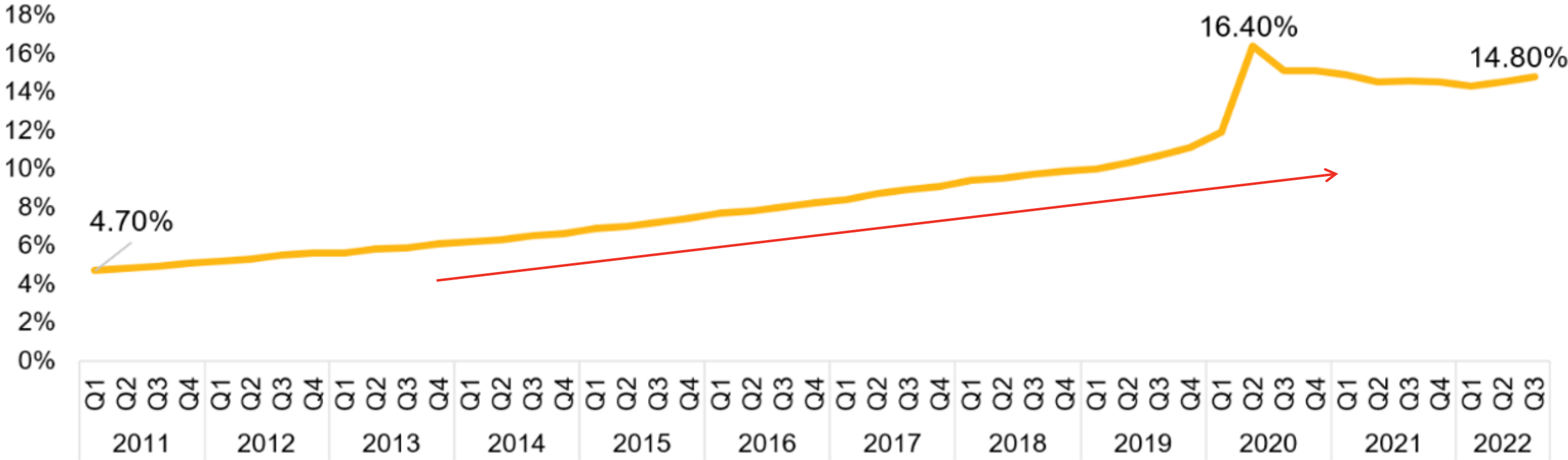
## Technical Advisory Group includes these planning agencies:

- MN Freight Advisory Committee
- Metropolitan Council
- MnDOT
- City of Saint Paul
- City of Minneapolis
- City of Eagan
- City of Lakeville
- City of Maple Grove
- City of Rogers
- City of Roseville
- City of Shakopee

- City of Woodbury
- Anoka County
- Carver County
- Dakota County
- Hennepin County
- Ramsey County
- Scott County
- University of Minnesota

# E-Commerce Trends

## US quarterly e-commerce sales as percentage of total retail sales



Source: CPCS analysis of Federal Reserve Economic Data, St. Louis Federal Reserve Bank, 2023.

# E-Commerce Trends (2)

## National trends in sales and deliveries

Largest e-commerce retailers

50%



The largest e-commerce retailers include Apple, Amazon, Walmart, Target, and eBay.

Largest e-commerce delivery providers

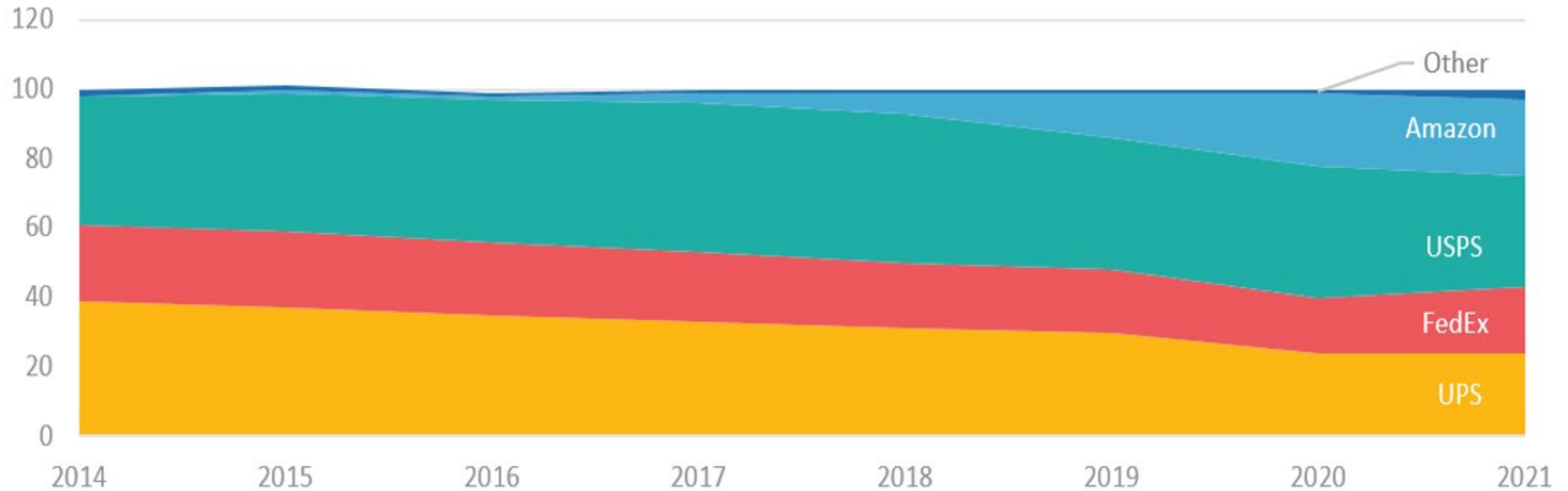
99%



The largest e-commerce delivery providers include the United States Postal Service, Amazon Logistics, UPS, and FedEx.

# E-Commerce Trends (3)

## Market share of U.S. parcel volume, 2014-2021



Source: Pitney Bowes



# Study Work Scope

The Study will have three main areas of focus:

## Part I: E-Commerce trends and sustainability impacts

- Trends in online purchases, shipping practices
- Impacts of e-commerce on regional vehicle miles traveled (VMT) and associated greenhouse gas (GHG) emissions

## Part II: Trends in siting of warehouse/distribution centers

- Trends in e-commerce fulfillment center siting and logistics management
- Opportunities for land use strategies to minimize VMT and GHGs

## Part III: Curbside management & new technologies for last-mile deliveries

- Best practices for managing curbside space for delivery vehicles and other users
- Opportunities for emerging technologies to reduce VMT and GHGs

# Study Work Scope (2)

## **PART I: E-Commerce Trends and Sustainability Impacts**

### **Key Research Question:**

To what degree does increasing e-commerce activity and its related changes in personal shopping trip behavior increase or decrease VMT & associated GHGs?

### **Key Work Tasks:**

1. Assess current trends in online consumer purchases and shopping behavior
2. Estimate net change in regional VMT due to e-commerce activity for current year and 2050 planning horizon
3. Estimate net change in fuel consumption and GHG emissions based on net VMT estimates

# Study Work Scope (3)

## PART II: Land Use and Siting Trends for E-Commerce Warehouse-Distribution Centers

### Key Research Question:

What are various regional-scale strategies for siting major warehouse/distribution centers that could minimize VMT & associated greenhouse gas emissions?

### Key Work Tasks:

1. Assess trends in warehousing/fulfillment center development and logistics management relating to e-commerce parcel distribution
2. Compare land use-related policies and strategies for managing the impacts of e-commerce parcel distribution in other cities and metropolitan regions in the U.S. and Canada
3. Investigate trends in retail store closures and adaptive reuse projects for e-commerce facilities
4. Identify potential policies, strategies and/or actions for the 2050 Transportation Policy Plan and 2050 Regional Development Guide

# Study Work Scope (4)

## PART III: Curbside Management and New Technologies for Last-Mile Deliveries

### Key Research Questions:

1. What are best practices for managing curb space for urban deliveries?
2. What new or emerging technologies hold the most promise for reducing VMT and overall emissions of greenhouse gases?; specifically, what are the potential benefits of promoting these or other emerging technologies for “last-mile” parcel deliveries?:
  - Air-based drones
  - Land-based drones (robots)
  - Cargo e-bikes
  - Automated (driverless) vehicles
  - Lower and zero-emission fuels



First Federal Aviation Administration Certification announced for commercial package delivery using drones April 25, 2019

# Study Work Scope (5)

## PART III: Curbside Management and New Technologies for Last-Mile Deliveries

### Key Work Tasks:

3. Research current trends and best practices in curbside management for urban deliveries
4. Research new and emerging technologies for performing last-mile deliveries
5. Identify potential policies, strategies and/or actions for the 2050 Transportation Policy Plan and 2050 Regional Development Guide

# Early Observations

## 1. There are 4 major e-commerce delivery providers, each with a processing and distribution network of facilities

- Major e-commerce delivery providers are UPS, FedEx, USPS, and Amazon
- FedEx is combining its Express and Ground operations, which will improve route efficiency and reduce its VMT
- Amazon is notable for using “Flex” drivers to deliver packages in private vehicles
- Typical service area for a last-mile delivery center is around 30 to 45-minute drive time
- Delivery vans vary in size but carry around 200 parcels per tour, on average



# Early Observations (2)

## 2. Urban densification typically increases demand for curb space for deliveries and passenger travel modes

- In dense urban areas such as in the Minneapolis' Warehouse District, curbside space is at a premium
- Curb access for delivery vehicles is important, particularly when a shop, business, or multi-unit building does not have dedicated off-street loading facilities
- Delivery vehicles may compete for space with parking or may be forced to navigate and occupy space for other uses such as bus lanes and bike lanes



# Early Observations (3)

## 3. Underused big-box retail stores are becoming more attractive for conversion and reuse as e-commerce last-mile delivery centers

- Traditional retail establishments, like shopping malls and big box stores, are in less demand
  - Walmart and Target recently closed big box stores in Brooklyn Center and Brooklyn Park
  - Some big box stores are converting floor space to storage and fulfillment functions





# Key Dates and Deliverables

Deliverable	Date
Project Kickoff	March 2023
Part III Draft Report: Curbside Management and Last-Mile Technologies	June 2023
Part II Draft Report: Land Use and Siting Trends for Warehousing and Distribution Centers	August 2023
Part I Draft Report: Sustainability Impacts	October 2023
Draft Final Report	Fall 2023
Final Report	January 2024

# Questions?

Thank you

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