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# CITY OF CAMBRIDGE

Community Development Department

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To: Yi-An Huang, City Manager  
From: Iram Farooq, Assistant City Manager for Community Development  
Date: June 17, 2024  
Re: 2023 Transportation Demand Management Program Report

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Attached is the 2023 Transportation Demand Management Program Report. This document describes results from 2023 transportation monitoring period. In 2022, the City resumed transportation monitoring after a pause during the first two years of the Covid-19 pandemic. The 2023 transportation monitoring results represent the program's first full year of monitoring since 2019.

# City of Cambridge

## Transportation Demand Management Program Report

### Results from 2023 transportation monitoring

### Summary

This report describes the results of the Cambridge Transportation Demand Management (TDM) Program’s annual transportation monitoring. It includes projects regulated under the Parking and Transportation Demand Management (PTDM) Ordinance and Planning Board Special Permits.

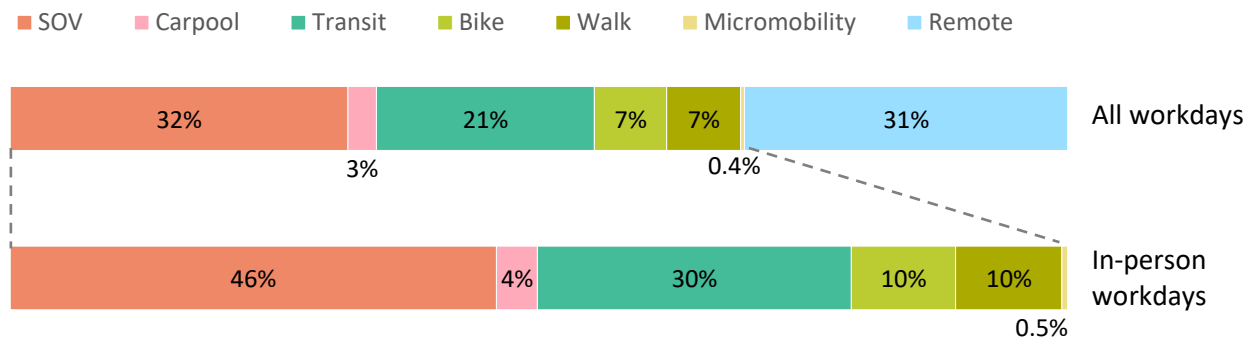
In 2022, the City resumed transportation monitoring after a pause during the first two years of the Covid-19 pandemic. The 2023 transportation monitoring results represent the program’s first full year of monitoring since 2019.

We received reports from 76 properties in 2023. The reports included information on commute programs required at the properties and a survey about how people traveled to the sites.

All projects receive letters about their compliance status in response to their reports. The letters offer detailed feedback and technical assistance to help projects reduce their single-occupancy vehicle (SOV) rates.

The mode share survey allows City staff to examine patterns in employee trips to work at TDM Program properties. In 2023, driving alone to work was the most common mode (32% of workdays), followed by working remotely (31%), taking public transportation (21%), biking (7%), walking (7%), carpooling (3%), and micromobility like e-scooters (less than 1%). This represents a significant change in the overall mode split from 2019, when remote work was less common.

**Figure 1. Employee commute mode share at TDM Program properties, 2023**



*Data source: 2023 Cambridge TDM Program Employee Survey*

This report also covers the most popular reasons for using each mode, what employees say would help them drive less, weekly remote work patterns, and resident and patron transportation choices. Future reports will include analysis of other survey questions and required commute programs.

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## TDM Program Overview

The City of Cambridge requires properties to participate in the TDM Program in two ways: through the PTDM Ordinance and through conditions on Planning Board Special Permits. The City requires about 100 properties to submit a report about their sustainable transportation programs and the transportation patterns of people visiting their sites every year. If a property is required to do monitoring and reporting, they begin reporting approximately one year after the new or renovated facility is occupied.

### Parking and Transportation Demand Management Ordinance

The [PTDM Ordinance](#), adopted in 1998, aims to reduce traffic congestion and greenhouse gas emissions, and improve traffic safety. It does this by promoting walking, bicycling, public transit, and other sustainable modes.

A property triggers the Ordinance if it meets all of these criteria:

1. It is non-residential,
2. It creates any new parking or changes who can use existing parking, and
3. The total number of parking spaces at the site is 5-19 (Small Projects) or 20 or more (Large Projects).

The Ordinance requires these projects to create a PTDM plan, which must be approved by the City. Large Project PTDM plans must include a commitment to reduce the percentage of people driving alone to the project and implement a range of transportation demand management measures. Large Projects must also monitor travel to the site and report on the status of the SOV commitment and TDM measures. Small Projects must implement at least three TDM measures, but there is no SOV commitment or annual monitoring.

A wide variety of measures have been implemented to meet PTDM SOV commitments. All PTDM plans include measures to promote walk, bike, transit, and carpool travel. However, the Ordinance allows property owners and employers to choose measures that are most appropriate for their site.

High-impact TDM measures include:

- Offering MBTA pass subsidies,
- Providing Bluebikes stations and offering annual memberships,
- Offering incentives for walking and biking,
- Charging people directly for parking, and
- Providing shuttle service to transit stations.

PTDM plans can also include supportive TDM measures that establish a culture of using sustainable transportation. Supportive measures include providing showers and changing facilities for people who walk or bike to work, reserved parking for carpools, and occasional parking for people who don't usually drive.

## Planning Board Special Permits

The City also makes TDM agreements with property owners through the [Planning Board Special Permit process](#). When the City expects that a project will have large transportation impacts, the Planning Board may include a TDM plan as a condition of the Special Permit. Some Special Permit TDM properties have SOV commitments like Large PTDM Projects, and some do not.

## Important Terms and Survey Information

**Transportation mode** is how a person gets around. The modes discussed in this report are:

- **Drive alone / Single-occupancy vehicle (SOV):** Using a private vehicle alone, including motorcycles, taxis, and ride-hail services like Uber and Lyft. Ride-hail was added to the TDM Program survey in 2017.
- **Carpool:** Using a private vehicle with one or more other people, including vanpools and shared ride-hail services like UberX Share or Lyft Shared. Shared ride-hail was added to the TDM Program survey in 2017.
- **Public Transit:** Using a bus, subway, train, trolley, ferry, or public or private shuttle.
- **Walk:** Walking or using a wheelchair.
- **Bike:** Riding a bike, including personal bikes and Bluebikes public bikeshare.
- **Other:** Using another method. “Other” is an option in Census Bureau surveys and appeared in TDM Program surveys before 2020.
- **Micromobility:** Using a scooter, skateboard, skates, or other micromobility device. These devices are sometimes but not always electric. Micromobility devices are not listed as options in Census Bureau surveys. In TDM Program surveys, micromobility devices were included under “Other” before 2020, when they became their own survey category.

A **sustainable mode** or **sustainable transportation option** is any mode other than driving alone.

All surveys used in this report ask what mode a person used for the longest part of their trip to work, school, shopping, or other activities. Of course, most trips include multiple modes. For example, someone who walked to their parked car, drove, parked, and then walked again to their destination would choose “drive alone” on a survey.

**SOV commitments** are commitments made by property owners to keep the percentage of people driving alone to the project below a certain level. SOV commitments are linked to a particular type of site user, like employees, students, residents, or patrons. Some properties have a single SOV commitment, and some have multiple commitments, depending on who is expected to visit the site. If a property has multiple commitments, they conduct one survey for each commitment type.

To interpret information about mode frequency in this report, it is important to know the TDM Program survey questions people are responding to:

- **Employees** and **commuting graduate students** answer how they got to or participated in work or school each day of the survey week.

- **Residents** answer how they got to or participated in work or school each day of the survey week and also how they *usually* participate in shopping, social activities, and medical appointments.
- **Patrons, visitors, patients, and guests** answer how they got to the location that day.

The **TDM Program** includes properties whose participation is required by the PTDM Ordinance or Planning Board Special Permit conditions.

Some sections of this report compare employees at TDM Program properties to the **Cambridge workforce**, which is all people who work in Cambridge, no matter where they live. Commute information for the Cambridge workforce comes from the U.S. Census Bureau. Other reports from Cambridge's Community Development Department sometimes include information about the **Cambridge labor force**, which is all Cambridge residents who work, no matter where they work. This report does not include information about the Cambridge labor force.

## 2023 Monitoring Results

The 2023 transportation monitoring results represent the TDM Program's first full year of monitoring since 2019. In 2022, the City resumed transportation monitoring after a pause during the first two years of the Covid-19 pandemic. In usual years, we have two monitoring cycles – spring and fall. In 2022, we conducted monitoring in fall only, which included roughly half of the properties in our program. The 2022 partial-year report is available on the TDM Program website, but the results will not be included in this or future reports because they do not represent a full year of monitoring data.

### Reports Received and Commitments Met

In 2023, we expected 46 Large PTDM Project reports and 32 Special Permit reports. We received all 46 Large PTDM Project reports and all but two of the expected Special Permit reports. The two properties who did not complete monitoring in 2023 are on track to be in compliance by June 30, 2024. There were 13 Small Projects that did not require monitoring.

The 2023 reports covered about 35,000 parking spaces, 21 million square feet of commercial development, and 18 million square feet of institutional (education and hospital) development. More than 57,000 employees (38% of Cambridge workers<sup>1</sup>), 10,000 students, and 7,000 residents work, study, and live at the properties that reported in 2023.

Large Project PTDM properties and some Special Permit TDM properties must include a travel-habit and mode share survey in their reports. The surveys help City staff:

- Check whether a project has met its SOV commitments (if applicable),
- Track transportation patterns and emerging trends, and
- Improve predictions about the travel patterns at future development sites.

Table 1 shows the 76 reporting projects' performance on their SOV commitments. Twenty-nine projects did not have any SOV commitments, and one project's 2023 survey was a baseline survey with no commitment this year. There were 46 projects with commitments to a maximum SOV mode share ranging from 6% to 66%. Two projects did not achieve a high enough survey response rate to reliably determine whether they met their commitments. Twenty-nine projects met all their SOV commitments, eight met at least some of their commitments, and seven did not meet any of their commitments.

Of the seven projects that did not meet any of their SOV commitments, six did not fully implement their required TDM measures, and five offered free or subsidized parking.

All projects receive letters about their compliance status in response to their reports. The letters offer detailed feedback and technical assistance to non-compliant projects. In some cases when a property has implemented all its required TDM measures and still does not achieve desired SOV levels, staff engages with owners to develop additional reasonable TDM measures. So far, the City has not needed to exercise any enforcement provisions in the PTDM or Zoning Ordinances.

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<sup>1</sup> The Massachusetts Department of Unemployment Assistance reported an average of 151,304 jobs in Cambridge during the second quarter of 2023. This figure does not include self-employed persons or sole proprietors.

**Table 1. SOV commitment performance at TDM Program properties, 2023**

<b>SOV commitments met</b>	<b>Number of projects</b>	<b>As a % of projects that submitted reports</b>	<b>As a % of projects w/2023 commitments</b>
Met all commitments	29	38%	63%
Met at least one commitment	8	11%	17%
Did not meet any commitments	7	9%	15%
Unknown (low response rate)	2	3%	5%
Baseline survey in 2023	1	1%	-
No commitment required	29	38%	-
<b>Total</b>	<b>76</b>	<b>100%</b>	<b>100%</b>

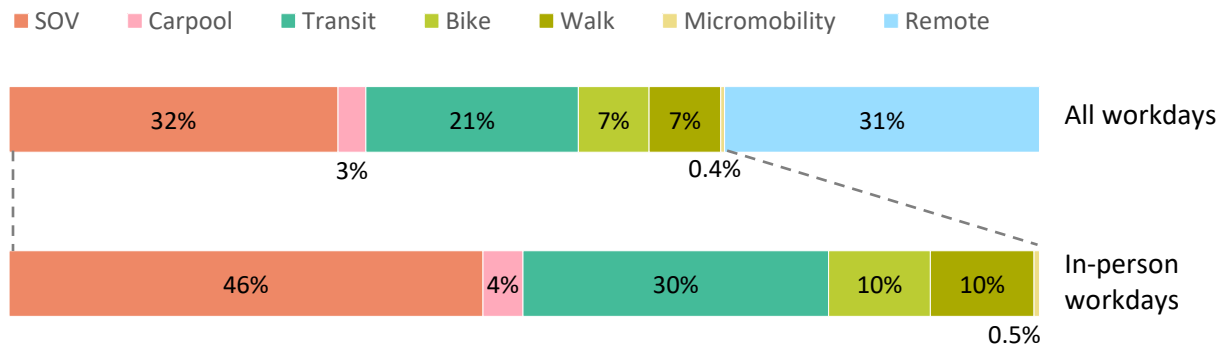


## Employee Survey Results

The TDM Program Employee Survey received 25,811 responses from workers at 364 offices, labs, restaurants, and stores across the program properties.

Figure 1 shows the commute mode share for these employees. Driving alone (SOV) was the most common way of getting to work (32%), closely followed by working remotely (31%). Workers used transit to get to work 21% of the time, biked 7%, and walked for 7% of workdays. Carpool (3%) and micromobility (0.4%) were the least common modes.

**Figure 1. Employee commute mode share at TDM Program properties, 2023**



*Data source: 2023 Cambridge TDM Program Employee Survey*

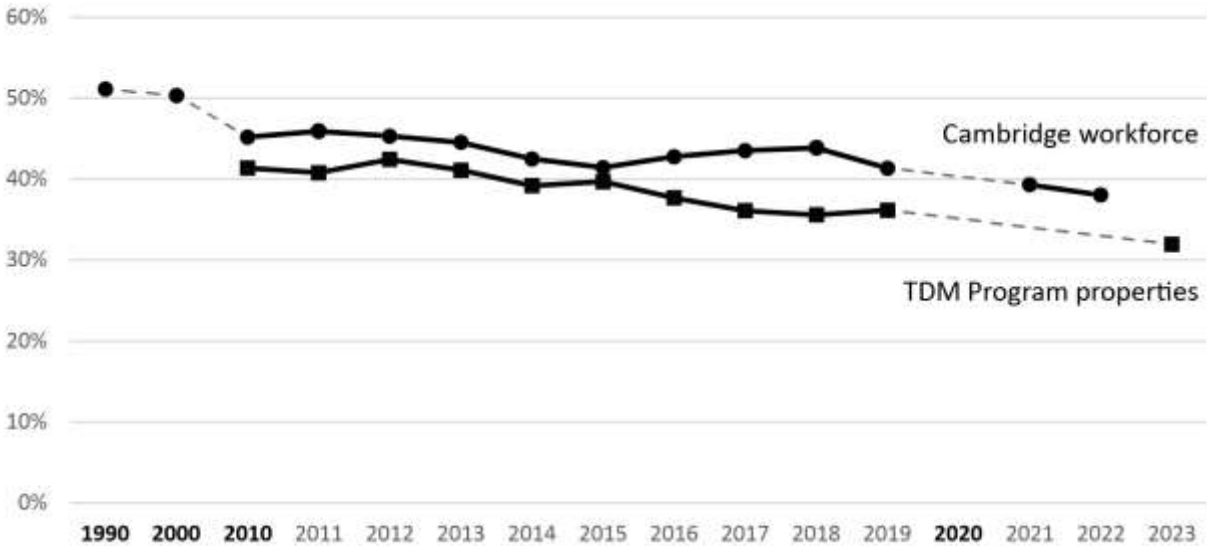
The lower bar in Figure 1 shows how employees commuted to work when they worked in person at their workplaces. Half of commutes to in-person work were made by car (46% driving alone and 4% in a carpool).

### Employee Survey: Historical Trends

Figure 2 shows the SOV rate for all Cambridge workers starting in 1990 and for properties in the TDM Program starting in 2010. The SOV rate for the Cambridge workforce has decreased over the past 40 years, and the properties in the TDM Program have followed the same trend, but a few percentage points lower. If we could compare TDM properties to non-TDM properties, we would likely see a bigger difference, but ACS data includes both types of properties.

Between 2019 and 2023, the SOV rate at TDM Program properties decreased from 37% to 32%. This is equivalent to reducing the number of vehicle trips by about 16,000 per week, or 840,000 total in 2023.

**Figure 2. Long-term trend: SOV mode share for Cambridge workforce and TDM Program properties, 1990-2023**



Data sources: Cambridge workforce: 1990 and 2000 Decennial Census, 2010-2022 ACS 1-year estimates, no data available for 2020. TDM Program: Cambridge TDM Program Employee Surveys, 2010-2023, no data available 2020-2022. Grey dotted lines show where more than one year separates the data points.

The Covid-19 pandemic caused a substantial disruption in how people get around. To better understand this year’s results, we can compare them to the transportation trends before the pandemic. Figure 3 compares commute modes for TDM Program properties in 2023 to recent, pre-pandemic commute modes (2010 to 2019).

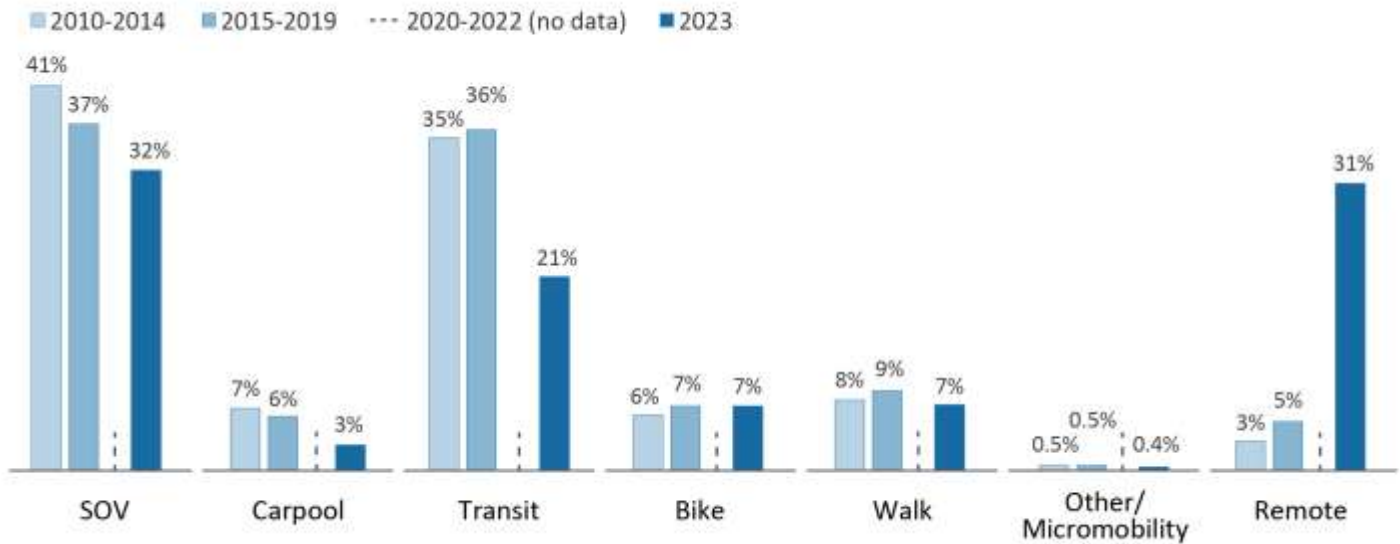
Driving alone and carpooling both decreased over the last decade, and this year’s results continue that trend. The share of commutes made by transit increased slightly from 2010 to 2019, but transit showed a sharp decrease in mode share this year. Biking, walking, and micromobility showed little change this year. The mode with the largest change from pre-pandemic years is remote work, which grew slightly over the previous decade but increased dramatically in this year’s results.

Figure 4 shows the mode share for all people who work in Cambridge over the same period. Data for this chart comes from the U.S. Census Bureau’s American Community Survey (ACS). Comparisons between the TDM Program results and the ACS results should be made cautiously because the surveys ask slightly different questions about travel to work. The City’s transportation monitoring survey asks respondents how they traveled *each day of the week*. The ACS asks how respondents *typically* traveled to work during the survey week.

One notable difference between the two data sets is the share of remote workers, which was much higher (31%) at 2023 reporting properties than Cambridge overall (17%) in 2022, the most recent year of ACS data available. This might reflect a real difference between reporting properties and all Cambridge workers. However, the difference might be due to differences in the survey questions. Someone who worked remotely only two days during a five-day week would not choose “remote” on the ACS survey, but the TDM Program survey would capture those trips.

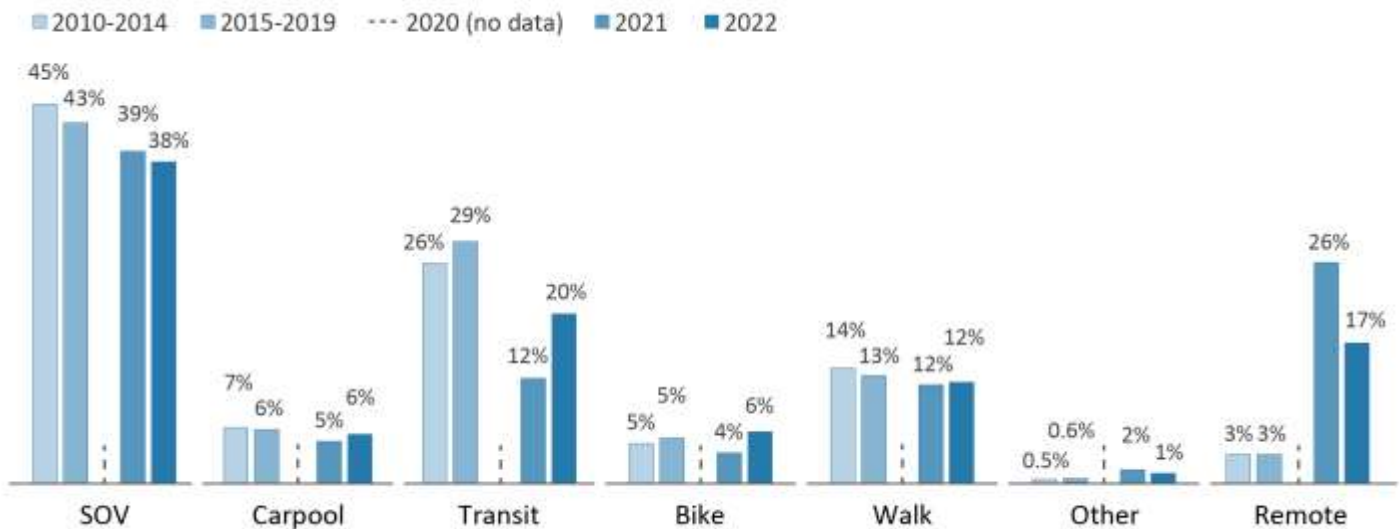
Like the TDM Program results, the ACS shows a disruption in transit commutes and remote work between 2019 and 2021. However, from 2021 to 2022, both transit and remote work shares trended toward their pre-pandemic levels, while SOV mode share did not increase. If the properties in the TDM Program follow a similar pattern, then a return to more typical in-person work rates may not produce an increase in the SOV mode share.

**Figure 3. Recent trends: Employee commute modes at TDM Program properties, 2010-2023**



Data source: 2010-2023 Cambridge TDM Program Employee Surveys. Surveys were not required from 2020 to spring 2022, and fall 2022 data is excluded from this chart, since it represents only half the properties in the TDM Program.

**Figure 4. Recent trends: Commute modes for people who work in Cambridge, 2010-2022**



Data source: American Community Survey 5-Year Estimates (2010-2014 and 2015-2019) and 1-Year Estimates (2021 and 2022), people over age 16 whose workplace is in Cambridge.

## Employee Survey: Remote Work

Because only about half of the TDM Program properties were required to conduct surveys in 2022, comparisons of the overall mode shares in 2023 should not be compared to 2022 data. However, it would be useful to know whether the share of people working remotely changed from 2022 to 2023. There were 20 properties who surveyed office or lab employees in both fall 2022 and fall 2023. Table 2 shows the remote work mode share for this group of workers across the two report periods. Remote work decreased by about 20% for the office and lab employees at these properties from 2022 to 2023.

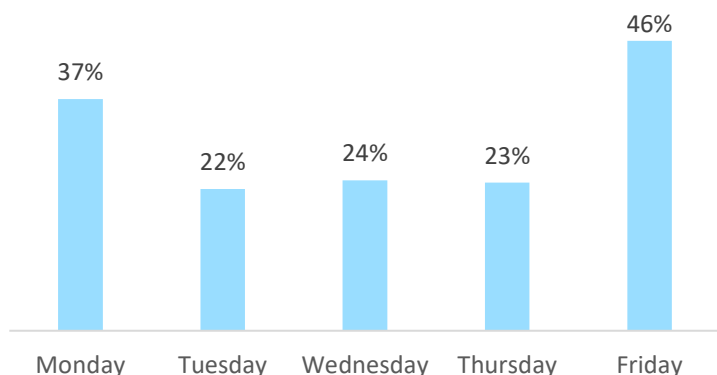
**Table 2. Share of workdays that were remote for office and lab employees**

Survey period	Office/lab remote mode share
Fall 2022	37%
Fall 2023	29%

*Data source: 2022 and 2023 Cambridge TDM Program Employee Survey. Includes Office/R&D employee surveys at properties that reported in both fall 2022 and fall 2023 (20 properties).*

Because the TDM Program Employee Survey captures daily variation, we can also examine remote work patterns over the course of the week. Figure 5 shows how many employees reported working remotely each day of the week in 2023. Remote work was more common on Mondays (37% of workers) and Fridays (46% of workers) than mid-week (22 to 24% of workers Tuesday through Thursday).

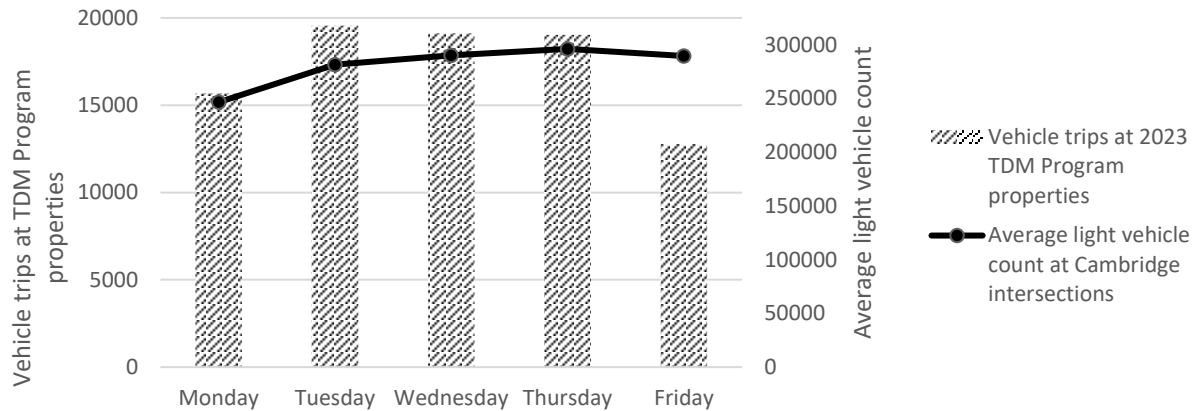
**Figure 5. Share of employees working remotely at TDM Program properties by day of the week, 2023**



*Data source: 2023 Cambridge TDM Program Employee Survey*

Figure 6 compares vehicle counts at Cambridge intersections to reported commute trips by day of the week. Miovision cameras count vehicles at 16 intersections across Cambridge. [Miovision Traffic Data](#) is available on Cambridge's Open Data Portal. The line in the figure shows the average traffic counts by day during the two TDM Program survey periods (April-May and September-October 2023). During the work week, average vehicle counts at intersections were lowest on Mondays and increased through the week, with a small decrease on Fridays. According to the 2023 TDM Program survey results, SOV and carpool trips were lower on Mondays and much lower on Fridays than mid-week. Together, these weekly patterns suggest that Friday is the weekday with the largest share of non-work trips using a vehicle.

**Figure 6. Comparison of intersection traffic and reported vehicle commute trips by day of the week, April-May and Sept-Oct 2023**



Data sources: 2023 Cambridge TDM Program Employee Survey and Miovision traffic cameras (4/1/23 to 6/3/23 and 9/3/23 to 11/4/23). “Vehicle trips” includes SOV and carpool trips.

#### Employee Survey: What Affects Workers’ Transportation Choices

The employee survey asks several questions about why people choose to get to work the way they do. For each mode, people choose the reasons they take that mode to work or school. The top five most popular reasons for each mode are shown in Table 3.

Key takeaways include:

- “Most convenient way to get around” appears in the top reasons that people gave for all mode choices.
- Financial considerations (“Cheapest way to get around,” “I have free/affordable parking,” “Parking is too expensive”) appear in the top reasons for all modes except carpooling and biking.
- “Better for the environment” appears in the top reasons for carpooling, biking, and walking.
- Carpooling, biking, and walking’s most popular reasons are connected to positive aspects of those modes (“To help someone going my way,” “Fun/pleasant way to get around,” “For exercise”), while reasons for taking transit seem to be more about reasons for not driving (“Too much traffic,” “Driving is too stressful,” “Parking is too expensive”).

**Table 3. Top 5 reasons for taking different modes, 2023**

Why do you...

	Drive alone?	Carpool?	Use transit?	Bike?	Walk?
1	Most convenient way to get around	Most convenient way to get around	Most convenient way to get around	For exercise	For exercise
2	Fastest way to get around	To help someone going my way	Too much traffic	Fun/pleasant way to get around	Fun/pleasant way to get around
3	For errands before/after work	Better for the environment	Cheapest way to get around	Fastest way to get around	Most convenient way to get around
4	Bus or train is unreliable	Fun/pleasant way to get around	Driving is too stressful	Most convenient way to get around	Cheapest way to get around
5	I have free/affordable parking	I do not drive	Parking is too expensive	Better for the environment	Better for the environment

Data source: 2023 Cambridge TDM Program Employee Survey

The survey also asks what would help people drive less. Respondents can choose factors from a list of 22 options that include incentives, changes to infrastructure, expanded transit service, changes to life circumstances, and supportive programs. Table 4 shows factors chosen by at least 10% of respondents.

**Table 4. What would help you drive less? (Factors chosen by more than 10% of respondents)**

What would help you drive less?	Chosen by ...
More reliable buses and trains	42%
More frequent buses and trains	39%
Expanded bus/subway/commuter rail routes	36%
Living closer to work	26%
Extra pay not to drive	25%
Permission to work at home	22%
Workplace shuttle available/improved	20%
Safer bike routes	14%
Help paying for bus/train fare	14%

Data source: 2023 TDM Program Employee Survey

## Residential Survey Results

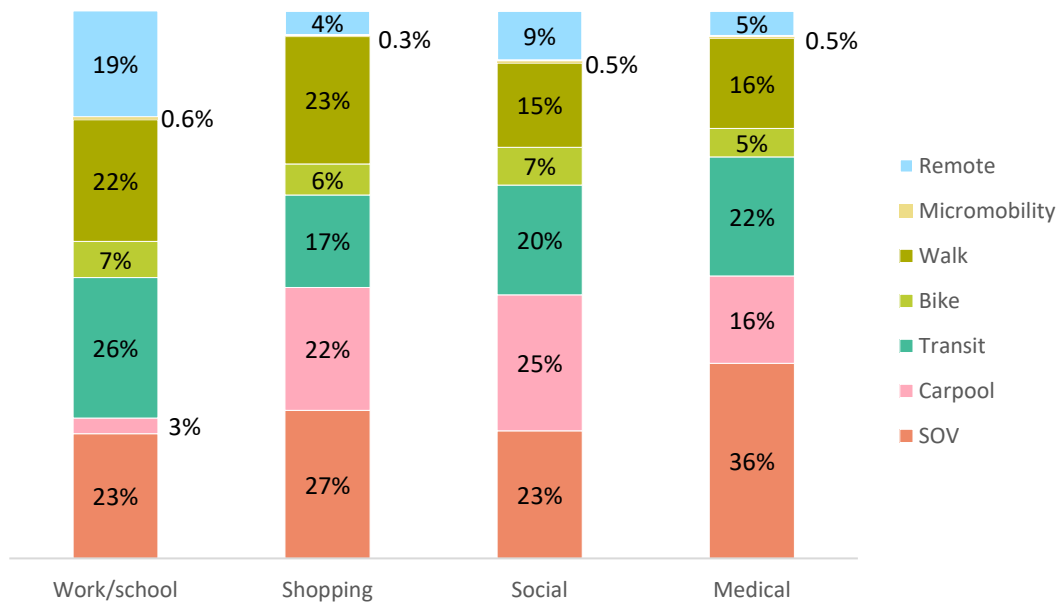
The 20 residential properties who surveyed residents in 2023 received about 3,000 total survey responses. These properties are mostly located near Lechmere and Kendall squares, and in Alewife. Due to their concentration in these areas, the results in this section should not be considered representative of the travel choices made by Cambridge residents overall.

The resident survey includes mode questions for four different trip purposes: work or school (commute), shopping, social, and medical trips. The work or school question for residents is identical to the commute question in the employee survey—the survey asks how the person participated in work or school each day of the survey week. However, in the questions about shopping, social, and medical activities, the survey asks how the person *usually* participates in those activities. Therefore, comparisons between the work/school responses and the responses for other activities should be made cautiously.

Residents reported attending work or school remotely at lower rates (19%) than respondents to the employee survey (31%). The walk mode share for work or school trips was much higher for residents (26%) than respondents to the employee survey (7%).

About 5% of residents said that they usually shopped and went to medical appointments remotely. Nine percent said that they usually participated in social activities remotely.

**Figure 7. Resident mode share for all activities, 2023.**



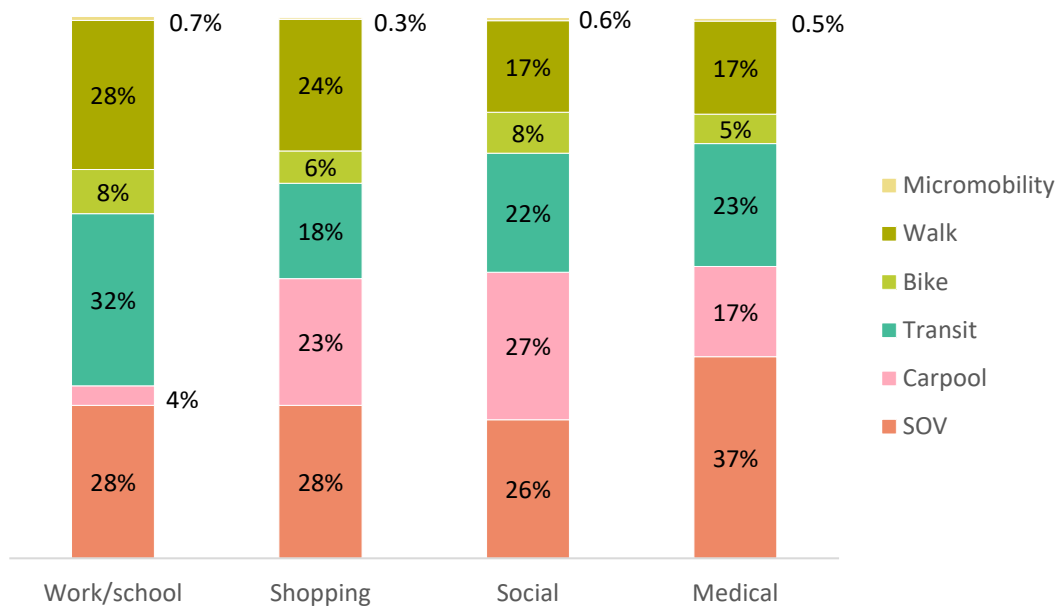
Data source: 2023 Cambridge TDM Program Resident Survey

Transportation studies of non-work trips generally focus on in-person participation, so the remainder of this analysis focuses on in-person modes (Figure 8). More than half of residents said that they usually use a vehicle for in-person shopping, social, and medical trips, but often with other people. Carpooling was the most common mode for social visits, and the carpooling mode share for all non-commute trip purposes (17% to 27%) is much higher than the carpooling mode share for commuting (4%). 37% of

residents said that they drive alone to medical appointments, the highest SOV mode share across trip purposes.

Transit was a much more common choice for work trips than any other trip purpose, but 18% of residents still said that they used transit for shopping trips, the trip purpose with the lowest rate of transit use. The bike mode share was fairly consistent across trip purposes, ranging from 5% for medical appointments to 8% for social visits. A large share of residents (24%) said that they usually walked to do their shopping.

**Figure 8. Resident in-person mode share for all activities, 2023.**

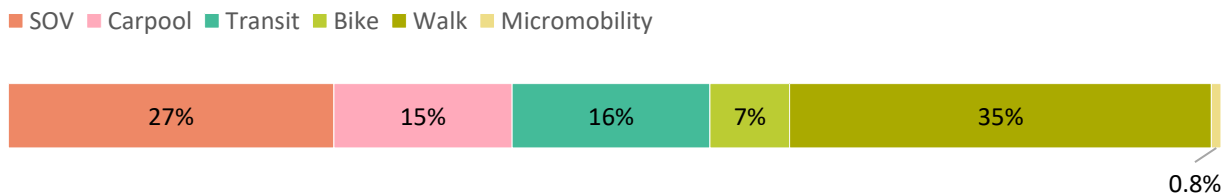


Data source: 2023 Cambridge TDM Program Resident Survey

### Patron Survey Results

About 4,200 patrons of retail and restaurant locations at reporting properties responded to the patron survey in 2023. Walking was the most common patron mode choice, followed by driving alone, taking transit, carpooling, and biking. Future reports will monitor changes in the patron mode share over time.

**Figure 9. Patron mode share, 2023**



Data source: 2023 Cambridge TDM Program Patron Survey



## Future Reports

Future reports will include analysis of additional questions in the TDM Program Surveys and evaluations of required TDM measures.

For more information or questions about Cambridge's TDM Program, contact the Cambridge PTDM Planner, Ryan McKinnon, at [rmckinnon@cambridgema.gov](mailto:rmckinnon@cambridgema.gov) or 617-349-7240.