Yale University 2015 Sustainable Transportation Survey Report

September 2016

A campus-wide transportation survey was first created and distributed in 2007 to provide Yale University with an accurate baseline assessment of its transportation and parking initiatives and how the university population commutes to and from campus. Now conducted biennially, the results from these surveys constitute a baseline for the University to measure progress against itself and compare to other similar institutions. In addition, the data lends support for implementing programs and initiatives that will help increase the use of more sustainable modes of transportation, rather than driving alone, and provide direction for new transportation initiatives.

As the vast majority of undergraduates live on-campus and do not commute, they are excluded from the transportation surveys. At the time of the first survey in 2007, Yale's employee and graduate population was 19,914 (70% employees and 30% graduate students). By Yale's eighth transportation survey in 2015, the population had risen to 20,155 (66% employees and 34% graduate students).

Introduction

In October 2015, Yale faculty, staff, postdoctoral researchers, and graduate and professional students were surveyed to track their commute behavior and patterns over time. Working with a larger total population than previous years, a representative sample of 1,170 was used for the survey.

The comparison chart below indicates the changes in population from 2013 to 2015. Since 2013, the total population has grown by 2.18%.However, the proportion of each affiliation category to the total population has remained relatively steady.

University Affiliation	Total Population		% of Total		Sample Size	
	2015	2013	2015	2013	2015	2013
Faculty	3745	3532	19%	18%	217	179
Postdoc	1137	1118	6%	6%	66	56
C&T Employee	3559	3636	18%	18%	207	184
M&P Employee	3985	3968	20%	20%	231	201
S&M Employee	960	995	5%	5%	56	50
Graduate Student	6769	6476	34%	33%	393	327
Total	**20155**	**19725**	**100%**	**100%**	**1170**	**997**

Table 1: Yale University Population and Transportation Survey Sample Size (2013 and 2015)

One of the goals of providing more sustainable transportation options on the Yale campus is to reduce vehicle-related greenhouse gas emissions. Therefore, the more relevant target audience is Yale employees. Although employees comprise 66% of the total population, they represent over 90% of the population utilizing Yale's parking facilities.

Report Highlights

Most Yale commuters utilize sustainable transportation modes.

- In 2015, the majority (61%) of Yale commuters utilized sustainable transportation methods, i.e., transit (24%), walking (22%), biking (9%), ridesharing (5%), and telecommuting (2%), while 39% used a single-occupancy vehicle.
- The commuting habits of Yale employees have changed slightly since 2013, with the most notable difference found in the 4% decrease in ridesharing. Driving alone increased by 0.15% and transit ridership increased by 0.7%. Walking increased by 3% and biking and telecommuting remained steady since 2013. A significant decrease in gas prices since 2013 likely contributed to higher drive alone rates in 2015.

Employee commute satisfaction is higher for those who drive alone less often.

- Employees who never drive alone to campus have the highest commute satisfaction, while those who drive alone every day have the lowest.

More employees are utilizing the Yale Shuttle.

- Overall transit ridership by employees remained steady at 22% between 2013 and 2015. However, 10% of all employees used the Yale Shuttle as their primary commute mode, compared to 8% in 2013.
- Use of the Yale shuttle for travel between campus locations increased by 10%.

More employees who drive alone to work would switch to alternative modes if provided incentives.

- The most popular incentives are: (1) monthly cash allowance in exchange for parking space; (2) flexible hours to accommodate transit or rideshare schedule; and, (3) free use of CTTransit buses.

The same three reasons for driving alone have been the most common since 2009: irregular hours on campus, need car for errands or appointments, and driving alone takes less time.

- "Infrequent special circumstances" was added as a new choice in 2015, and was the fourth most popular choice.

More employees are living closer to campus.

- Over one-third of employees lived in New Haven in 2015, an increase of 4% since 2013.
- Employees who live in New Haven drive alone to campus much less often than those living in surrounding towns.

Awareness of important Yale sustainable transportation programs remains low.

- Commuter awareness of important services such as customized commuter counseling from CTRides, the NuRide commuter rewards program (a new survey choice in 2015), and departmental Zipcar accounts remains below 30%.

The Yale community believes global warming is happening and is worried about it.

- Among all employees and graduate students, 93% believe that global warming is at least probably happening, and 75% believe it is definitely happening.
- Forty-five percent are "very worried" about global warming and 44% are "somewhat worried."

Methodology

Yale's transportation survey was conducted primarily online, but was also distributed in paper form to employees who do not have regular internet access at work. These employees received the survey from their department supervisors. The survey asked faculty, staff, and graduate students about the commute modes they used to get to campus the week of October 26 - 30, 2015. It was three pages long with 22 questions, many of which were open-ended for individual responses.

Survey Process

The survey used a stratified random-sample methodology that followed guidance developed by the U.S. Environmental Protection Agency for evaluating commuter benefit programs pursuant to air quality regulatory requirements for states.[1] The method used to determine Yale's sample size also followed these guidelines: a sample size of 1,170 is prescribed for organizations with 20,000 or more individuals. 2015 was the first year for which the university population size was over 20,000, making this the largest sample size ever used for the transportation survey. Of the 20,155 full-time commuting employees and graduate students, the graduate student population represented 33.6% or 6,769, and employees represented 66.4% or 13,386.

Using a random skip interval of applicable employees and students in the following stratified categories, six separate sample survey tracts were constructed.

Category	Population	Population (%)	Sample Size (Rounded)	Survey Responses	Survey Responses (%)
Faculty	3745	18.58%	217	217	18.54%
Postdoc	1137	5.64%	66	67	5.70%
C&T Employee	3559	17.66%	207	208	17.69%
M&P Employee	3985	19.77%	231	232	19.73%
S&M Employee	960	4.76%	56	56	4.76%
Graduate Student	6769	33.58%	393	395	33.59%
Total	**20155**	**100.00%**	**1170**	**1176**	**100.00%**

Table 2: 2015 Transportation Survey Population

Sample returns reflect only the first survey responses up to the goal number in each category. The target response rate was met in all population categories.

The survey provided both quantitative data on campus commuting and qualitative data for Yale to use as supportive information for implementing campus-wide transportation demand measures (TDM). The first 18 questions were required, with the exception of questions #3 (gender) and #7 (age), which were optional. Question 19 was the dividing question for respondents who never drive alone to campus and those who do. The latter group went on to the second part of the survey

[1] See *Guidance for Quantifying and Using Emission Reductions from Best Workplaces for Commuter Programs in State Implementation Plans and Transportation Conformity Determinations* (U.S. Environmental Protection Agency, 2005).

expressly designed for collecting information about respondents in the sample who drive alone to campus. Respondents who indicated that they never drive alone to campus ended the survey at question 18.

In the combined employee and student results, 34% indicated they drive alone to campus five days per week and 31% drive alone less often. Thirty-five percent indicated they never drive to campus. Therefore, of the 1,170 total in the sample, only 761 respondents went on to the second part of the survey. Since questions 19 through 22 were not required, not all respondents answered every question. In addition, this section was designed for gathering opinions about possibilities for changing commute behavior, so many of the questions allowed respondents to select multiple answer choices.

Baseline Trips and Mode Split Process

Data results from survey question 9, "Please indicate how you commuted to campus each day last week, October 26 – 30, 2015," were totaled for each day by 15 different commute methods. The data was then totaled by trips per week for each mode and summarized into the commute trips chart provided below. To arrive at the total one-way trips by all employees and students, the total number of Yale's 20,155 employees and graduate students was multiplied by the number of days in the work/class week (five). The result equaled 100,775 estimated total trips taken by all commuters at the University. Respondents who were not on campus are not counted in the trip chart below.

Commute mode	Trips taken by sample population	÷	Total trips taken by sample population	=	Proportion of trips by mode	x	Total one-way trips (total population x five days)	=	Estimated trips by total population
Drive alone	2189	÷	5,627	=	38.90%	x	100,775	=	39,203.21
Carpool[2]	254	÷		=	4.51%	x		=	4,548.93
Vanpool[3]	6	÷		=	0.11%	x		=	107.46
Public transit[4]	1355	÷		=	24.08%	x		=	24,266.95
Bicycle	494	÷		=	8.78%	x		=	8,847.14
Walk	1231	÷		=	21.88%	x		=	22,046.21
Telecommute	98	÷		=	1.74%	x		=	1,755.10
TOTAL	5627	÷		=	100.00%	x		=	100,775.00

Table 3: 2015 Mode Split Calculation

[2] A carpool carries two to six passengers, including the driver.
[3] A vanpool carries seven or more passengers.
[4] Public transit includes the Yale Shuttle, Shore Line East and Metro North Trains, CTTransit Bus, and Amtrak.

Commute Mode Split Trends

The charts in this section illustrate the 2015 mode split and trends since 2013. In 2015, the majority of Yale commuters utilized sustainable transportation methods, i.e., transit (24%), walking (22%), biking (9%), ridesharing (5%), and telecommuting (2%), while 39% drove a single-occupancy vehicle.

The commuting habits of Yale employees have changed slightly since 2013, with the most notable difference being a 4% decrease in ridesharing. Driving alone increased by 0.15% and transit ridership remained steady at 22%. Walking increased by 3% and biking and telecommuting remained steady since 2013.

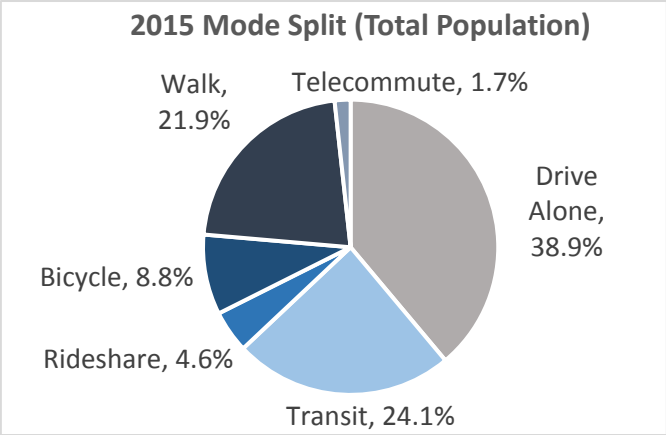


Chart 1: 2015 Mode Split (Employees and Graduate Students)

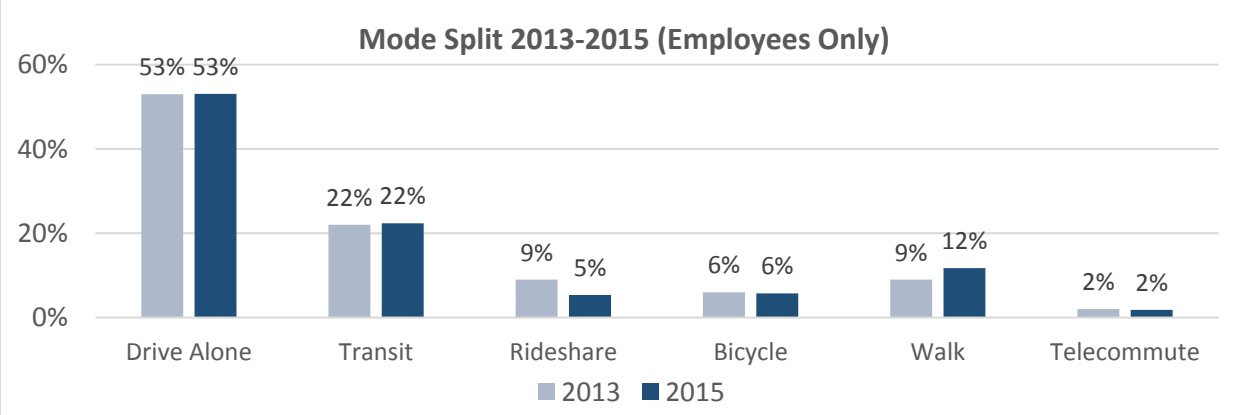


Chart 2: 2013-2015 Mode Split (Employees Only)

As shown in Chart 3 below, employees drive alone to campus much more often than graduate students. Graduate students walk and bike more often, as they typically live closer to campus. These differences are consistent with survey results from previous years.

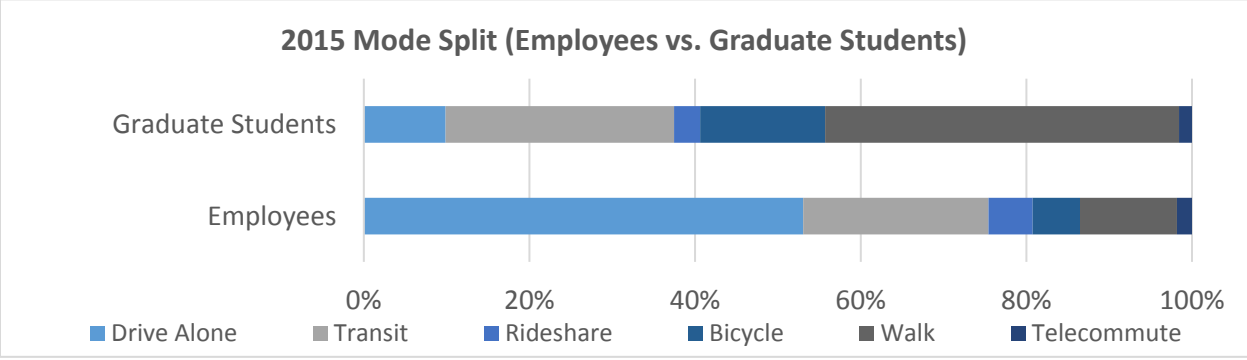


Chart 3: 2015 Mode Split (Employees versus Graduate Students)

Commuting habits of graduate students changed slightly since 2013, as shown in Chart 4 below. The most notable difference is a 7% decrease in biking. Walking also decreased by 3%, while driving alone increased by 3.9%. Transit ridership increased by 7% and ridesharing increased by 1%.

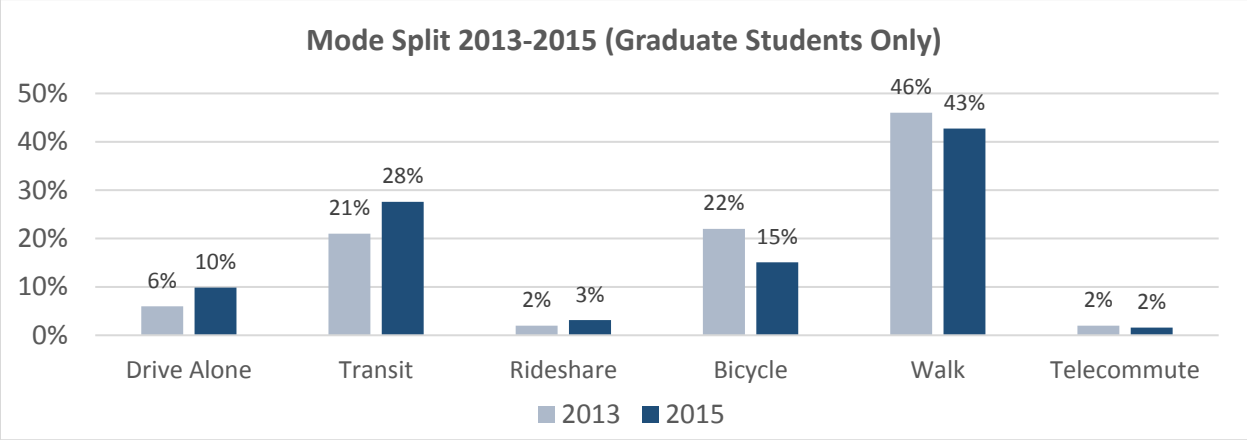


Chart 4: 2013-2015 Mode Split (Graduate Students Only)

Respondents were also asked whether they travel between campus locations during their day, and if so, what methods of travel they use. Respondents were able to choose more than one travel mode. Chart 5 below illustrates the change in campus travel modes from 2013 to 2015.

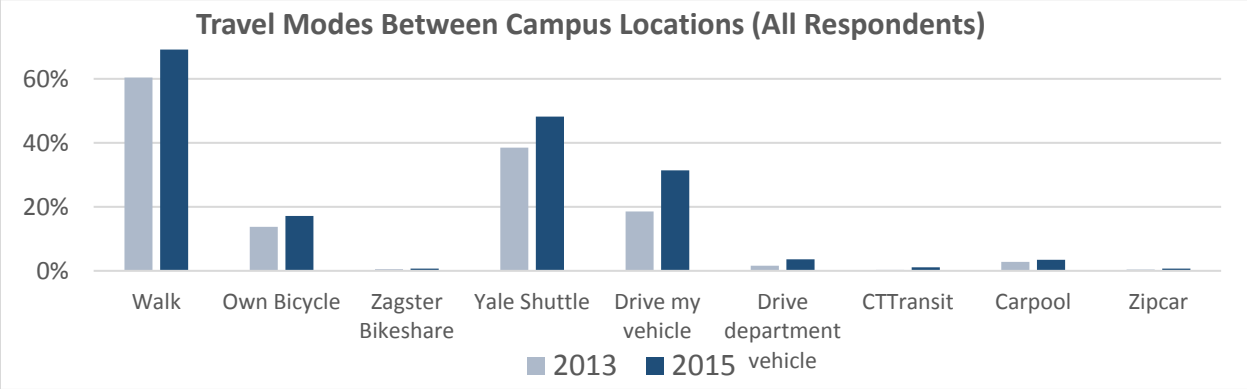


Chart 5: Travel Modes between Campus Locations for All Respondents (2013-2015)

The greatest difference in campus travel modes from 2013 to 2015 is a 13% increase in personal vehicle use. Use of the Yale shuttle has increased by 10% and walking and biking have increased 9% and 4%, respectively.

Employee Top Ten Zip Codes

In the 2015 survey results, 34% of Yale employees live in New Haven (zip codes 06511, 06515, and 06510), with the surrounding towns of Hamden and Guilford rounding out the top three towns, as shown in Table 4 on the following page.

2013		
Towns	**Percent**	**Zip Codes**
New Haven	30%	06511, 06515, 06510
Hamden	10%	06517, 06514
Branford	6%	6405
Guilford	5%	6437
North Haven	4%	6473
East Haven	3%	6512
New Haven	30%	06511, 06515, 06510

2015		
Towns	**Percent**	**Zip Codes**
New Haven	34%	06511, 06515, 06510
Hamden	11%	06517, 06514
Guilford	4%	6437
Branford	4%	6405
West Haven	3%	6516
North Haven	3%	6473
Cheshire	3%	6410

Table 4: Top 10 Zip Codes for Employees (2013-2015)

The geographic location of Yale employees has changed slightly since 2013. The top four towns, New Haven, Hamden, Guilford, and Branford, have remained the same since 2012. However, the zip codes in West Haven and Cheshire are now on the top ten list, while East Haven and Wallingford have dropped off since 2013.

Most importantly, it appears that more employees are living closer to campus since 2013. Over one-third of employees live in New Haven, an increase of 4%. The percentage of employees living in the nearby town of Hamden has also increased slightly, while percentages of employees living in towns farther away have decreased. Chart 6 shows that more employees are living in New Haven in 2015 than in any prior survey year.

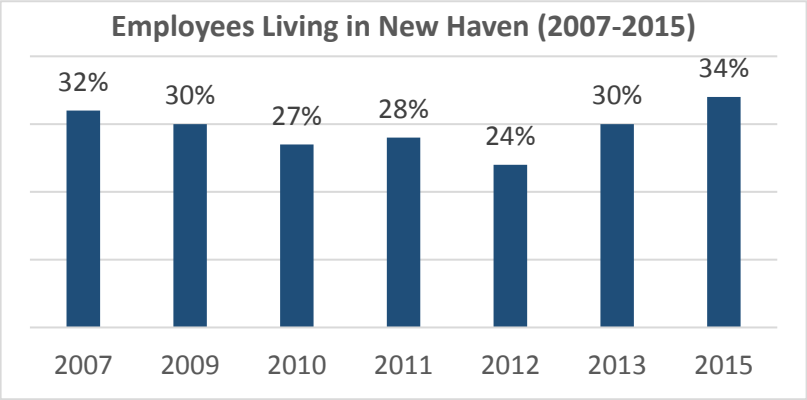


Chart 6: Employees Living in New Haven (2007-2015)

This is significant because, as shown below, Yale employees living in New Haven tend to have more sustainable commutes than those living in surrounding towns. The University is committed to neighborhood revitalization in the city of New Haven through initiatives such as the Yale Homebuyer Program, which provides up to $30,000 for employees to buy homes in New Haven and has benefited nearly 1,200 faculty and staff since its creation in 1994.[5] In addition, Yale's New Haven Hiring Initiatives program provides jobs and training opportunities for New Haven residents.[6]

Beginning in 2013, data was calculated for employee-only commute trips by zip code and by mode in order to gain a better understanding of the modes employees are using to commute from the top ten zip codes listed above. Table 5 below provides detail on where the majority of Yale's employees commuted from and their mode choice in 2015.

[5] See http://news.yale.edu/2015/12/07/university-renews-yale-homebuyer-program-another-two-years.
[6] See http://www.yale.edu/hronline/nh-hiring.html.

Zip Code	Town	Percent of Employees	Drive Alone	Transit	Bike	Walk	Rideshare	Other[7]	Total
06511	**New Haven**	**26%**	13%	31%	14%	34%	3%	4%	100%
06517	**Hamden**	**8%**	63%	16%	8%	0%	7%	6%	100%
06515	**New Haven**	**5%**	53%	20%	11%	2%	12%	3%	100%
06437	**Guilford**	**4%**	62%	21%	0%	0%	12%	5%	100%
06405	**Branford**	**4%**	68%	29%	0%	0%	0%	3%	100%
06514	**Hamden**	**4%**	76%	18%	4%	0%	0%	3%	100%
06516	**West Haven**	**3%**	66%	20%	0%	0%	12%	2%	100%
06473	**North Haven**	**3%**	78%	17%	0%	0%	3%	3%	100%
06410	**Cheshire**	**3%**	75%	10%	0%	0%	5%	10%	100%
06510	**New Haven**	**3%**	5%	16%	8%	66%	2%	2%	100%

Table 5: Commute Mode Split for Top 10 Employee Zip Codes (2015)

As expected, the drive alone rates for employees living in New Haven are much lower than those for surrounding towns, with 24% on average across all three New Haven zip codes as compared to 70% on average from the other top zip codes.

Employee Commute Satisfaction

The 2015 transportation survey asked respondents to indicate how satisfied they are with their current commute. Chart 7 below shows that commute satisfaction for employees varies greatly based on how often they drive alone to work.

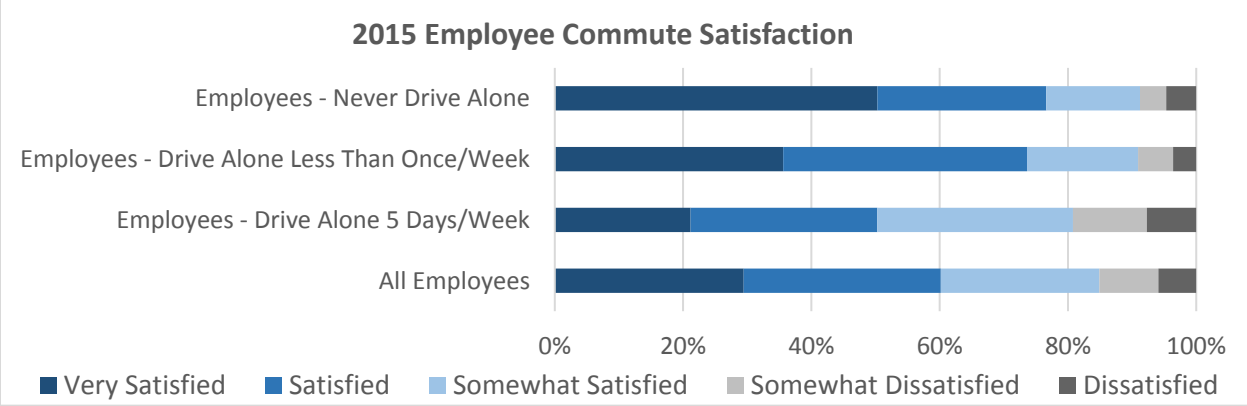


Chart 7: 2015 Employee Commute Satisfaction

Employees who never drive alone to campus have the highest satisfaction, while those who drive alone every day have the lowest. On average, employees who drive alone to work occasionally (less than once per week) are 6% more satisfied[8] with their commute than those who drive alone five

[7] "Other" includes telecommute and out of office.
[8] The average of "very satisfied" and "satisfied."

days per week. This trend is not unique to the Yale community – in general, drivers tend to be less satisfied with their commute than those who use other modes.[9]

Public Transit Mode Comparison

Overall transit ridership by employees remained steady at 22% from 2013 to 2015. However, 10% of all employees use the Yale Shuttle as their primary commute mode, compared to 8% in 2013.

The Yale Shuttle has remained the most frequently used transit mode since the first transportation survey in 2007. In 2015, nearly half of all employees using public transit indicated that they use the Yale Shuttle, a 10% increase since 2013, as shown in Chart 8 below. The use of CTTransit buses[10] and Metro North trains has also increased slightly, while Shoreline East ridership has decreased.

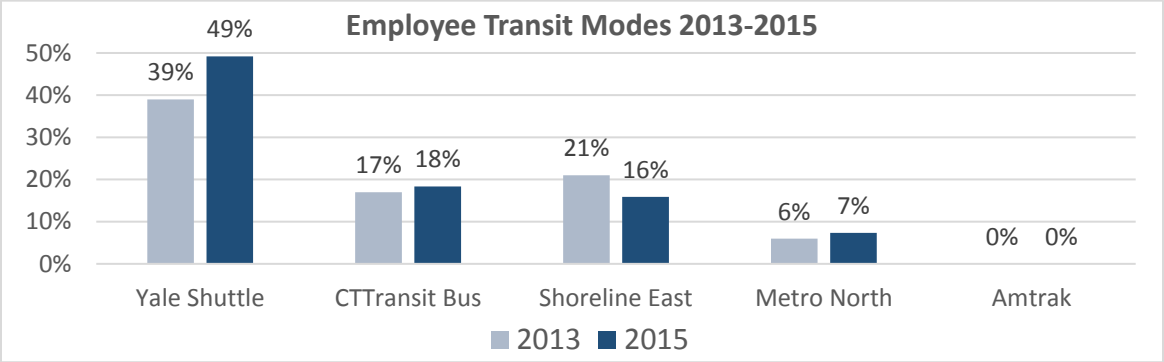


Chart 8: 2013-2015 Employee Transit Modes

In 2015, a new question was added to the transportation survey to assess how often Yale community members take the train to select destinations: New York City, New York; Boston, Massachusetts; Springfield, Massachusetts; and, along the Connecticut Shore Line. Chart 9 below shows the results from this question, excluding "Never" responses.

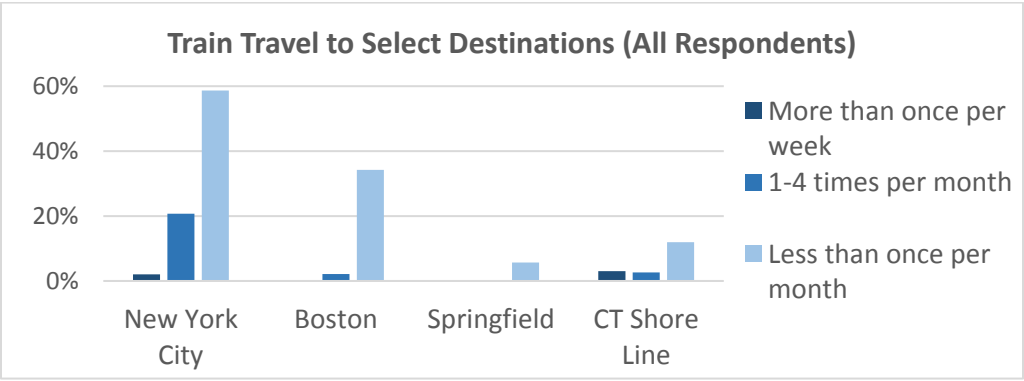


Chart 9: Train Travel to Select Destinations (All Respondents)[11]

[9] See http://www.citylab.com/commute/2014/08/which-mode-of-travel-provides-the-happiest-commute.
[10] Includes mode choices "CTTransit Bus" and "CTTransit Express Bus."
[11] Excludes "Never" responses.

New York City is the most popular destination, with nearly a quarter of all survey respondents traveling there via train at least once per month. Springfield is the least popular, with 94% of respondents indicating they never travel there via train.

Incentives to Stop Driving Alone to Campus

Survey respondents who drive alone to campus were asked whether various incentives would change their transportation mode choice. Chart 10 below shows the percentage of employees who indicated they may switch based on these incentives.

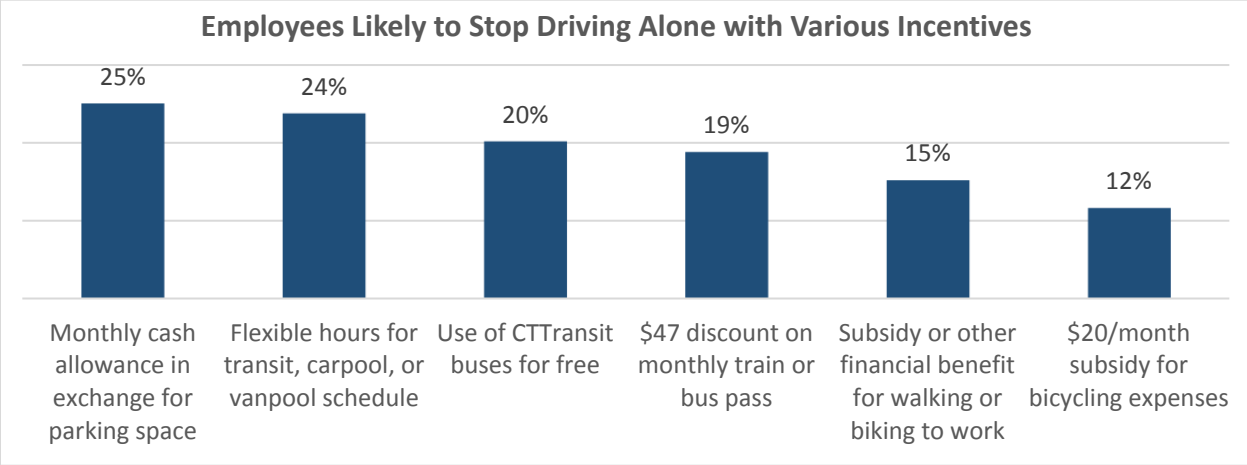


Chart 10: Percentage of Employees Likely[12] to Stop Driving Alone with Various Incentives

The top three incentives in the 2015 survey that could motivate employees who drive alone to work to switch to alternative modes are as follows:

1. ***Monthly cash allowance in exchange for parking space***: 25% of Yale employees who drive alone to work indicated on average[12] that they would likely change their mode choice if they received a monthly cash allowance in exchange for their parking space. Using a rule of thumb for actual behavior change that only 10% of those who answer a "what if" choice question would actually consider switching modes, this could mean a potential of 184 employees would likely change.[13] This incentive rose from the second-most popular in 2013 to the most popular in 2015.

2. ***Flexible hours to accommodate transit, carpool, or vanpool schedule***: 24% of Yale employees who drive alone to work indicated on average that they would change their mode choice if they had flexible hours to accommodate transit, carpool, or vanpool schedules. Using the calculation outlined above, this could mean a potential of 175

[12] "Likely" is the average of "very likely" and "somewhat likely" responses.
[13] The actual change number is based on the 2015 drive alone rate of 55% or 7,362 employees. Of the employees who drive alone, 25% say they would likely change or 1,841 employees. Recognizing the probability that 10% of the 1,769 would likely change, approximately 184 employees might actually switch from driving alone to using alternative modes.

employees who would likely change. Interest in this incentive decreased slightly since 2013, when it was the most popular choice.

3. ***Use of CTTransit buses for free***: 20% of Yale employees who drive alone to work indicated on average that they would change their mode choice if they were able to use CTTransit buses for free, resulting in a potential 148 who would likely change. Interest in this incentive increased slightly since 2013, replacing "a $47 discount on monthly train or bus pass" as the third-most popular choice.

Yale University can use this data to assess different ways to decrease the drive alone rate for employees and either create new programs or expand education and outreach on existing ones. For example, the University already offers resources for employees and their supervisors to propose flexible scheduling.[14]

Reasons for Driving Alone

Table 6 below shows that the top five reasons for employees driving alone have been fairly consistent since 2013. The same three reasons have been the top choices since 2009, although in 2015 "need car for errands or appointments" rose to the second most popular since 2013.

2015	
Hours on campus are irregular	41%
Need car for errands or appointments	41%
Driving alone takes less time	38%
Infrequent special circumstances (event, dinner, late workday, etc.)	34%
Enjoy my privacy, prefer to drive alone	26%
2013	
Hours on campus are irregular	28%
Driving alone takes less time	24%
Need car for errands or appointments	23%
Need car in case of emergencies	16%
Enjoy my privacy, prefer to drive alone	15%
2012	
Hours on campus are irregular	27%
Need car for errands or appointments	23%
Driving alone takes less time	22%
Transit does not work with my schedule	18%
Need car in case of emergencies	17%

Table 6: Top Five Reasons for Employees Driving Alone (2012-2015)

It is important to note that "infrequent special circumstances" was added as a new option in 2015, and was the fourth most popular choice.

[14] See http://www.yale.edu/hronline/worklife/workflex.html.

Another factor affecting driving rates is the price of gas. Drive alone rates rose 0.15% for employees and 4% for graduate students between 2013 and 2015. Since the transportation survey was not conducted in 2014, it is not possible to assess whether drive alone rates steadily increased between 2013 and 2015, or if there was perhaps a sharper increase in 2015 due to lower gas prices and other factors. In New Haven, gas was about $1.20 cheaper per gallon during the week that the 2015 transportation survey was conducted than the week of the 2013 transportation survey, as shown in Chart 11 below.

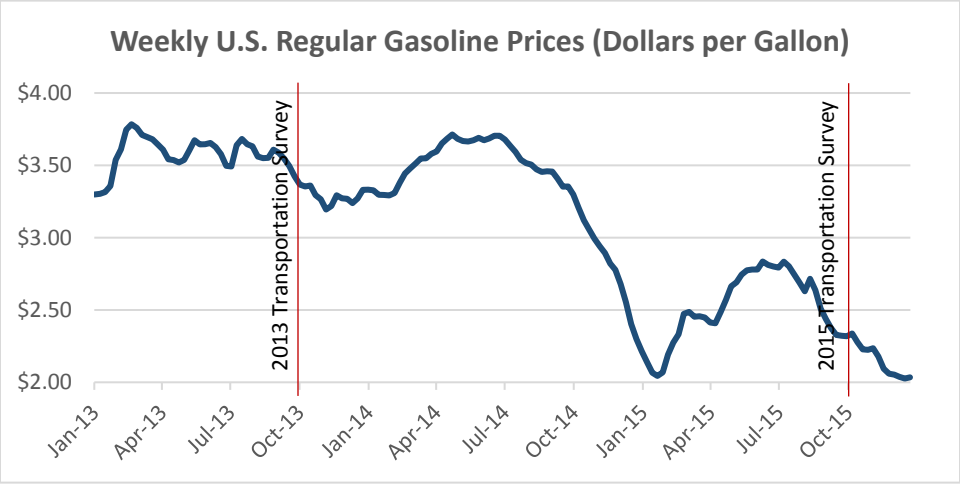


Chart 11: Average U.S. Regular Gas Prices (2013-2015)

The decrease in gas prices could contribute to the higher drive alone rates among Yale commuters. In addition to increased single-occupancy vehicle travel, lower gas prices have "hidden costs" such as more pollution, energy consumption, and traffic congestion.[15]

Employee Vehicle Type

Chart 12 below shows employee commute vehicle type trends between 2013 and 2015. Notably, ownership of hybrid or alternative fuel vehicles continues to rise, now making up 10% of all employee commute vehicles. In addition, the decrease in mid-sized vehicles and increase in economy vehicles may indicate that employees are switching to smaller, more efficient cars.

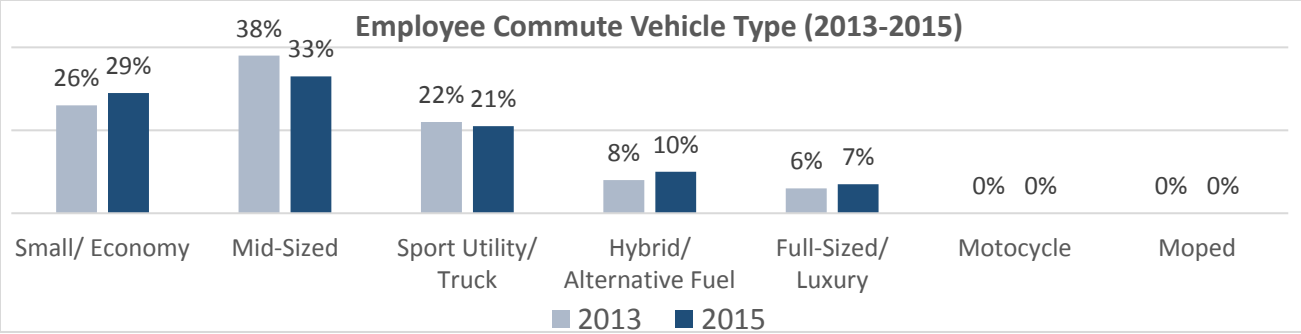


Chart 12: Employee Commute Vehicle Type (2013-2015)

[15] See http://usa.streetsblog.org/2015/11/19/the-high-price-of-cheap-gas/.

Reducing Transportation Emissions

Yale has committed to a 43% reduction in greenhouse gas emissions from 2005 levels by 2020, including those from employee commuting. Therefore it is critical that more of Yale's commuting population shift from driving alone to transit, ridesharing, bicycling, walking, and teleworking.

It is important to note that alternative transportation modes produce significantly less greenhouse gas emissions than single-occupancy vehicles – rail transit produces up to 75% less and bus transit 32% less. In addition, the more passengers that ride transit, the lower the emissions per passenger mile.[16]

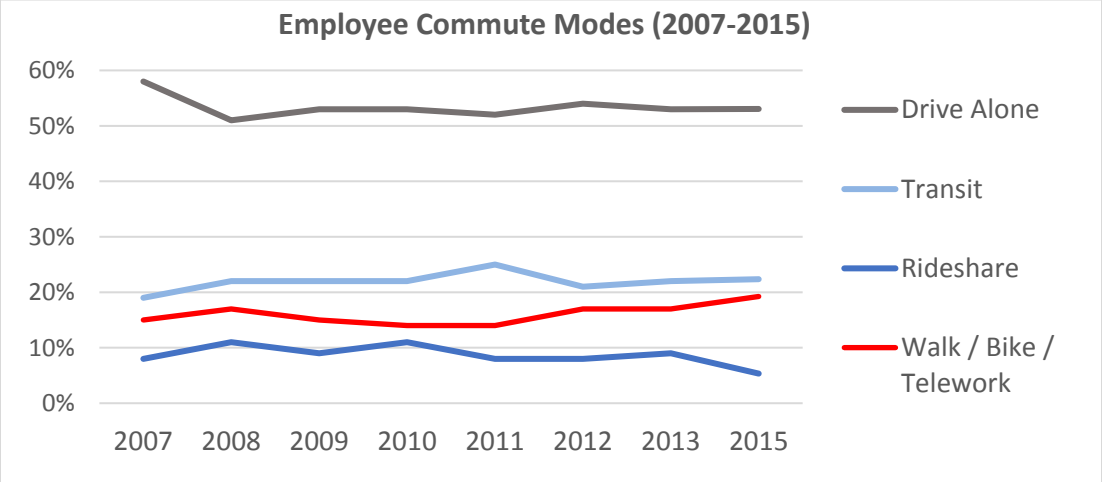


Chart 13: Employee Commute Modes (2007-2015)

Employee use of transportation modes that cause no CO_2 emissions (walking, biking and teleworking) has increased slightly since 2013 to 19%, as shown in Chart 13, due to an increase in walking. It is important to point out that bicycling to campus and telecommuting remained the same since 2013, at 6% and 2% respectively. It will take additional incentives to motivate employees to switch to zero-emission modes and further reduce greenhouse gas emissions.

Commuter Awareness of Yale Transportation Services

Since 2012, all Yale commuters have been asked if they know that Yale offers various commuter services in order gauge how well the University is marketing these services.

As illustrated in Chart 14 below, employee knowledge of services such as the TransLoc shuttle smartphone app, Zipcar, pre-tax savings on transit passes, and the Zagster bikeshare system remain high. In fact, employee participation in the Federal Pre-Tax Commuter Benefits Program has increased by 6% since 2013.[17] In addition, awareness of the Zagster, bicycle safety training, and daily parking rate programs has increased significantly since 2013.

[16] See http://www.fta.dot.gov/documents/PublicTransportationsRoleInRespondingToClimateChange.pdf.
[17] See *Yale Sustainability Strategic Plan Progress Report 2015*.

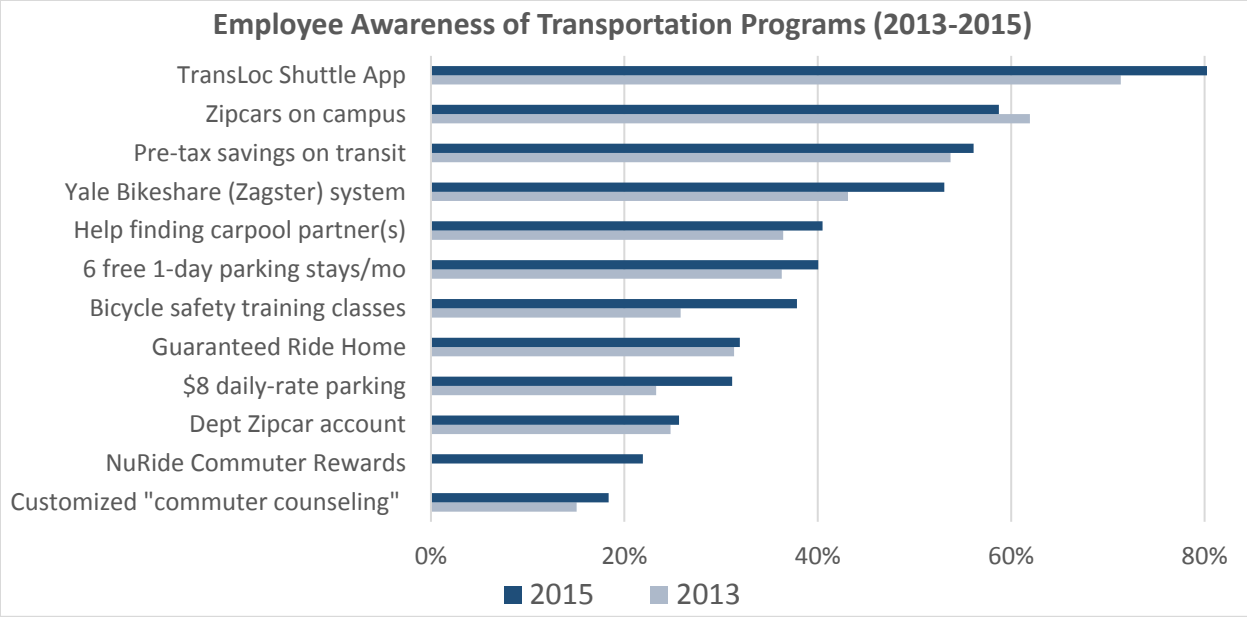


Chart 14: Employee Awareness of Commuter Services at Yale (2013-2015)

However, awareness of important services such as customized commuter counseling from CTRides, the NuRide commuter rewards program (a new survey choice in 2015), and departmental Zipcar accounts remains below 30%. Efforts are being made to increase awareness of these programs. For example, in fall 2015, the Office of Sustainability began presenting at every Yale New Employee Orientation, discussing programs such as NuRide and additional transportation options on campus.

The results of this analysis clearly highlight the incentives that Yale could focus their marketing efforts on in order to increase the number of commuters taking advantage of these existing services. Increasing awareness of existing programs would be a very cost effective way that the University could potentially increase use of alternative transportation among the current commuting population.

Perceptions of Global Warming

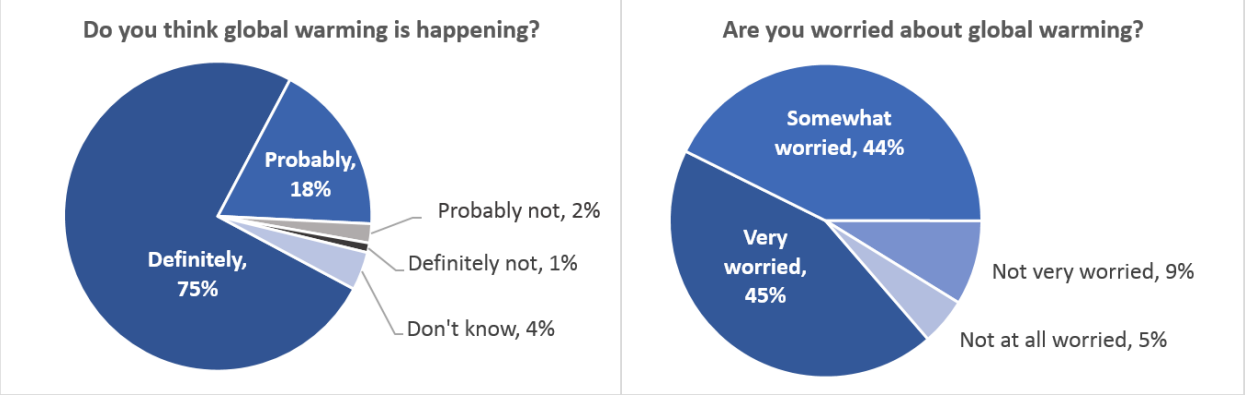
The Yale Office of Sustainability conducted the transportation survey for the first time in 2015, as it was conducted by a separate office in previous years. The results of the survey will inform goals and activities of the Office of Sustainability. Future transportation surveys may include more questions about sustainability in general or specific topics. Using the survey as an opportunity to assess the Yale community's perceptions of global warming, two new questions were added in 2015:

- Do you think global warming is happening?
- Are you worried about global warming?[18]

[18] These questions come from surveys conducted by the Yale Project on Climate Change Communication. See http://environment.yale.edu/climate-communication.

Charts 15 and 16 below illustrate the results from these questions for all respondents. A 2015 survey conducted by the Yale Project on Climate Change Communication revealed that 63% of Americans 18 and older think that global warming is happening, and 59% of those are either "extremely sure" or "very sure" that global warming is happening.[19] The Yale community's belief that global warming is happening is higher than the national average – 93% believe that global warming is at least "probably" happening, and 75% believe it is definitely happening.

The percentage of the Yale community that is worried about global warming presents a similar trend. 45% of the Yale community is "very worried" about global warming, compared to the national average of 11%. Forty-four percent of the Yale community is "somewhat worried" about global warming, closer to the national rate of 41%.



Charts 15 and 16: Global Warming Perceptions for Total Population

Belief in and worry about global warming is slightly higher among Yale graduate students than employees, as shown in Charts 17 and 18 below.

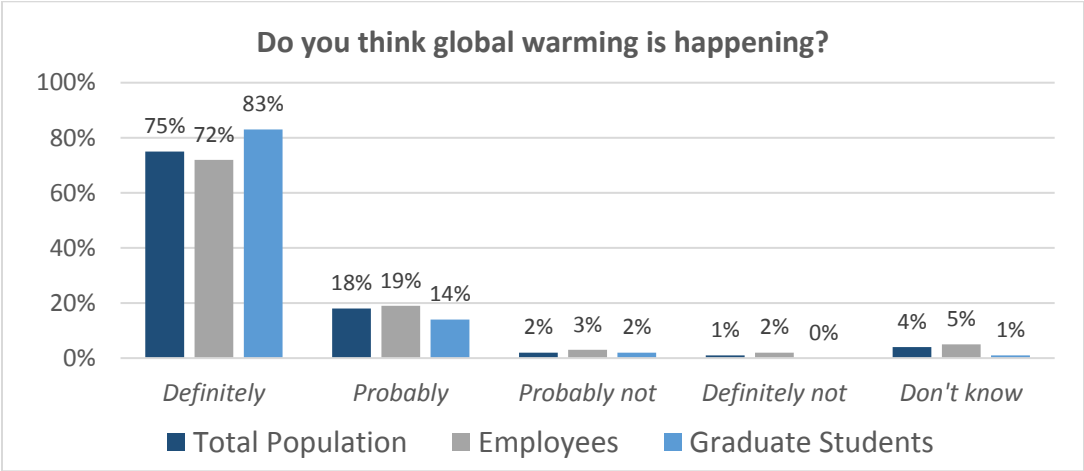


Chart 17: Percent of Respondents Who Think Global Warming is Happening

[19] See http://environment.yale.edu/climate-communication/files/Global-Warming-CCAM-March-2015.pdf.

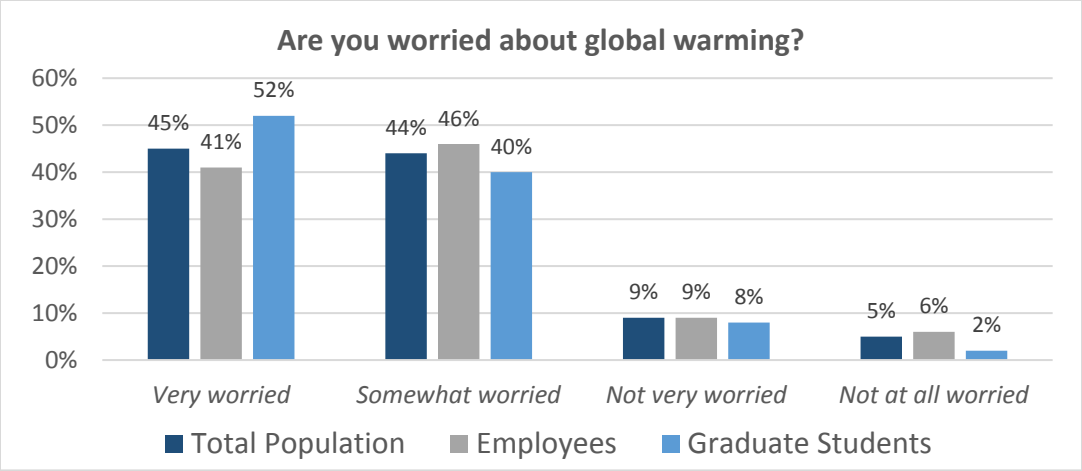


Chart 18: Percent of Respondents Worried about Global Warming

Conclusion

The results of the 2015 Transportation Survey will have a significant impact on Yale's future sustainable transportation projects and programs. As described in the report, the University has experienced a slight increase in the number of commuters driving alone to campus since 2013. The Office of Sustainability and its campus and community partners hope to reverse this trend by using the data contained in this report to inform goals and strategies to increase alternative transportation use in the Yale community.

For more information on sustainable commuting at Yale, please visit to.yale.edu.

This report serves as a correction to the version issued in January 2016. The previous version featured data for 2015 "drive alone" and "transit" modes from a mode split calculation methodology inconsistent with the methodology used in previous survey reporting processes. This report has been updated to reflect accurate trend data for all survey years (2007-2015).