

Yale 2012 Sustainable Transportation Survey Summary Report

In 2007, Yale University established a baseline mode split for the entire commuting population. At the time Yale's total population was 19,914; 13,771 or 69.8% represented employees, and 6,143 or 30.8% represented graduate students. The overall drive alone rate was 44%. Five years later in 2012, Yale's total population was 19,420; 12,980 or 66.8% employees and 6,440 or 33.2% graduate students. Over time, Yale's total population has only increased by 2.5%; however the drive-alone rate for employees and graduate students decreased to 38% in 2012. In fact, there has been a 6% decrease in the drive-alone rate over the 5 years. What the surveys have shown over time is that Yale has achieved a significant reduction in the drive-alone rate in the face of a relatively stable population. Therefore to make additional gains in reducing car-related greenhouse gases, Yale will need to consider additional incentives that would encourage employees to switch from driving alone to alternative modes.

Highlights of the 2012 Survey Results

In November of 2012, for the sixth consecutive survey, Yale Faculty, Staff, Postdocs, and Graduate/Professional Students were surveyed to track their commute behavior over time. Working with a similar population for both years, a representative sample of 997 was taken again in 2012. Table 1 below indicates the changes in population from 2011 to 2012.

University Affiliation	Total	Total	% of	% of	Number	Number
	population 2012	population 2011	Total 2012	Total 2011	2012	2011
Faculty	3,406	3,305	18%	17%	175	173
Postdoc	1,082	1,136	6%	6%	55	59
Clerical Tech	3,548	3,419	18%	18%	182	179
Manage Prof	3,951	3,987	20%	21%	203	208
Service Main	993	945	5%	5%	51	49
Graduate Student	6,440	6,228	33%	33%	331	329
	19,420	19,080	100%	100%	997	997

Table 1

In 2012 there were only very slight 1-2% changes to the employee categories as a percentage of the survey sample group. Since 2011, the overall total population only increased by 1.75% or 340 respondents. The significance of a relatively stable population is that there is little effect on one-way trips to campus and thus car-related greenhouse gas emissions also remained rather stable.

Employee vs. Graduate Student Commute Modes 2012

As shown in Table 2 below, there is a 49% difference in the rate of employees versus graduate students driving alone. There is also a large difference between the biking and walking rates because graduate students typically live in closer proximity to campus. It is also interesting to note that there is only a slight 2% difference in transit use by graduate students versus employees.

2012	Employees	Graduate Students
Drive Alone	54%	5%
Transit	22%	24%
Rideshare	8%	3%
Bicycle	5%	18%
Walk	11%	48%
Telecommute	1%	1%

Table 2

One of the goals of providing more sustainable transportation options on the Yale campus is to reduce car-related greenhouse gas emissions. Therefore, the more relevant target audience is Yale employees as they comprise 67% of the total population. The total sample (997) referenced in Table 1, was reduced

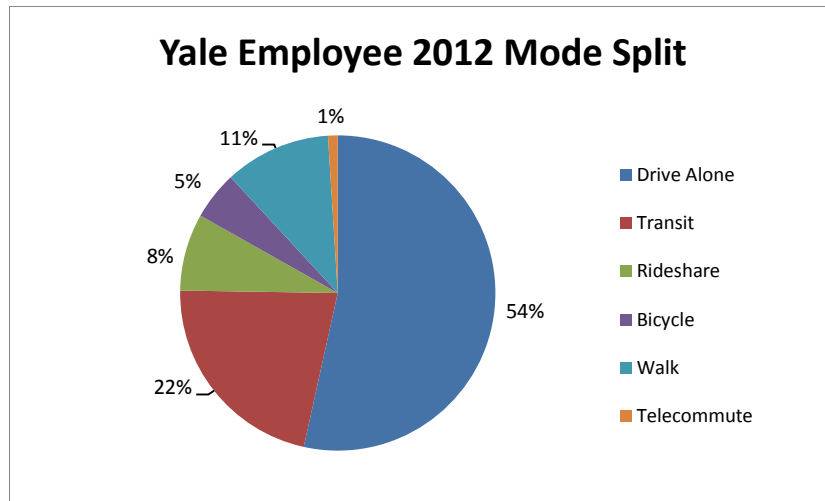
to 666—representing employee responses—in all charts and references below unless otherwise indicated.

How Yale Employees Commuted to Campus in 2012 vs. 2011

Table 3 below shows the 2011 mode split in with comparison to 2012 mode split. Graph 1 illustrates the mode breakdown for Yale employees in 2012.

	2012	2011
Drive Alone	54%	52%
Transit	22%	25%
Rideshare	8%	8%
Bicycle	5%	4%
Walk	11%	9%
Telecommute	1%	1%

Table 3

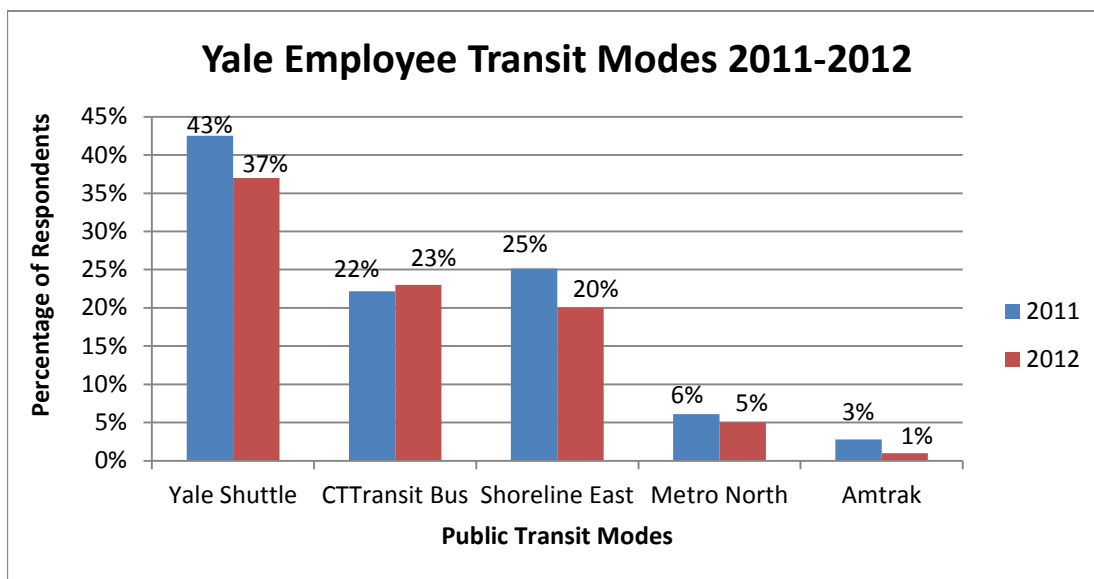


Graph 1

Driving alone increased by 2%, public transit use decreased by 3%, ridesharing remained the same, bicycling increased slightly by 1%, and walking increased by 2% since 2011. Teleworking remained a small share of the mode split again in 2012 at 1%; we do not expect to see an uptick in this alternative work option until an official Yale policy is announced and implemented.

Public Transit Mode Comparison

The Yale Shuttle has remained the most frequently used mode of transit over the past year with 37% of employees choosing the free Shuttle over other modes of public transit. Graph 2 below indicates the 2012 transit mode breakdown as it compares to 2011.



Graph 2

It is important to note in Graph 2 above, that use of all modes of public transit (besides CTTTransit) dropped since 2011, which is consistent with the overall 3% drop in transit as part of the Yale employee mode share in 2012. Use of the Yale Shuttle among transit riders fell by the largest margin of 6%, Shoreline East dropped 5%, followed by Amtrak with a 2% drop, and lastly ridership on Metro North fell

only by 1%. CTTTransit was the only transit mode that saw a small increase of 1% in use by transit riders in 2012.

In addition 8.08% of all employees (or 1,049) rode the Yale Shuttle as their primary mode of transportation, down by almost 60 employees since 2011.

Why Yale Employees Chose Their Commute Mode Comparison

A new question on last year’s transportation survey was introduced in order to better understand what motivates people to commute to campus by their chosen mode. Results from the 2012 survey show that employees’ reasons for choosing their commute remained consistent within the top three (3) choices; with “environmental reasons” ascending to the top spot with 18% of employees claiming this factor influenced their commute choice.

Table 4

Why Chose Commute	2012	2011
For environmental reasons	18.02%	17.37%
For health and exercise	17.27%	16.17%
Other	16.22%	19.46%
I live within walking distance of a transit stop	14.56%	13.32%
I save money using pre-tax salary for my train or bus pass	6.76%	7.34%
I carpool and get a discount on my parking permit	2.70%	3.74%

Table 4 above highlights that consideration for “environmental reasons,” “health and exercise,” and living within walking distance of a transit stop have increased in importance for employee mode choice since 2011. The high ranking of environmental and health and exercise reasons could be an indication that Yale employees are concerned about such issues and would be open to other options like a bike sharing system to supplement or alter their commute mode choice in the future.

While at the same time, saving money using pre-tax salary for transit passes and getting a discount on a parking permit for carpooling have both fallen in popularity since last year’s survey. The lower consideration given to these incentives may indicate that subsidies to use transit or carpool are not great enough to motivate employees to change their commute mode.

Incentives to Stop Driving Alone to Campus

The top four incentives in the 2012 survey that could motivate employees to switch from driving alone to alternatives are as follows:

#1) MONTHLY CASH ALLOWANCE IN EXCHANGE FOR PARKING SPACE: 15.24% of Yale employees who drive alone to campus indicated on average they would likely¹ change their mode of transportation if they could receive a monthly cash allowance in exchange for their parking space. Interest in this incentive has increased by 1.76% since 2011. Using a rule of thumb for actual behavior change², that only 10% of those who answer a “what if” choice question would actually consider switching modes, could mean a potential of 107 employees would likely change.

Yale Employees AVG Interest in Monthly Cash Allowance 2009-2012			
2009	2010	2011	2012
14.56%	9.95%	13.48%	15.24%

Table 5

Yale employees have consistently chosen a monthly cash allowance in exchange for their parking space as the top incentive that would change their commute mode for the past several years.

¹“Likely” is the average of “very likely” and “somewhat likely” answers.

²(Note: the actual change number is based on the 2012 drive alone rate of 54% of all employees or 7,009 employees. Of the employees who drive alone, 15.24% say they would likely change or 1,068 employees. Recognizing the probability that 10% of the 1,068 would likely change, approximately 107 employees might actually switch from driving alone to using alternative modes).

#2) FLEXIBLE HOURS: almost 15% of Yale employees who drive alone to campus indicated on average that they would likely change their mode choice if they had flexible hours to accommodate transit, carpool or vanpool schedules, compared to 11.61% in 2011. Potentially 103 employees would likely convert from driving alone to using alternative modes.

Yale Employees AVG Interest in Flexible Hours 2009-2012			
2009	2010	2011	2012
13.64%	9.65%	11.61%	14.64%

Table 6

#3) USE OF CTTTRANSIT BUSES FOR FREE: This incentive has moved up to the third position with 11.86% of Yale employees on average indicating that they would likely change their commute mode if they were allowed to use CTTransit buses for free to commute to campus, over a 2% increase in employee interest since 2011. Potentially 83 employees would likely convert from driving alone to using alternative modes.

Yale Employees AVG Interest in Free CTTransit 2009-2012			
2009	2010	2011	2012
10.67%	7.66%	9.66%	11.86%

Table 7

#4) \$47³ DISCOUNT ON MONTHLY TRAIN/BUS PASS: 11.5% of Yale employees who drive alone to campus indicated that they would likely change their commute mode if they were given a \$47 discount on their monthly train or bus pass, compared to 10% of employees in 2011. Potentially 81 employees would likely switch from driving alone to using the bus or train. Table 6 below shows the survey results over time of employees likely to switch to alternative modes if they are provided a \$45/47 discount on their transit pass.

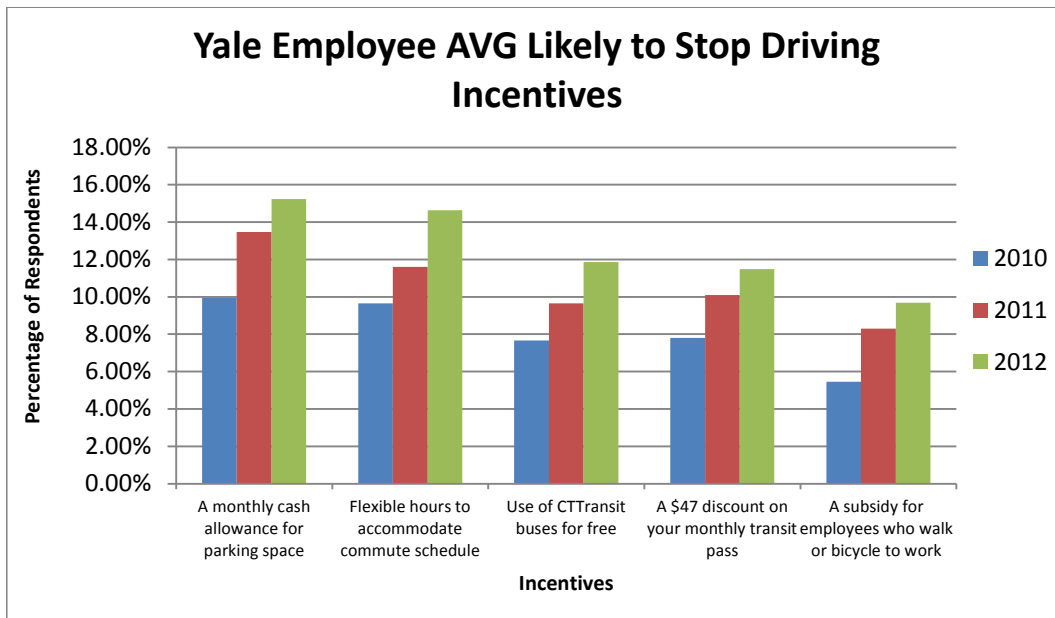
Yale Employees AVG Interest in discounted Monthly Transit Pass 2009-2012			
2009	2010	2011	2012
11.74%	7.81%	10.11%	11.49%

Table 8

Yale employees continue to express their interest in a monthly cash allowance for their parking space, more flexible hours, and subsidies for bus or transit passes as the incentives that would encourage them to stop driving alone.

The most important difference is that in 2012 a higher percentage of employees selected these same incentives compared to 2011 (see graph 3 below); this continues a trend from 2010 of employees being more enthusiastic about potential incentives to stop driving alone. In particular, the largest gain in interest among these incentives was seen in “flexible hours” and “use of CTTransit buses for free” with 3% and 2% increases respectively since 2011.

³ The potential discount on monthly train/bus pass was increased on the 2012 survey from \$45 to \$47.



Graph 3

The increase in driving alone and decrease in transit use by employees as seen in this year’s mode split may be an indication that Yale needs to do more to motivate its commuters to choose alternative commute options. Over the last few survey years, employees’ opinions regarding incentives to switch from driving alone to transit have become more prominent as seen in the charts and graphs above. Offering a transit subsidy to employees to use CTTtransit, Metro North, Amtrak, or the Shoreline East train could significantly decrease the drive alone rate in the future.

Reasons for Driving Alone

Tables 9 and 10 below show the top five reasons for why employees drive alone have remained consistent over time. The same reasons have been ranked 1st, 2nd and 3rd respectively from 2009 through 2012.

What are your reasons for driving alone?	Num.	2012
Hours on campus are irregular	178	1
Need car for errands or appointments	150	2
Driving alone takes less time	147	3
Transit does not work with my schedule	122	4
Need car in case of emergencies	115	5

Table 9

What are your reasons for driving alone?	Num.	2011
Hours on campus are irregular	187	1
Need car for errands or appointments	153	2
Driving alone takes less time	151	3
Transit does not work with my schedule	112	4
Need car in case of emergencies	110	5

Table 10

The only change from 2011 to 2012 is the first three reasons were chosen with less frequency, and the 4th and 5th reasons increased in number by 10 and 5 respectively.

Employee Top 10 Towns & Zip Codes

According to the data from the top 10 towns and zip codes from the 2012 survey, over a third of Yale employees live in New Haven zip code 06511 with the surrounding towns of Hamden and Branford rounding out the top three in 2012.

Towns 2012	Number	Percent ⁴	Zip Codes
New Haven	159	24%	06511
Hamden	88	13%	06517, 06518, 06514
Branford	41	6%	06405
Guilford	32	5%	06437
North Haven	30	5%	06473
West Haven	30	5%	06516
East Haven	28	4%	06512
Woodbridge	20	3%	06525

Table 11

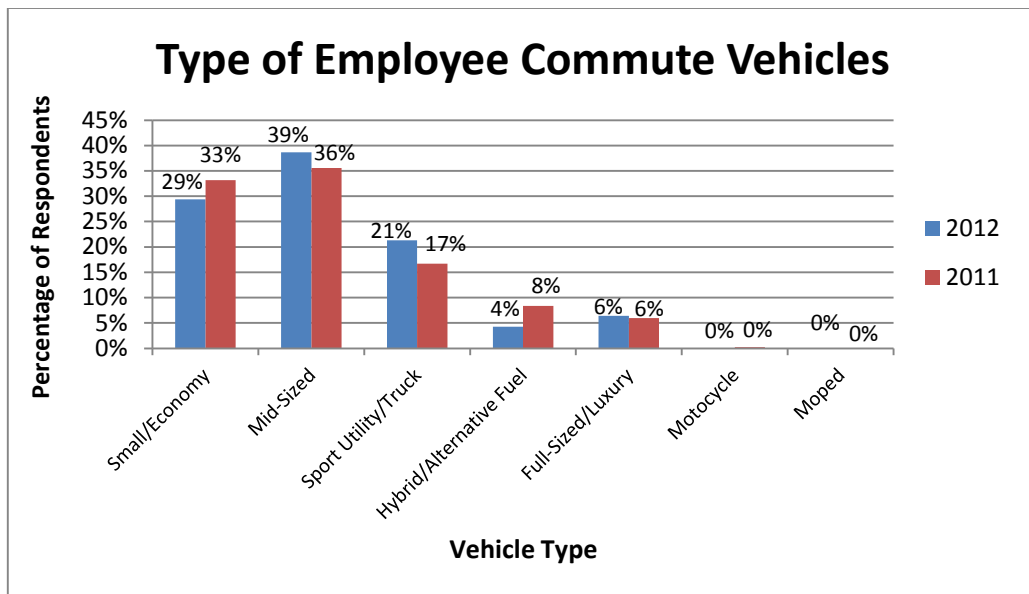
Towns 2011	Number	Percent ⁵	Zip Codes
New Haven	185	28%	06511, 06515
Hamden	82	12%	06517, 06518, 06514
Branford	43	6%	06405
Guilford	41	6%	06437
West Haven	34	5%	06516
East Haven	24	6%	06512
Woodbridge	19	4%	06525

Table 12

The only change in geographic location of Yale employees is the inclusion of North Haven in the top 10 towns in 2012. It is also important to note that the 06515 zip code in New Haven has dropped off the top 10 list on this year's survey.

Employee Vehicle Type

Graph 4 below shows several unfavorable developments since 2011 concerning employee vehicle type: 1) ownership of Small/Economy vehicles decreased by 4% while Mid-sized increased by 3%, 2) ownership of "Hybrid/Alternative Fuel" vehicles decreased by approximately 4%, and 3) use of "Sport Utility or Truck" increased by almost 5% since 2011.



Graph 4

⁴ Percentage calculated out of the employee sample (666) from the 2012 survey.

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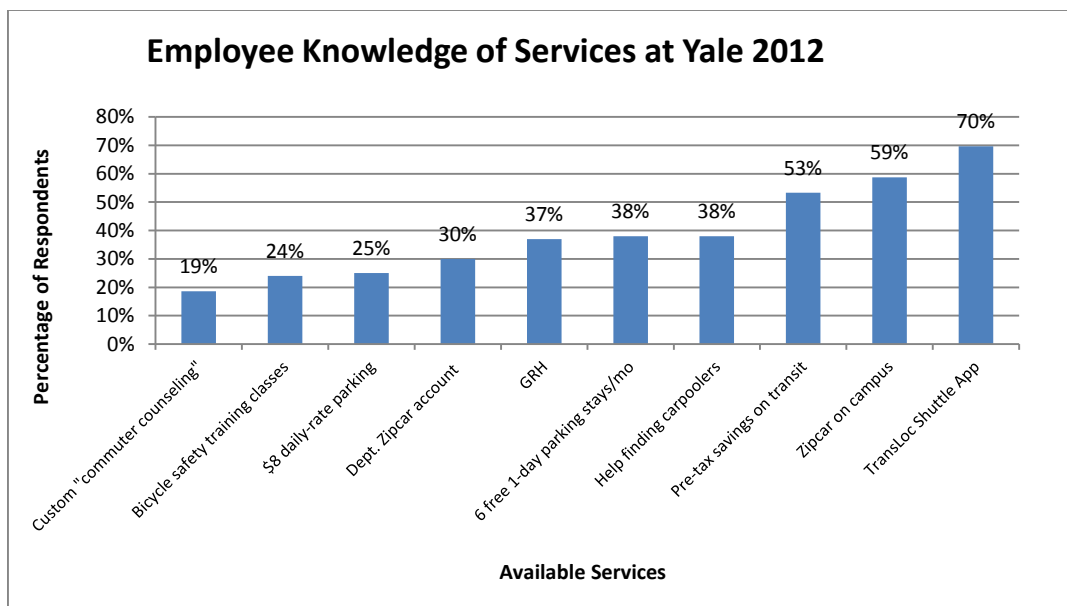
With the decrease of “Hybrid/Alternative Fuel” cars coming to campus, Yale may want to investigate supporting infrastructure such as charging stations for electric vehicles in a select parking facility on campus. Other universities have been successful in such an enterprise.

Greenhouse Gas Emission Reduction from Sustainable Transportation

Employee use of transportation modes that cause no CO₂ emissions (walking, biking and teleworking) has increased from 13% in 2007 to 17% in 2012. The increased use of walking and biking to campus is by far the largest contributor to greenhouse gas reductions within the context of utilizing sustainable transportation at Yale. To achieve greater greenhouse gas reductions it will take additional incentives to motivate employees to shift to non-emission modes.

Commuter Familiarity with Yale Transportation Services

In the last several transportation surveys commuters at Yale that drive-alone at least one day per week were asked if they knew that Yale offered certain services to commuters. In the 2012 survey, all commuters regardless of mode were asked if they knew that Yale offered a variety of commuter services. The question was asked to get a more complete picture of how well the University is marketing commuter services to its employees.



Graph 5

According to Graph 5 above Yale employees are very familiar with the TransLoc shuttle app, and a majority also knows about the availability of Zipcars on campus and receiving pre-tax savings on their transit or bus pass. However, less than half of the employees surveyed have knowledge of the other seven commuter services offered at Yale including custom commuter counseling and departmental Zipcar accounts.

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.

Summary

The following are a few highlighted facts from the 2012 survey review:

- The most notable changes in the 2012 employee mode split were seen in the drive-alone rate increasing from 52% to 54% and the use of transit dropping by 3% since 2011.

- Almost every mode of public transit saw a decrease in use by transit riders since 2011, with ridership on the Yale Shuttle falling by the largest margin of 6%. CTTransit was the only transit mode that saw a small increase 1% in use by transit riders in 2012.
- Employee use of transportation modes that cause no CO₂ emissions (walking, biking and telecommuting) has increased from 14% in 2011 to 17% in 2012, with walking and bicycling increasing by 2% and 1% respectively. The percentage of employees telecommuting remained constant since 2011 at 1%.
- The top three incentives that would encourage employees to use alternative modes this year are:
 - A monthly cash allowance in exchange for parking space
 - Flexible hours
 - Use of CTTransit buses for free

The largest gain in interest among these incentives was seen in “flexible hours” and “use of CTTransit buses for free” with 3% and 2% increases respectively since 2011.

- Employee survey respondents again chose the same top three reasons for driving alone in 2012:
 - Hours on campus are irregular
 - Need car for errands or appointments
 - Driving alone takes less time
- Yale employees chose “environmental reasons,” and “health and exercise,” as the top two reasons for choosing their commute mode in 2012. While living within walking distance of a transit stop has also increased in importance for employee mode consideration since 2011.
- According to the 2012 survey results, Yale employees are very familiar with the TransLoc shuttle app (70%), almost 60% also know about the availability of Zipcars on campus, and 53% are familiar with the option to receive pre-tax savings on their transit pass. Less than half of the employees surveyed have knowledge of the other seven commuter services offered at Yale. The results point to a need for additional marketing of existing commuter services to Yale employees.

Yale began surveying its commuting population in 2007, since then the drive-alone rate has dropped by 6% overall and 4% for commuting employees. By reducing drive alone trips, Yale is simultaneously contributing to the reduction of greenhouse gas emissions on campus and in the surrounding area. Looking towards future sustainability planning, when Yale sets a new goal for reducing greenhouse gas emissions it should consider implementing additional incentives to motivate commuters to get out of their cars. For example:

The largest percentage of Yale employees have consistently chosen a monthly cash allowance in exchange for their parking space as their preferred incentive to stop driving alone.

Parking cost and location are always a major consideration for commuters who drive alone to work; therefore changes in parking fee structure, reduction in overall parking spaces, or a monthly cash allowance may be enough to further reduce the drive-alone rate.

Commuter interest in free CTTransit passes increased by 2% since 2011, therefore it may be worthwhile to investigate the feasibility of a subsidy for CTTransit.

An official telecommute policy would provide employees with an additional non-emission mode option at Yale.

Without additional incentives, Yale’s drive-alone rate and greenhouse gas emissions are likely to only fluctuate with changes in its population rather than from actual mode shift.