

## Yale Sustainable Transportation Survey 2007 -2009 Comparison

### Highlights of the Results

In November of 2009, for the third consecutive year, Yale Faculty, Staff, Postdocs, and Graduate/Professional Students were surveyed to track their commute behavior over time. The total population in 2009 was 18,756 which represented a 6 percent decrease since 2007 when the total population was 19,914. Although the reduction was significant in overall numbers, it was not enough to change the category from which a representative sample of 997 was taken. The sample breakdown compared to 2007 is as follows:

University Affiliation	Total population 2009	Total population 2007	% of Total 2009	% of Total 2007	Number 2009	Number 2007
Faculty	3,045	(3,436)	17%	(17%)	165	(172)
Postdoc	1,027	(1,556)	5%	(8%)	54	(78)
Clerical Tech	3,365	(3,441)	18%	(17%)	178	(172)
Manag Prof	4,040	(4,157)	21%	(21%)	214	(208)
Service Main	940	(1,181)	5%	(6%)	49	(59)
Graduate Student	<u>6,339</u>	<u>(6,143)</u>	34%	<u>(31%)</u>	337	<u>(308)</u>
	18,756	(19,914)	100%	(100%)	997	(997)

The 2007 survey established baseline data for the entire commuting population and the comparison chart above indicates the changes in population from 2007 to 2009. As the graduate/professional student population increased and the employee population decreased as a percentage of the survey sample group, one-way trips to campus decreased by 1,354 trips per day. This resulted in a reduction in car-related greenhouse gas emissions.

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's faculty and staff because although they comprise 66% of the total population, they represent approximately 92% of the population parking in Yale's parking facilities. Because of this, the following survey results have been sorted to exclude graduate students. The total number of responses referenced from the chart above (997) was reduced to 656—representing employee responses only—in all charts and references below.

### How Yale faculty and Staff Commuted to Campus in 2009 vs 2007

The most exciting results of the 2009 transportation survey compared to the 2007 baseline, was the indication of a positive change in the commuting habits of Yale's faculty and staff over a three year period. As shown in the graph below, driving alone dropped by 6% from 2007 to 2009, public transit use increased by 3%, sharing the ride increased 1%, bicycling increased 2%; walking remained stable and telecommuting slipped to 2%. The reduction in telecommuting from 2007 to 2009 could be partially explained by the reduction in overall numbers, particularly faculty, post-docs, and managerial professional employees as they are the most likely candidates to telecommute.

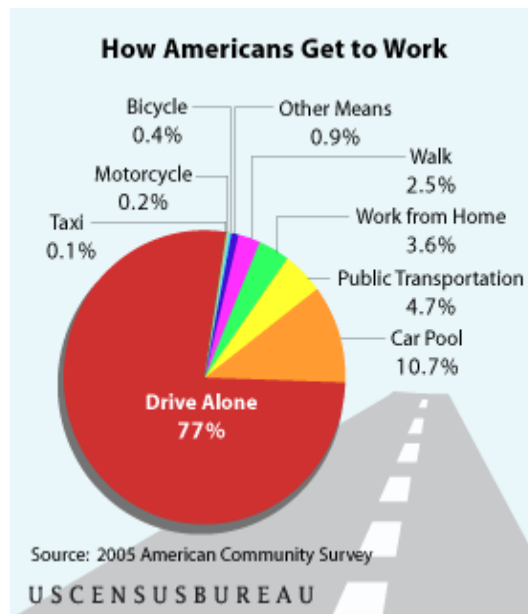
The reduction in overall employee numbers in relationship to an increase in student numbers over time could have had an effect on the drive-alone, or Single Occupant Vehicle (SOV) rate precipitating the SOV decline from 58% in 2007 to 53% in 2009. During the same time period, use of other transportation modes increased, supporting the switch from driving alone to alternatives.

The table below shows the baseline 2007 mode split in comparison to 2009 mode split.

	2007	2009
Drive Alone	44%	39%
Transit	19%	22%
Rideshare	6%	5%
Bicycle	5%	8%
Walk	23%	23%
Telecommute*	3%	2%

\*In 2007, "Telecommute" was grouped with "Other." In subsequent years, it had it's own category

When Yale employees' commuter transportation modes for the past three year period is compared to National averages, Yale's transportation mix compares favorably, as evidenced by the chart below. It is important to note that Yale is located in a small city with limited public transit as is the case with many cities across the US so such a comparison is not too far off in representation.



### Yale Shuttles

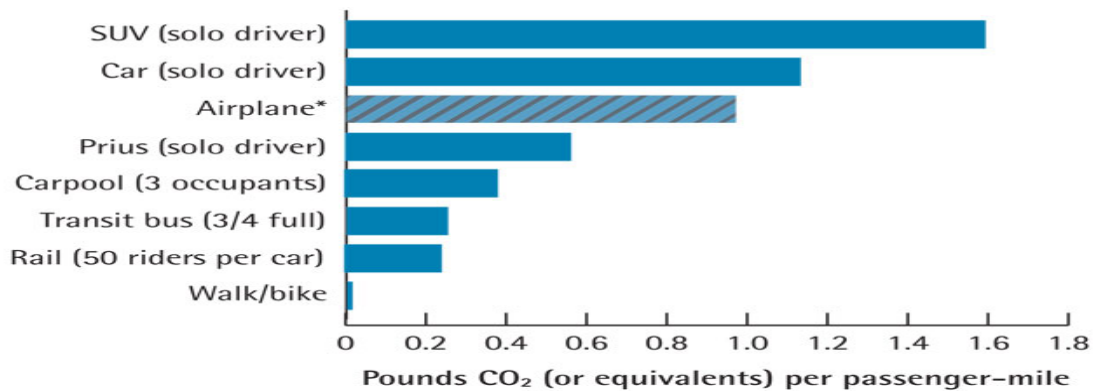
The Yale Shuttle has remained the most frequently used mode of transit among Yale faculty and staff over the past three years. 8.4% or 1,430 of all employees in 2009 used the Yale Shuttle as their primary mode of transportation. In 2007, 7.2% or 992 used the

Yale Shuttle as their primary commute mode, indicating a continuing strong willingness of employees to use the Shuttle to get to and from campus. The increase is significant especially taking into consideration the decrease in employee numbers over the same time period.

**Greenhouse Gas Emission Reduction From Sustainable Transportation**

In order to further reduce Yale’s greenhouse gas emissions caused by transportation, it is critical that more of Yale’s commuting population shift from driving alone to transit, carpooling, bicycling, and walking.

Below is a chart representing the various transportation modes compared by fuel efficiency. For every 100 people who carpool, the university could reduce its carbon footprint by 13,200 pounds of CO<sub>2</sub> per year. For every 100 people who use transit, CO<sub>2</sub> emissions could be reduced by between 8,400 and 20,160 per year. The following chart shows the relative CO<sub>2</sub> emissions from various transportation modes for 2009.



*\*Aircraft emissions are the most variable. Use an online calculator, such as Atmosfair.com, to estimate the climate impacts of your flight.*



Employee use of transportation modes that cause no CO<sub>2</sub> emissions (walking, biking and telecommuting) has remained a steady 15% from 2007 to 2009. It will take additional employee incentives to motivate more than 15% to switch to non emission modes. Below are some of the results of what employees would consider as incentives that might shift more of faculty and staff who drive alone to work into less polluting modes of transportation.

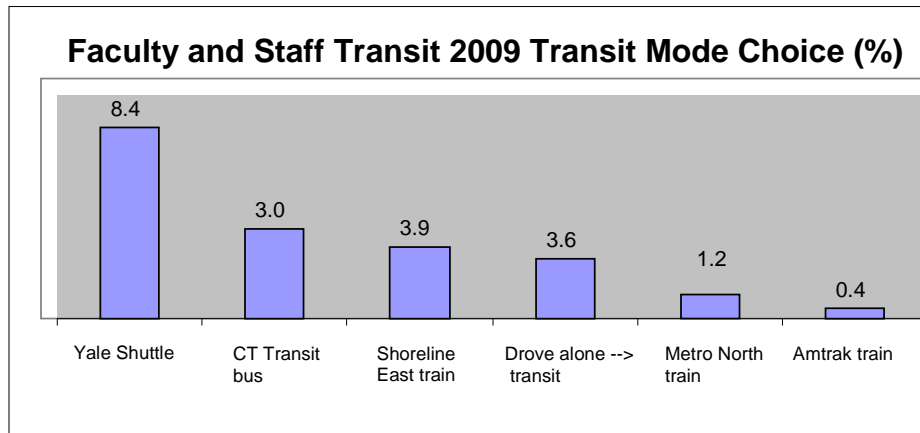
**Use of Alternatives to Driving Alone**

The most frequently selected alternative choice for changing commutes from driving to alternatives were as follows:

**TRANSIT SUBSIDY:** 11.7 percent of faculty and staff (1,452 individuals) who drive alone to campus indicated that they would likely change their mode of transportation if there were a \$45 discount on a monthly transit pass. Using the rule of thumb for actual change, that only 10% of those who answer a “what if” choice question would change, could mean a potential of 145 employees converting from driving alone to using the bus or train.

**FREE USE OF CTTTRANSIT: 10.7 percent of faculty and staff (1,329 individuals) who drive alone to campus would likely change their mode of transportation if they could use CTTtransit buses for free. Using the rule of thumb for actual change, that only 10% of those who answer a “what if” choice question would change, could mean a potential of 133 employees converting from driving alone to CTTtransit.**

Below is the chart indicating the current transit mode breakdown.



### Reasons for Driving Alone

The top 5 ranked reasons for driving alone were interesting to compare over time. The reasons don't change much but there are a couple of notable differences from 2007 to 2009. In the ranked choices below, “Irregular Hours” ranked number 1 over time; “Need car for errands” ranks 2<sup>nd</sup>, and 3<sup>rd</sup> respectively. In 2009, “Driving alone takes less time”, jumped to 3<sup>rd</sup> rank. It didn't even make the top 5 in 2007 or 2008.

What are your reasons for driving alone?	Num.	2009
Hours on campus are irregular	184	1
Need car for errands or appointments	154	2
Driving alone takes less time	136	3
Need car in case of emergencies	100	4
Too far to travel by bicycle	91	5

What are your reasons for driving alone?	Num.	2007
Enjoy my privacy, prefer to drive alone	104	1
Hours on campus are irregular	66	2
Too far to travel by bicycle	64	3
Need car for errands or appointments	54	4
Difficult finding others to carpool with	48	5

To get a better picture of why the new prominence of “driving alone take less time”, the Town and Zip code results in the charts below may provide some explanation. According to the survey results, on average, 30% of Yale's employees live in New Haven. One could assume it is easier just to drive based on employee written reasons for driving alone such

as: long wait for a bus, bus not on time, schedules don't work, etc.; train frequency and connections can be inconvenient, and few people are willing to bike or carpool for the reasons listed above.

Towns 2009	Number	Percent	Zip codes
New Haven	196	29.88%	06511, 06515, 06513
Hamden	85	12.96%	06517, 06518, 06514
Branford	33	5.03%	06405
North Haven	33	5.03%	06473

Towns 2007	Number	Percent	Zip codes
New Haven	222	32.41%	06511, 06515, 06513
Hamden	88	12.85%	06517, 06518, 06514
Branford	45	6.57%	06405
East Haven	33	4.82%	06512

According to the response to the question "If you carpooled, why did you stop?" 62 respondents or 9% of employees who currently drive USED to carpool, and 42 respondents or 6% of employees USED to bicycle. Reviewing their reasons would help with tailoring the marketing of these two alternative modes to people living close by. In fact, more than a quarter of all employees (27%) live 3 miles or less from campus.

3 miles	10.37%
4 miles	9.45%
2 miles	7.16%

For those employees who do drive (currently a little more than half of Yale employees), fuel efficiency has declined slightly, from an average of 25.1 mpg in 2007 to 24.8 in 2009.

### Summary

As the ratio of students to employees increases, a concurrent decrease in the percentage of drive alone trips occurs. This is because employees tend to drive alone more than students. Therefore, in order to gain further reductions in drive-alone commuting, the faculty and staff—who comprise 66% of the survey population, but 92% of the parking population—must be the focus of trip reduction incentive programs. Yale's drive-alone rate still compares favorably to the national average, but not well compared to its peers at comparable institutions.

The following are a few facts from the three year survey review:

- Employee use of transportation modes that cause no CO<sub>2</sub> emissions (walking, biking and telecommuting) has remained a steady 15% from 2007 to 2009. It will take additional employee incentives to motivate more than 15% to switch to non-emission modes.
- Over the past three years the Yale Shuttle has remained the most frequently used mode of transit among Yale faculty and staff.
- The top two incentives that would encourage employees to use transit are:
  - a \$45 subsidy toward the cost of a monthly transit pass
  - free use of CTTransit.
- The monthly CTTransit bus pass costs \$45, so that amount given to employees who use transit every month would accomplish both free CTTransit AND all other transit subsidized up to \$45.
- Employee survey respondents consistently list their primary reason for driving alone as:
  - “hours on campus are irregular, ” followed by
  - “need car for errands or appointments” and
  - “need car in case of emergencies.”
- The University has solutions in place for these arguments against sustainable commute modes, such as flexible scheduling, Zipcar, and a Guaranteed Ride Home Program, and will be better communicating these through the university media outlets, a poster campaign, Facebook posts, and Twitter site.