



Getting to Sustainability

***Measuring Commuter
Emissions
on Your Campus***



PARKING AND
TRANSPORTATION

UNIVERSITY of CALIFORNIA • IRVINE

WHY?

- **Concern re: mobile sources of GHG**
- **California Assembly Bill 32**
- **American College & University Presidents' Climate Commitment**





SOURCES OF DATA

- Permit Sales
- Lot Utilization
- Cordon Counts
- AQMD Surveys (some institutions)
- Other Surveys

Do not allow you to measure emissions.

Need:

- VMT*

HOW TO PROCEED?

□ Measure CO₂ emissions:

1. Find VMT
2. Use *average MPG* of cars/SUVs
3. From there you can calculate:
 - *Gallons* used
 - Tons CO₂ produced
 - Tons *GHG* emissions



FINDING VMT

- ❑ **Requires knowing Mode & Distance.**

- ❑ **Possible sources of data**
 - *Payroll*
 - *Surveys*

***AVERAGE* MPG**

- ❑ **Federal Highway Administration charts www.fhwa.dot.gov/search.html (annual MV-1 charts)**
 - **Provides national or state MPG data**
 - **Provides ratios of cars/SUVs**



CONDUCTING THE SURVEY

1. Choose 1 average day (full census or random sample).

Ask:

- *Status* (employee, student, or visitor)
- *Distance* (1-Way)
- *Mode*

___Employee ___Student ___Visitor

1-Way Miles: _____

<i>Commute Mode</i>	Check One
Drive Alone	
Motorcycle	
2-person Carpool	
3-person Carpool	
4-person Carpool	
5-person Vanpool	
6-person Vanpool	
7-person Vanpool	
8-person Vanpool	
9-person Vanpool	
10-person Vanpool	
11-person Vanpool	
12-person Vanpool	
Shuttle	
Bus	
Rail	
Walk	
Bike	
Telecommute	
Not Working That Day	

[Sample Survey]

2. Tabulate Results

- Tabulate employees, students, & visitors separately

[*Sample*

Tabulation Sheet]

<i>EMPLOYEE</i>	TOTAL	AVG DISTANCE: (1-Way = Home to Campus)
Drive Alone		
Motorcycle		
2-person Carpool		
3-person Carpool		
4-person Carpool		
5-person Vanpool		
6-person Vanpool		
7-person Vanpool		
8-person Vanpool		
9-person Vanpool		
10-person Vanpool		
11-person Vanpool		
12-person Vanpool		
Shuttle		
Bus		
Rail		
Walk		
Bike		
Telecommute		
Not Working That Day		



CALCULATING EMISSIONS

- Calculate Employees, Students, Visitors *separately*
- Use VMT only from *contributing* Modes (“Bike”, “Walk”, “Not working” excluded)
- If random sample, be sure to multiply by factor for total population

OTHER CALCULATORS

- ❑ **Clean Air, Cool Planet – Campus Carbon Calculator**
 - **Covers stationary & mobile sources;**
 - **Issues:**
 - **does not account for exact # in mode**
 - **does not allow for vanpool**
 - **averages car/SUV MPG together**
 - **does not provide MPG data beyond 2004**



FUTURE CONSIDERATIONS

Evaporative Vehicular Emissions

Intra-campus VMT

RESOURCES

- California Assembly Bill 32 -
<http://www.arb.ca.gov/cc/docs/ab32text.pdf>
- American College & University Presidents' Climate Commitment -
<http://www.presidentsclimatecommitment.org/>
- CO₂ calculations: US Environmental Protection Agency –
<http://www.epa.gov/oms/climate/420f05001.htm>
[#calculating & http://www.epa.gov/otaq/climate/420f05004.htm](http://www.epa.gov/otaq/climate/420f05004.htm)

RESOURCES - Continued

- MPG & Car/SUV ratios - Federal Highway Administration
www.fhwa.dot.gov/search.html (yearly MV-1 charts); US DOT, RITA www.rita.dot.gov/BTS Table 4-23 & Table 1-11]
- South Coast Air Quality Management District -<http://www.aqmd.gov>
- Clean Air, Cool Planet –
<http://www.cleanair-coolplanet.org/toolkit/inv-calculator.php>