



Sassafras Solutions

11 Sassafras Court
Boronia Vic 3155
Email: s-wills@bigpond.net.au
Phone 9762 5870
Mobile 0417 548 732

ABN: 4244 760 7579

Sassafras Solutions Report for Bicycle Victoria

Greenhouse gas calculations for National Ride to Work Day 2007

December 2007

Table of contents:

1. Overview.....	2
2. Basis for calculations	2
2.1. Definitions.....	2
2.2. Constants	3
2.3. Assumptions	3
2.4. Calculations.....	4
3. Results.....	6
4. Conclusion.....	7

Disclaimer

This report may contain confidential information. It has been compiled by Sassafras Solutions on behalf of Bicycle Victoria

This report is compiled based on information and data provided by Bicycle Victoria and others. As such it relies on the accuracy of the provided material. While some checks have been undertaken to check data, the information provided was assumed to be correct. Accordingly Sassafras Solutions will not be liable for any loss or damage caused as a direct result of Sassafras Solutions' negligence. Elements of this report may be reproduced, however assumptions need to be noted and this report referenced for full information.

1. Overview

This report outlines the calculations and results of greenhouse gas modelling for the National Ride to Work Day 2007 held on 17th October 2007. It uses data from that event based on information provided by registrants. The modelling covers both the event (actual data) and a year's projection. All assumptions and calculations are detailed. The projected modelling includes as much 2007 data as possible. Ongoing savings can be verified by follow-up survey five months after the event to measure behaviour change impact.

This modelling is compared to projections made in 2006.

The modelling included determining:

- greenhouse gases for the event day only. This was based on bike journeys that replaced car journeys (by kilometre),
- ongoing greenhouse savings from travel behaviour change stemming from the event, based on bike journeys that replaced car journeys (by kilometre) and
- congestion savings based on reduced car journeys (by kilometre).

The modelling is limited to an estimate of savings in the first 12 months. In reality, it is anticipated that many of the new riders who continue to ride in the first 5 months will continue this behaviour well beyond the first year, multiplying savings many times.

2. Basis for calculations

2.1. Definitions

AGO: Australian Greenhouse Office, with the new government sworn in during December 2007 this department is undergoing change.

Car alone: registrants who reported that they 'normally' drove to work alone 'at this time of year'

Car with others: registrants who reported that they 'normally' drove to work with a passenger or travelled as a car passenger 'at this time of year'

Congestion savings: summary of financial benefits of reduced congestion

Cumulative: additional GHG savings over the three-year life of the project, based on additional 24 months for first-timers who participated in 1st year, plus additional 12 months for first-timers who participated in 2nd year. Note that as these are all first year calculations there are no cumulative figures.

Event only: calculates the impact of National Ride to Work Day for the one day of the event only

First-timers on day: those who indicated on registration that they would ride for the first time on National Ride to Work Day 2007

First-timers in lead up: those who indicated on registration that they were planning to ride to work for the first time in the lead up to National Ride to Work Day 2007.

GHG: Greenhouse Gas

New riders: includes both first-timers on the day and first-timers in lead up.

Others: those who indicated 'I've ridden to work before' on registration

Projection: modelling figures calculated in 2006 based on data at that time.

Registered riders (RR): sum of new riders and others.

Revised: modelling figures calculated in January 2008 based on data at that time.

Still riding: These figures are based on surveying carried out in March following the event and tracks first time riders still riding 5 months after the event. This indicates behaviour change impacts of the event.

VKT: Vehicle kilometre travelled.

2.2. Constants

Congestion constant: \$0.356/VKT. This is the same factor for car alone or car with others. This is based on Victorian Department of Infrastructure guidelines. Congestion externality benefits have been derived for a number of driving conditions with an average 'All work trips (Peak)' decongestion benefits factor of 35.6 cents per vehicle kilometre travelled for metropolitan Melbourne¹.

GHG from cars:

Number	Units	Source
0.00033	tonnes GHG per km travelled car alone	As per AGO formula for average car
0.00016	tonnes GHG per km travelled car with others	As per AGO formula for average car with two occupants)

2.3. Assumptions

For the purposes of this exercise GHG reductions have only been incorporated for registered participants who reported that they normally travelled by car. Walking, cycling and public transport kilometres are measured here as zero contribution to GHG.

Modelling is designed to measure the GHG impacts of: the event alone; new riders who change their travel behaviour and continue to ride after the event; and the other riders who increase their riding after the event.

¹ Email personal communication with Bicycle Victoria, Heidi Marfurt 13/1/06

These figures are based on registered participants only. Information from workplace coordinators suggests that despite an active incentives package, participation in the event is considerably higher than event registration. While registration is free, it still takes time and will always do so if we wish to collect important data on previous travel, distances travelled and demographics.

It is assumed that the behaviour change impact for the 2007 event will be equivalent to that documented in previous years. Data used is:

Measure	Number	Unit	Source
Return trip distance (all riders)	22.18	km per day	Ride to Work Day™ 2005 report
Average frequency of riding per week (new riders)	2.3	Times	Ride to Work Day™ 2004 Follow-up report
% still riding (of new riders)	27%		Ride to Work Day™ 2004 Follow-up report
% car alone (new riders)	52%		Ride to Work Day™ 2005 report
% car other (new riders)	8%		Ride to Work Day™ 2005 report
Average frequency of riding per week (other riders)	3.3	times	Ride to Work Day™ 2004 Follow-up report
% increase in riding	10%		Based on unpublished results from RTWD 2004 follow-up research
% car alone (other riders)	39%		Ride to Work Day™ 2005 report
% car other (other riders)	9%		Ride to Work Day™ 2005 report

Where possible actual data is used in calculations as detailed in the results section.

2.4. Calculations

GHG (car alone, event only) = km travelled car alone * GHG constant for car alone

Where km travelled car alone counts the return kilometres travelled by registrants that indicated that they normally drove alone.

GHG (car with others, event only)= km travelled by car with others * GHG constant for car with others

Where km travelled by car with others counts the return kilometres travelled by registrants who indicated that they normally drove with others.

GHG (year after, new riders, car alone)

=number of new riders *average return trip * frequency of new riders riding * 52 weeks per year * % of first timers still riding * % of first timers car alone * GHG constant for car alone

GHG (year after, new riders, car with others)

=number of new riders *average return trip * frequency of new riders riding * 52 weeks per year * % of first timers still riding * % of first timers car others * GHG constant for car others

GHG (year after, others, car alone)

=number of other riders *average return trip * frequency of other riders riding * 52 weeks per year * % of increased riding * % of car alone * GHG constant for car alone

GHG (year after, others, car with others)

=number of other riders *average return trip * frequency of other riders riding * 52 weeks per year * % of increased riding * % of car others * GHG constant for car others

Avoided VKT, car alone and car with others, others event day only

= km travelled by car alone by RR + km travelled car others by RR

Avoided VKT, car alone and car with others, new riders in full year

= (number of new riders *average return trip * frequency of new riders riding * 52 weeks per year * % of first timers still riding * % of first timers car alone) + (number of new riders *average return trip * frequency of new riders riding * 52 weeks per year * % of first timers still riding * % of first timers car others)

Avoided VKT, car alone and car with others, others in full year

= (number of other riders *average return trip * frequency of other riders riding * 52 weeks per year * % of increased riding * % of car alone) + (number of other riders *average return trip * frequency of other riders riding * 52 weeks per year * % of increased riding * % of car others)

Congestion savings:

=Congestion factor*(total avoided kilometres)

3. Results

Note the following is data for registrations:

	New riders	Others	Total
2007 projection	4,472	16,477	20,950
2007 revised	7,393	21,654	29,047
% diff.	65%	31%	39%

*Where gray shaded figures are actual figures, other figures are modeled figures.

Comparing the modeled data to actual figures, GHG savings:

All states	GHG tonnes, event day, RR car alone	GHG tonnes, event day, RR car others	GHG tonnes, year after, new riders car alone	GHG tonnes, year after, fist timers, car others	GHG tonnes, year after, others, car alone	GHG tonnes, year after, others, car others	Total
2007 projection	61	6	550	41.0	807.2	90.3	1,555
2007* revised	80	9	909	67.8	1060.8	118.7	2,245
% diff.	32%	43%	65%	65%	31%	31%	44%

*Where gray shaded figures are actual figures, other figures are modeled figures.

Comparing the modelled data to actual figures, congestion savings:

All states	Avoided VKT, car alone and car with others, event day only	Avoided VKT, car alone and car with others, new riders in full year	Avoided VKT, car alone and car with others, others in full year	Avoided VKT, car alone and car with others, total	Congestion (saving)
2007 projection	222,983	1,922,099	3,010,546	5,155,627	\$1,835,403
2007* revised	298,991	3,177,335	3,956,332	7,432,658	\$2,646,026
% diff.	34%	65%	31%	44%	44%

*Where gray shaded figures are actual figures, other figures are modelled figures.

4. Conclusion

These figures illustrate that in the first year the event has well exceeded expected GHG and congestion savings.