UNIVERSITY OF TECHNOLOGY SYDNEY

INSTITUTE FOR SUSTAINABLE FUTURES

Institute for Sustainable Futures

BIKE RIDER AND BUS DRIVER INTERACTION STUDY

2012

ABOUT THE AUTHORS

The Institute for Sustainable Futures (ISF) was established by the University of Technology, Sydney in 1996 to work with industry, government and the community to develop sustainable futures through research and consultancy. Our mission is to create change toward sustainable futures that protect and enhance the environment, human well-being and social equity. We seek to adopt an inter-disciplinary approach to our work and engage our partner organisations a collaborative process that emphasises strategic decision-making.

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Bike rider and bus driver interaction study

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EXECUTIVE SUMMARY

Bicycles and buses are sustainable alternatives to private motor vehicle travel that can potentially play an important role in reducing congestion and transport based pollution. The numbers of people using these modes of transport in Sydney is growing and with it the importance of bike riders and bus drivers establishing norms of how to interact with one another in safe and harmonious ways.

This report describes the results from social research undertaken by the Institute for Sustainable Futures at the University of Technology, Sydney and funded by the City of Sydney's 2011 Environmental Grants Program. The research surveyed 405 bike riders and 112 bus drivers to investigate their experiences when interacting on Sydney streets and it details their suggestions for how interactions could be improved.

Buses and bikes have very different physical profiles and travel patterns. Bikes are small, manoeuvrable and travel at relatively slow but consistent speeds. Buses are large with limited manoeuvrability and whilst they can travel much faster than bikes, they stop regularly. These differences can contribute to anxiousness reported by individuals from each user groups during their interactions with the other. Over half the survey respondents from each group felt either 'slightly uncomfortable' or 'very uncomfortable' when interacting with the other. The survey found that younger and female bike riders were particularly likely to feel 'uncomfortable' when interacting with buses.

The report has five sections. The first provides an introduction to the study. Section 2 outlines the research and survey methodology. Sections 3 and 4 report on the survey findings, drawing comparative conclusions between bike rider and bus driver responses. Section 5 makes recommendations on how the positive responses from bike riders and bus drivers can be leveraged in a communication strategy, which are briefly summarised here.

Three issues in particular were widely reported by bike riders and bus drivers:

- **Overtaking**: the differences in size and speed make the overtaking of a bike by a bus an uncomfortable manoeuvre for both users. Bike riders would appreciate bus drivers displaying patience and providing them with maximum possible space when overtaking. Bus drivers would appreciate bike riders minimise the need to be overtaken by not passing buses at lights and giving way.

- **Communication**: both groups appreciate the other group communicating their presence and intentions on the road, for bike riders it is important that they make themselves visible to bus drivers through night lights and avoiding riding in blind spots. Both groups appreciate hand signals and eye contact.

- **Vehicle size**: their vulnerable road profile means that bike riders appreciate buses providing them with a lot of space when following, overtaking or pulling into a lane in front of them. Buses have limited manoeuvrability and drivers are responsible for the safety and comfort of passengers and therefore would appreciate bike riders riding in a predictable manner.

The table below indicates potential suggested road behaviours that each group could adopt based on the survey responses. These behaviours should be understood as preliminary suggestions only and should ideally be tested and explored by a workshop or focus group where the two groups could discuss the issues and suggestions directly. If they were confirmed, these suggested behaviours could form the basis of a communications campaign aimed at improving the safety and harmony of interactions between these two groups.

Suggested bike rider behaviours	Suggested bus driver behaviours
Avoid overtaking buses stopped at lights	Avoid getting too close when following bikes
Give way to buses leaving a bus stop	Be patient and only overtake bikes when it is possible to pull entirely into an adjacent lane
When a bus cannot move into another lane to overtake consider pulling over to let the bus pass when a safe opportunity arises	Leave plenty of space for riders when pulling back into the lane
Use hand signals to signal intentions	Use hand signals to direct to bikes what the driver would like them to do
Make eye contact	Make eye contact
Use lights and bright clothing to ensure visibility	Acknowledge cooperative riders by smiling or waving
Avoid riding on the inside of stopped buses	Give way to bike riders where possible

1 INTRODUCTION

The City of Sydney is undertaking a program of significant investment in cycling facilities, and these investments have prompted a rapid growth in bike rider numbers – on average, 82% growth over two years. This growth is set to continue as the City continues its investment in cycling facilities with the aim of meeting its target of 10 per cent of all trips within the City to be undertaken by bicycle by 2016. Simultaneously bus patronage is growing and it is likely that interactions between these two road users will continue to grow on Sydney streets.

Whilst the City of Sydney is significantly enhancing its network of bicycle infrastructure and providing lanes separated from motor vehicles, Sydney's bus lanes will continue to play an important role in allowing bicycle riders access to and through the city. The bus lanes on Oxford St, George St and Broadway are all popular routes for bicycle commuters. In the case of Oxford Street there are few alternative direct routes between the city centre and the inner east.

Bicycles and buses represent opposite ends of the road user spectrum in terms of the physical size and manoeuvrability of vehicles. These differences mean sharing road space can be a source of anxiety for both bike riders and bus drivers. For bike riders this anxiety is a product of both real and perceived safety concerns of sharing the road with much larger vehicles. These real and perceived safety concerns can act as a significant barrier to the uptake of cycling for transport and deter bike riders from riding more frequently.

Bicycle riders themselves can be the cause of anxiety for bus drivers. Riders can behave unpredictably in narrow lanes — most riders do not have the experience of driving a bus and so are not aware of the blind spots and lack of manoeuvrability of driving a large vehicle.

Given that bike ridership in Sydney is still comparatively low, both bus drivers and bike riders have not yet established norms on how to interact with each other in a safe and harmonious way. But despite the current unease, buses and bicycles are natural allies. Buses and bicycles both provide alternatives to single occupant motor vehicle use, resulting in a cleaner environment and reduced congestion.

This report details social research undertaken with bike riders and bus drivers examining their experiences of the two groups interactions on Sydney streets. The research illuminates the issues facing these two road user groups and also details instances of exemplary behaviour that could be used in a communications campaign as examples of how bike riders and bus drivers can co-exist in a more safe and harmonious way.

The report first outlines the research and survey methodology in Section 2. It then reports on the survey findings and makes comparative conclusions between bike rider and bus driver responses (Sections 3 and 4). It concludes by making recommendations on how the positive responses can be leveraged in a communication strategy (Section 5).

2 RESEARCH METHODOLOGY

To gain insights into the perceptions, issues and positive experiences of bike riders and bus drivers in Sydney the Institute conducted online surveys of both groups. The surveys were designed in consultation with the City of Sydney and BikeSydney. The survey included demographic questions, closed questions (e.g. multiple choice questions) as well as open questions where respondents were able to respond in their own words. The closed questions aimed to quantitatively assess under what conditions they felt uncomfortable interacting with the other group. The open questions allowed space for bus drivers and bike riders to reflect on their perceptions of reasons for any feelings of discomfort and to report additional issues and concerns that might not have been involved in the closed questions. Importantly, to identify potential levers for positive behaviour, the survey also included open questions that aimed to identify how bike riders or bus drivers could act to make the other group feel more comfortable, and to report behaviour that has been perceived as positive or exemplary.

This way of inquiry was inspired by comments from BikeSydney that they typically receive two types of stories from the cycling community in relation to bus driver behaviour — these are either very positive or very negative. It is also inspired by a research technique referred to as Appreciative Inquiry (AI); AI argues that development also moves towards the direction of inquiry, and that it is therefore more valuable to investigate what works well rather than what doesn't[1]. Both surveys are included in Appendix A.

The surveys were distributed across various networks to reach all relevant groups. On the cycling side, relevant groups include commuters, sports cyclists, recreational bike riders, bike couriers and inexperienced bike riders. They were contacted through the newsletters of several bicycle user groups, the Sydney Cyclist blog, the UTS Cyclist mailing list as well as the Institute's contacts in the cycling community. The survey received 405 responses (response rate cannot be calculated as the survey was distributed through open channels). The bus driver survey was distributed to all State Transit Authority (STA) bus drivers via the STA mailing list (~2,100 recipients). It received 112 responses (~5% response rate). These response rates exceeded the rates that were initially proposed in the grant application (150 bike rider responses and 30 bus driver responses), indicating a wide public interest in the subject.

[1] http://www.tapin.in/images/Appreciative%20Inquiry%20-%20Positive%20Revolution%20in%20Change.pdf

3 BIKE RIDER SURVEY RESPONSES

3.1 SUMMARY

405 bike riders undertook the survey, the respondents tended to be male, regular commuting riders. 59% of respondents reported being 'slightly uncomfortable' or ''very comfortable' riding around buses. Female riders and younger riders were more likely than other riders to report being uncomfortable riding around buses. The results of the survey indicated a number of behaviours that bike riders would like bus drivers to undertake. These behaviours include:

- Acknowledging and communicating with bike riders, for example through hand signals and smiles.
- Being patient and providing sufficient space when overtaking
- Not cutting in front of a bike rider to enter a bus stop
- Slowing down and driving patiently when behind a bike rider
- Showing goodwill to riders and giving way to bikes where possible

3.2 DEMOGRAPHICS

405 bike riders undertook the survey (with 339 participants or 83.7% completing all questions). The respondents tended to be male, regular riders who mostly rode in the inner city and CBD and mainly for commuting purposes. The detailed demographic breakdown is as follows:

- The age of the participants was widely and evenly distributed, with 86.6% of participants aged between 26 and 59.
- 66.7% of bike riders were male, 33.3% female.
- 53.1% of participants cycle more than 4 times per week, and another 37.9% between one and four times a week.
- The most common trip purpose was the commute to work (63.8%), followed by leisure/exercise (35%) and other functional trips (24.2%).
- Participants mostly used on-street car lanes for their trips (43.9%), with other types of roads and paths ranging between 11.6% (on street bus lane) and 18.1% (on street bike lane). 16.1% of participants indicated they were using designated cycleways for their trips. The research however does not provide insights on the percentage of cycleways available for these trips.
- The top 10 suburbs bike riders frequented were:

Suburb	Number of bike riders
City/city centre	129
Newtown	45
Surry Hills	39
Randwick	26
Redfern	26
North Sydney	24
Bondi	19
Marrickville	18
Parramatta	14

Darlinghurst	13
Glebe	13
Annandale	11
Leichhardt	11
Paddington	11
Manly	10
Ultimo	10

3.3 COMFORT INTERACTING WITH BUSES

More than half of the bike riders surveyed reported they were at least somewhat uncomfortable when interacting with buses, in particular when they are overtaken or followed by buses at close distance. Younger and female bike riders tended to be more uncomfortable when interacting with buses.

- In total 59% of bike riders answered they were either slightly uncomfortable (37.7%) or very uncomfortable (21.3%) when interacting with buses.
- Only 10.2% of riders reported they were very comfortable interacting with buses.
- There was a significant difference between bike riders feeling comfortable interacting with buses and their age: Of the 37 respondents who indicated they felt 'very comfortable' 51.4% were in the 35-44 age bracket and 24.3% in the 45-59 bracket, while only 2.7% are aged 26-34. Bike riders aged between 35 and 59 felt at least reasonably comfortable in 45 to 50% of cases, while bike riders aged 26-34 felt reasonably comfortable in only 23.7% of cases.
- There was also a significant difference between bike riders feeling comfortable interacting with buses and their gender: 27.8% of females felt at least 'reasonably comfortable' compared to 48.1% of males. Importantly, 33.6% of females felt 'very uncomfortable' compared to 15.8% of males.
- Most bike riders indicated they were 'uncomfortable' when being overtaken at very close distance (81%), when a bus is driving very close behind them (67.8%) and when buses re-enter the lane right before a bus stop (66.9%).
- 40.6% of bike riders reported trying to make eye contact when approached or overtaken by a bus and slowed down to let the bus overtake (34.4%). By contrast, 34.6% of bike riders state that they don't change their behaviour.

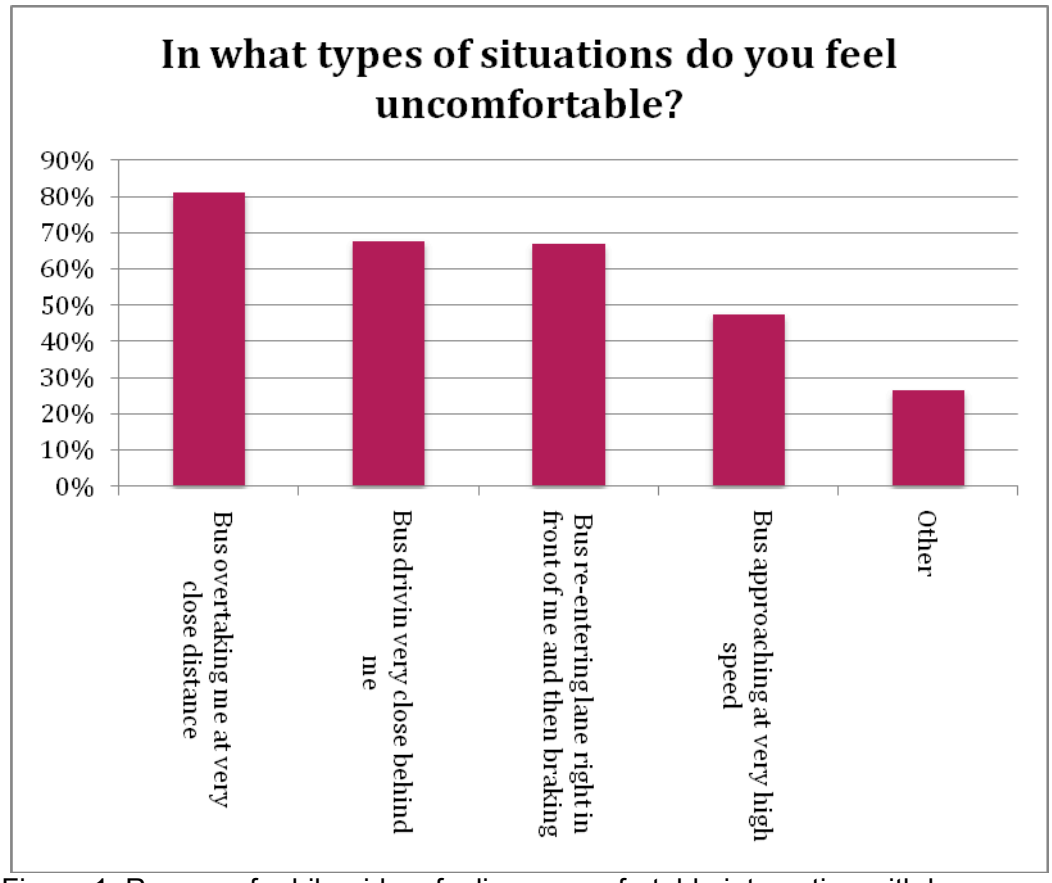

Figure 1: Reasons for bike riders feeling uncomfortable interacting with buses

3.4 WHAT CAN BUS DRIVERS DO TO MAKE BIKE RIDERS FEEL MORE COMFORTABLE?

Bike riders were asked whether they had experienced exemplary bus driver behaviour and if so what this behaviour had been. They were also asked to give examples of what drivers could do to make them feel more comfortable, however the responses to this question were largely negative versions of the examples of exemplary behaviour and so are not analysed separately.

56.9% of participating bike riders reported they had experienced a bus driver displaying exemplary behaviour. When asked for examples of exemplary behaviour 48.1% of participants replied and most respondents replied with examples of positive behaviour rather than negative stories (as a high percentage of bus drivers did, see below). The examples of exemplary bus driver behaviour content have been grouped into the following groups:

- **Acknowledgement and communication**, e.g. eye contact, nods, waves, smiles
- **Patience/distance when overtaking**, e.g. allow bike riders to get out of the way safely, change lane
- **Patience/distance around bus stops**, e.g. not overtaking immediately before bus stops and letting riders pass the bus stop area before pulling in to the stop
- **Patience/distance when following bike riders**, e.g. slowing down and providing riders with enough space, not revving the engine

- **Goodwill** e.g. giving way when possible

The proportion of bike riders reporting these behaviours are shown in Figure 2 whilst examples of quotes provided by respondents are provided in Table 1.

Figure 1: Examples of exemplary bus driver behaviour reported by bike riders

Table 1: Example quotes of exemplary bus driver behaviour

Type of behaviour	Quotes
Acknowledgement and communication (30%)	• A few times bus drivers have complimented my riding - helps me feel better when I know they are more comfortable driving around me when I'm riding considerately and predictably. • Hand signal to tell me his intention or direct me what to do • Indicated a clearway for me when my vision was blocked by a bank of buses in peak hour traffic. This allowed me to turn left from a side street into a main road safely. • The bus driver returned my eye contact, waved and smiled at me. I felt safer because I knew he was aware of my presence. • Made eye contact and waived me on • The driver returned my eye contact which then showed me he had seen me and perhaps meant he would give sufficient room • Sometimes they make eye contact just to let you know what they're going to do. That's very helpful • Don't underestimate the power of the smile - there are some

	great drivers out there - really great
Patience/distance when overtaking (25%)	• Some bus drivers have moved across half a lane to pass me with plenty of room to ensure that their draft does not affect me. (My main interaction with buses is on a 70-80km/h road, so the main danger I face is the 'bow wave' of air as the bus passes - this can sometimes be enough to affect my balance). I am always appreciative when this occurs and would like to say thank you. When in a bus lane if the bus catches me up and there is a normal lane available they safely overtake • Let me overtake when I was most of the way alongside the bus an not pull out in front of me and cut me off. Also, give me enough room to feel I was part of the traffic! • Stayed well behind me until it was safe for him to overtake me by fully changing lanes • Overtook me with ample space for safety before fully re-entering the lane • Stopped and waited for us to proceed to a safe location. I waved him on when it was safe to overtake us. He gave me a beep and a wave to say thanks.
Patience/distance when bus stops are involved (17%)	• Slowed down as he approached me, changed to the right hand lane and slowly pulled up alongside me before allowing me to speed up to let him safely enter the left hand lane again and pull in at the bus stop. Any driver who moves fully into the right hand lane to overtake should be commended. • Bus drivers frequently wave me on when I am passing them from behind and they are preparing to leave a stop; they wait for me to cross traffic signals if I am late crossing a green phase and it changes while I am crossing; they slow down and hang back a good distance if they come up behind me but they are about to pull into a stop. • Checked their mirrors and waited until I and any other vehicle had passed until they pulled away from curb to rejoin the flow of traffic
Patience/distance when following bike (24%)	• Just maintain a safe distance behind me and/or overtake using a safe distance and not be frustrated by the fact I'm going slightly slower than he/she is. • I signalled that I was turning left soon and they just went along behind me nice and quietly at a good distance until I turned off the road. That was nice. • I find that more frequently drivers will sit behind me and not try to overtake. This makes it far more comfortable to ride in the bus lane or ride in the general traffic lane. I think too that just be alert to bicycle riders, making eye contact and acknowledging that they have seen you when you are changing lanes or turning makes a huge difference to how comfortable I feel on the road.

Goodwill/give way when possible (23%)	• Very often a bus driver will give way to me in a roundabout which, though his legal duty, is not something a lot of cars do. • Slowed down and signalled me pass. When I was about to pass her window, I thanked her and she said Have Fun!!! • He smiled and gave me the 3-4 seconds I needed to get ahead of him when he entered the bus lane. • Waved me across a junction with a big smile. I returned the favour further down the road. Really made my day. • Slowed down and motioned to go in front of him when my lane was ending

4 RESPONSES OF THE BUS DRIVER SURVEY

4.1 SUMMARY

112 bus drivers undertook the survey, the drivers who took the survey tended to be male, experienced drivers and over the age of 45. 68% of bus drivers reported being either 'slightly uncomfortable' or 'very uncomfortable' driving around bikes. The results of the survey indicated a number of behaviours that bus drivers would like bike riders to undertake. These behaviours include:

- Obeying road rules
- Not riding through stopped traffic at lights to the front of a queue when there is a bus in the queue. This often means buses need to overtake the same rider multiple times and overtaking bike riders is one of the situations where drivers feel most uncomfortable.
- Giving buses space, keeping to the left of lanes and where bike riders need to take an entire lane, taking opportunities to pull over and allow the bus to pass.
- Using hand signals and eye contact.
- Wearing high visibility clothing.
- Not cutting in front of a bus, either from the footpath or from behind parked cars.
- Be aware that buses have blind spots (particularly near the front door).

4.2 DEMOGRAPHICS

112 bus drivers undertook the survey (with 74 participants or 66.1% completing all questions). The participants tended to be male, very experienced drivers and in the older age brackets:

- The dominant age brackets of drivers were 45 – 59 (49.5%) and 35 – 44 (22.9%)
- 88.3% of drivers were male.
- On average the drivers who participated in the survey were very experienced; 45% had been driving for over ten years, a further 30.6% between five and ten years. Only 11.7% of drivers had been driving for less than two years.

4.3 COMFORT INTERACTING WITH BIKE RIDERS

Two thirds of drivers were at least 'somewhat uncomfortable' with bike riders. In particular slow, erratic bike riders and riders who rode two or more abreast made drivers uncomfortable. The issue of bike riders riding in bus lanes appears to be particularly problematic for bus drivers as they often commented that there is not enough room in a lane for both a bus and a bike rider.

- In total 68% of drivers answered they were either 'slightly uncomfortable' (38.5%) or 'very uncomfortable' (29.5%) when interacting with bike riders.
- Only 8.3% of drivers reported they were 'very comfortable' interacting with bike riders. There were no significant differences between drivers feeling comfortable interacting with bike riders and the driver's experience or age. This indicates that all drivers are facing the same issues.

- Most drivers indicated they were 'uncomfortable' when overtaking a slow rider (69.1%), when riders do not ride in a straight line (67%) or when two riders ride side by side (57.7%)
- Most drivers slow down (71.6%) or change into the car lane (51.5%) when they approach a bike rider.

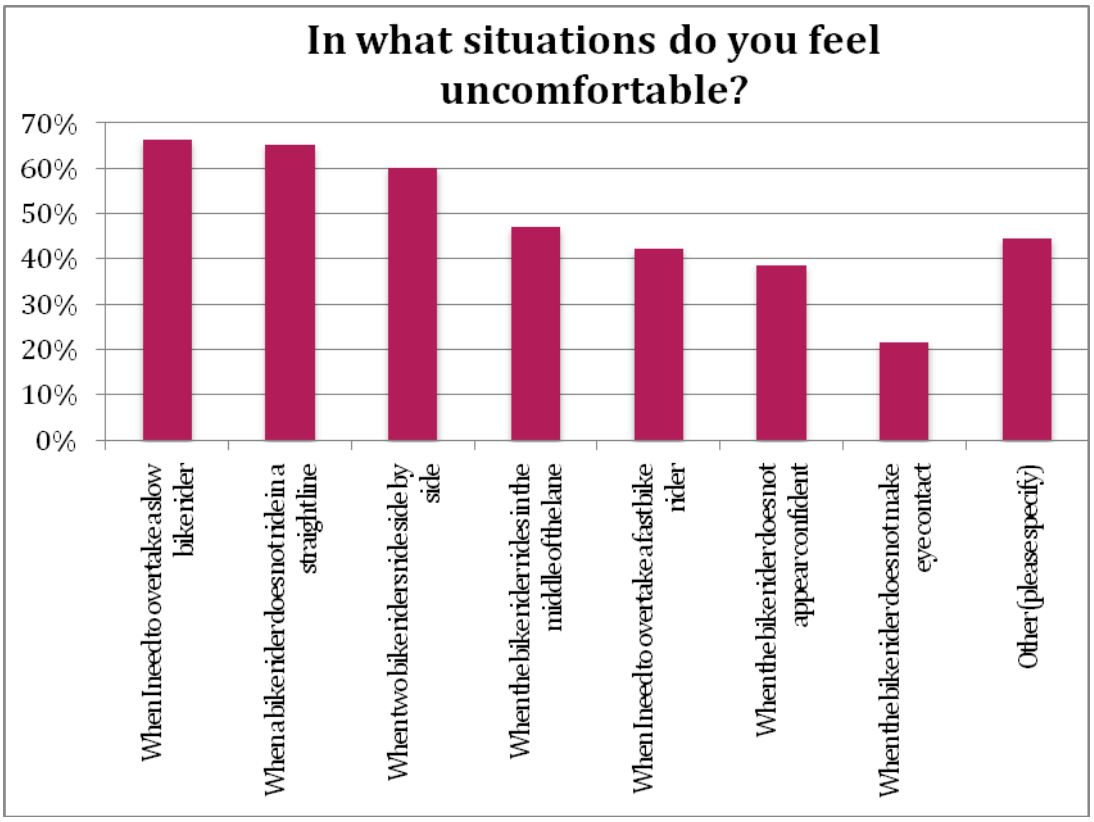

Figure 3: Reasons for bus drivers to feel uncomfortable interacting with bike riders

4.4 EXEMPLARY BEHAVIOUR

55.6% of participating bus drivers reported they had experienced a bike rider displaying exemplary behaviour. When asked for examples of exemplary behaviour, 45% of respondents replied with examples of bad behaviour the most common of which was bike riders being rude or aggressive (12 respondents). The examples of exemplary behaviour (with negative responses excluded) have been grouped and the proportions shown in Figure 4. Quotes from bus drivers describing exemplary rider behaviour are shown in Table 2.

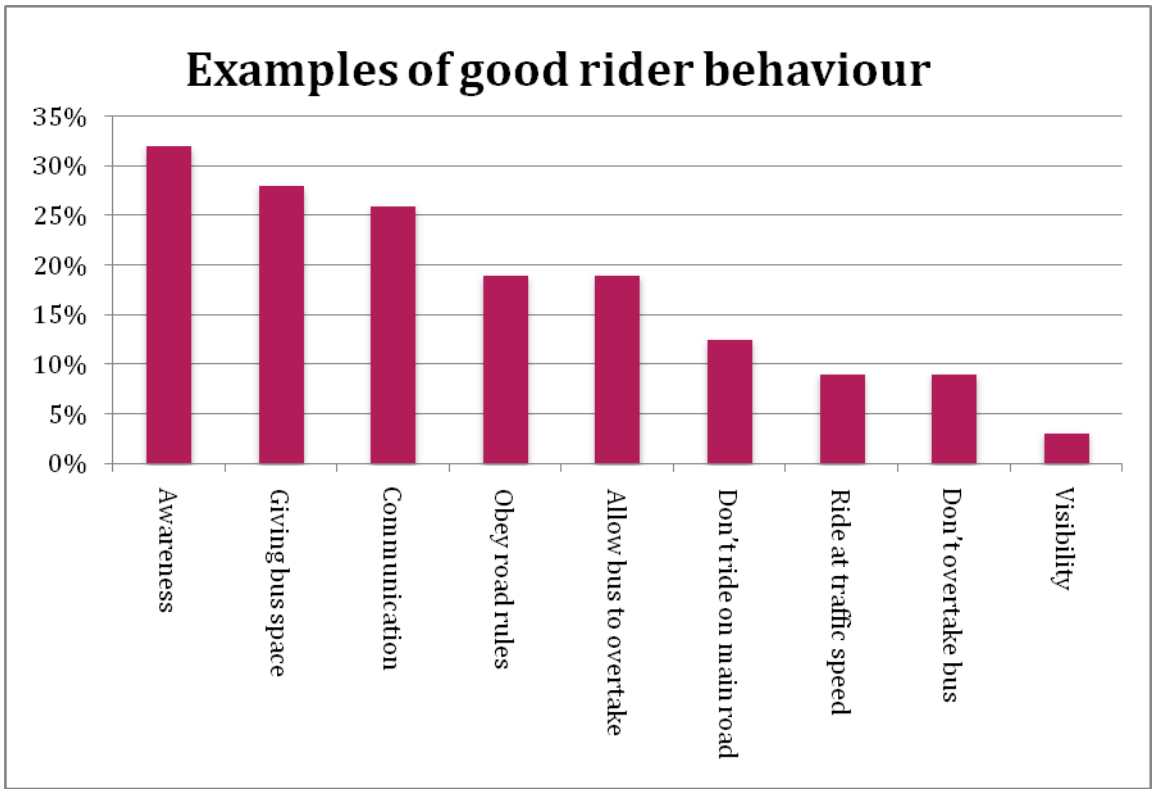

Figure 4: Examples of exemplary bike rider behaviour reported by bus drivers

Table 2: Example quotes outlining exemplary bike rider behaviour

Type of behaviour	Quotes
Awareness (32%)	• "They kept looking over their shoulder" • "These riders look around to see what is happening"
Give the bus space (29%)	• "There are occasions when a rider realises that a bus needs more room to turn and stop and allows for this" • "Moved over when safe and made it easier to pass. Accelerated when going past a bus stop so quicker for me to get in"
Communication (26%)	• "The bike rider made eye contact, and signalled their intentions, allowing me plenty of time to allow him to pass" • "He waved back to acknowledge me giving him way" • "He waved me around him" • "Used hand signals"
Allow bus to overtake (19%)	• "After having me follow him for some distance with no opportunity to pass due to heavy traffic, when a suitable opportunity arose he pulled over into a small slip lane and waved me through" • "Moved into a long gap between parked cars and slowed down to allow the bus to pass"
Obey road rules (19%)	• "Obeyed traffic regulations and rode safely whilst wearing helmet and safety clothing"

4.5 WHAT CAN BIKE RIDERS DO TO MAKE BUS DRIVERS FEEL MORE COMFORTABLE?

Bus drivers were asked what bike riders could do to make drivers feel more comfortable. As would be expected for an open ended question there was a great diversity of answers, however by far the most common response (reported by 51% of drivers) was for bike riders to obey the road rules.

All issues that were commented on by more than 10% of drivers and examples of their comments are provided in Table 3 below.

Table 3: Issues of concern reported by bus drivers

Issue	Quotes
Obey the road rules (51%)	• "Respect the road rules. Don't run red lights. Manage your own safety. Do not weave in and out of traffic and expect all other road users to be responsible for their safety" • "Not ride through red lights. Not move into lane without warning…Not ride on pavement when passengers are exiting the bus"
Bus size (18%)	• "Not overtake on the inside where there is limited room" • "Accept that it is easier and safer for a bicycle to divert onto a footpath to allow normal traffic flow of other vehicles than it is for a 16 ton vehicle and other traffic to manoeuvre around a bicycle" • "Taking evasive action in a 18 ton vehicle can be very stressful: • "Understand that we are driving a nearly 30 tonne vehicle with up to 120 passengers all without seat belts including standing, elderly and pregnant passengers and we need a little space to safely slowdown, stop or merge." • "They don't fit in a lane that is 2.5 wide, the same width as a heavy vehicle. This is one of the most dangerous and high risk potential for workers comp travel injuries, not to mention the effect on the driver if there is an incident."
Overtaking at lights (13%)	• "By not overtaking buses especially at red lights. Overtaking a bike rider is stressful enough once nevermind the same one 3 or 4 times" • "At red lights many times we have bikes ride up along side of us in the gutter and then stop right in front of us…an aware and safe rider will keep behind the bus and wait for us to clear the lights and pass us once we have made our stop to pick up passengers"
Awareness (12%)	• "Be aware of their surroundings and follow the road rules. Communicate with other road users" • "Take care on the road"

	• "Be aware of the bus especially in peak hours because of the full load we are carrying and move over to allow us to pass"
Use the bike lane (12%)	• "It is a pity that bike riders do not have more dedicated cycle lanes, as this would make them much safer, but until the state government supports the Sydney City Council they will take a while to roll out" • "If bike riders can consider riding along bike lanes, side streets and bridges that the government has recently spent millions building"
Avoid peak times (10%)	• "Accept that bus lanes are designed to allow buses better movement through heavy traffic corridors and to keep clear of bus lanes during peak hours"
Show courtesy (10%)	• "By showing courtesy bike riders and buses can use the road safely, together"
Visibility (10%)	• "There are still many bike riders that ride without any form of lighting at night. There is one other thing that would be a big bonus and that would be for riders to have the lights on their bikes attached to the bike and not to their heads. It is very distracting to have the very bright LED lights wandering about in a non focused way. This can have the effect of reducing the vision at night of other drivers in the same way that a car with their High Beam lights on around other vehicles."

5 CONCLUSION

5.1 DISCUSSION OF RESULTS

This report has detailed the results from two online surveys focussing on the interactions between bike riders and bus drivers on Sydney streets. It has identified several areas of concern for each group as well as examples of exemplary behaviour that could provide the basis of a communication campaign focussing on improving the relationship between these two groups.

The results show clearly that these two groups are finding interacting with one another difficult in constrained road conditions. Over half of the respondents from each group reported that they were either 'somewhat uncomfortable' or 'very uncomfortable' interacting with the other group. The responses of bus drivers varied little on the basis of age, gender or experience, by contrast amongst bike riders younger and female riders were much more likely to feel uncomfortable around buses.

Major issues of concern for each group are summarised in Table 4 and suggestions of good road behaviour are summarised below:

Table 4: Summarised issues of concern and suggested behaviours

	Bike riders	Bus drivers
Issues of concern	• Buses overtaking • Buses following at a close distance • Buses cutting in front of bike riders especially near bus stops • Providing adequate space	• Bikes not obeying road rules • Having to overtake bikes • Bikes travelling unpredictably including cutting in front of buses • Bikes moving to the front of the queue at lights • Providing adequate space for buses to turn and brake • Bike visibility (including night visibility and riding in blind spots) • Not giving way to buses pulling out from stops
Suggested behaviours for the other group	• Acknowledge and communicate • Provide space when overtaking • Be patient and provide sufficient distance when following • Show good will and give way where possible • Be patient and provide sufficient distance around bus stops	• Be aware of surroundings and other road users • Communicate with other road users • Understand bus size and weight and allow sufficient space to turn and/or brake • Avoid overtaking buses at lights and give bus the opportunity to overtake when possible

These results suggest that there are significant overlaps in the issues that are concerning to both groups and how they would like them to be addressed. These areas of overlap could potentially form the core of a communication campaign aimed at improving relations between the two groups. These overlapping issues are considered briefly below and some preliminary suggestions made, however it would be fruitful for these issues to undergo further exploration and testing with the two groups before they are used as the basis of a communications campaign.

Overtaking

Probably the most important area of concern for both groups are issues related to overtaking. Bikes and buses have very different speed profiles, bikes travel at relatively slow speed but rarely stop and in contrast buses travel at a faster speed but need to stop more regularly. This leads to a situation where each user is forced to overtake the other in order to travel in the fastest possible manner. The vast difference in size makes the overtaking manoeuvre a potential point of danger and therefore a stressful encounter for both groups. For bike riders their main concern is that buses provide them with sufficient space, preferably by moving entirely into the adjacent right lane, while overtaking and that they provide sufficient space when cutting back into their original lane. For bus drivers their main concern is to minimise the need for overtaking, therefore they would prefer bike riders to not overtake them whilst stopped at lights and to give way to buses pulling out from stops. In constrained road situations where buses are forced to follow bikes for a significant distance drivers appreciate riders who make use of an opportunity to pull over and let the bus pass. A communication campaign aimed at both groups and focussing on overtaking etiquette could potentially have significant benefit in increasing perceptions of comfort and safety in both groups.

Communication

Within the examples of exemplary behaviour issues of communication, awareness and acknowledgment were commonly reported amongst both groups. Even in an area as heavily regulated and legislated as road behaviour it is remarkable how important simple gestures of politeness and acknowledgement can be in creating a positive perception amongst other road users. As one bike rider noted, “Don’t underestimate the power of a smile – there are some great drivers out there”

Vehicle size

Bikes and buses are obviously very different sizes and for each group vehicle size leads to specific concerns that they believe are not well understood by the other group. In the case of bikes they are small and their riders are, relative to other road users, highly exposed. This makes bike riders vulnerable and they are often intimidated by a large vehicle following close behind them or overtaking them at speed (which can cause a breeze that makes it difficult for a rider to maintain balance). Riders worry that buses pulling into a lane in front of them may side swipe their bike with the back of the bus and feel squeezed into the gutter when a bus overtakes close to them.

Bikes are also highly manoeuvrable and in order to travel at a reasonable speed they will often weave between lanes or squeeze between stopped traffic. Buses on the other hand are heavy and have limited manoeuvrability; the unpredictable movement of bikes was reported by many drivers as making them feel uncomfortable. One driver stated that bike riders need to “understand that we are driving a nearly 30 tonne vehicle with up to 120 passengers all without seat belts including standing, elderly and pregnant passengers and we need a little space to safely slowdown, stop or merge.” Bus drivers were also

uncomfortable when bike riders rode in their blind spot and when the rode along the inside of a stopped bus.

The issues raised above suggest a range of positive behaviours that each group could undertake to improve the interactions between the two groups on the road. Table 5 outlines some suggested positive behaviours, however it should be noted that these preliminary suggestions should be further tested with the two groups.

Table 5: Suggested behaviours arising from the research

Suggested bike rider behaviours	Suggested bus driver behaviours
Avoid overtaking buses stopped at lights	Avoid getting too close when following bikes
Give way to buses leaving a bus stop	Be patient and only overtake bikes when it is possible to pull entirely into an adjacent lane
When a bus cannot move into another lane to overtake consider pulling over to let the bus pass when a safe opportunity arises	Leave plenty of space for riders when pulling back into the lane
Use hand signals to signal intentions	Use hand signals to direct to bikes what the driver would like them to do
Make eye contact	Make eye contact
Use lights and bright clothing to ensure visibility	Acknowledge cooperative riders by smiling or waving
Avoid riding on the inside of stopped buses	Give way to bike riders where possible

5.2 NEXT STEPS

The results generated by this research could be used as the basis of an information campaign aimed at encouraging positive behaviours and improving relations between the two groups. The communication strategy could take a number of forms; a few potential options are described below:

- Information for current and potential bicycle riders that alerts them to the concerns of bus drivers and provides advice for riding safely to be distributed via bicycle user groups and the City of Sydney's Cycling Confidence courses.
- Information for bus drivers that alerts them to the concerns of bike riders and provides advice about sharing the road with more vulnerable users (this can serve as the basis for developing a driver education program).
- Experiential learning activities, for example, giving bike riders the opportunities to adopt the role of a bus driver to become more aware of blind spots.
- Peer-learning programs where exemplary bus drivers can mentor their colleagues.
- Use the positive behaviours identified in Q11 as a basis for a 'thank you' document. That is, the document would say something along the lines of 'Dear bus drivers, Sydney bike riders would like to thank you for...'. This document could either be printed on posters or we could

initiate a personal delivery where bike riders hand the thank you letter over to bus drivers.

The findings from this research should be seen as preliminary and it would be beneficial if they were tested and the issues explored directly by representatives of the two groups (e.g. a stakeholder workshop or focus group). The direct interaction of stakeholders in the workshop would allow for joint issue- and solution-finding to take place. This helps develop constructive solutions that are better accepted amongst stakeholders.

The suggested format for this workshop would be for a summary of this research to be presented to the participants and that workshop participants will first discuss the survey results to establish common ground. Participants will then engage in a visioning exercise to identify how interactions should ideally take place and establish common objectives. Finally participants will define positive behaviour patterns and develop possible strategies to encourage the uptake of these behaviour patterns.