



## Appendix E

### SMBI Travel Survey







# **Southern Moreton Bay Islands**

## **Travel Survey**

*Final Report*

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## **1 INTRODUCTION**





The four islands of Russell Island, Macleay Island, Lamb Island and Karragarra Island are situated in the southern part of Moreton Bay, Queensland. Based on the 2006 census data, there are 4,235 permanent residents on the Islands with the two bigger islands Macleay Island (1,958 persons) and Russell Island (1,778 persons) and the two smaller islands Lamb Island (372 persons) and Karragarra Island (124 persons).

The inhabitants of the Southern Moreton Bay Islands are facing special and unique travel needs. Since there is no fixed link to the Mainland, the Islanders rely on shipping traffic for multiple purposes, be it for working on the Mainland, the supply of the local supermarket, medical emergencies or recreational trips.

Currently there is a passenger ferry and a regular vehicle barge connecting all Islands to the Mainland. Due to the fact that the population of the Southern Moreton Bay Islands has been experiencing constant growth in recent years, there is need to face the different strategies on how to solve transport and parking woes.

One long-standing approach is characterised by building a bridge connecting Russell Island to the Mainland. This has further developed to the construction of a chain barge which would provide an almost fixed crossing to the Mainland. Other strategies would contain increasing parking opportunities at the already existing parking facilities at the ferry or barge landing sites to encourage the Islanders' commuting patterns or building a multi-storey car park. Furthermore there is the option to build new facilities or enhance the already existing services provided on the Islands; for example police stations for the Islands were opened in 2008 on Russell Island and Macleay Island.

Therefore it is crucial to get a detailed understanding of the travel patterns of the Islanders.

To gain this information, *Socialdata* conducted a travel survey in July / August 2010. The outcomes will be outlined in this report. Chapter 2 describes the methodology used and chapter 3 summarises highlight results in graph format. Further – very detailed – results are provided in appendix 1.

Additional information on the calculation of main modes is included in appendix 2 and appendix 3 is a summary of the implemented survey methodology.



## **2    *METHODOLOGY***





## 2.1 Survey design

The *Socialdata* travel behaviour research methodology (known as the New KONTIV® Design) uses a mixture of tools and techniques to obtain a complete portrayal of mobility behaviour. Originally developed for the German Transport Ministry during the 1970s, this approach has been used widely in national and international travel surveys (including the Netherlands National Travel Survey with an annual sample of over 50,000 people net) and in the evaluation of personalised travel planning projects in Europe, Australia and North America. *Socialdata's* survey techniques have been the subject of continuous external expert scrutiny for more than 35 years and have been independently audited and verified on a number of occasions.

The methodology for the travel survey is described in the following section. The research programme was conducted according to the methodology and principles which are set out in Appendix 3.

The *Socialdata* methodology uses a one day mail-back diary technique supported by motivation and validation by phone, proven to be the most reliable method for collecting data on travel behaviour. It consists of a questionnaire sent to each household in the survey sample together with a set of individual travel diaries for all household members for a nominated day of the week. The survey form is designed to collect information about all trips related to individual activities performed at all out-of-home destinations on the nominated travel day. Rather than relying on over-prescriptive and often confusing categories, the questionnaire design allows respondents to report their activities in their own words, helping to increase the quality and accuracy of the data.

The travel survey covers all days of the week and people of all ages, and is to include all members of the household. The questionnaire is mailed to each household in the survey sample, together with a set of individual travel diaries for all household members for their nominated day of the week.





## 2.2 Survey implementation

The survey was conducted with a random sample of residents in July / August 2010 with 714 households responding, representing an 82 % response rate. With a total of 1,373 persons responding, the sample covers around 25 % of the Islands population and is – in statistical terms – fairly robust.

	TOTAL	KARRA-GARRA	LAMB	MACLEAY	RUSSELL
Mail out Gross	1,000	70	150	400	380
Sample loss	128	8	19	49	52
Adjusted household gross	872	62	131	351	328
<b>Returns households</b>	<b>714</b>	<b>50</b>	<b>108</b>	<b>294</b>	<b>262</b>
<b>Returns persons</b>	<b>1,373</b>	<b>90</b>	<b>201</b>	<b>559</b>	<b>523</b>
<b>Response rate</b>	<b>82 %</b>	<b>81%</b>	<b>83%</b>	<b>84%</b>	<b>80%</b>

The sampling strategy for the survey was determined by the requirement to get a representative picture of mobility for the population of the Southern Moreton Bay Islands. The survey area covered all four inhabited Islands (Karragarra, Lamb, Macleay, Russell Islands). The sample was randomly selected and stratified to ensure a sufficient sample size to provide reliable data for an analysis at island level.

## 2.3 Definitions

The results of these evaluations give a representative picture of everyday travel patterns of residents (excluding commercial and freight traffic and trips longer than 100 km).

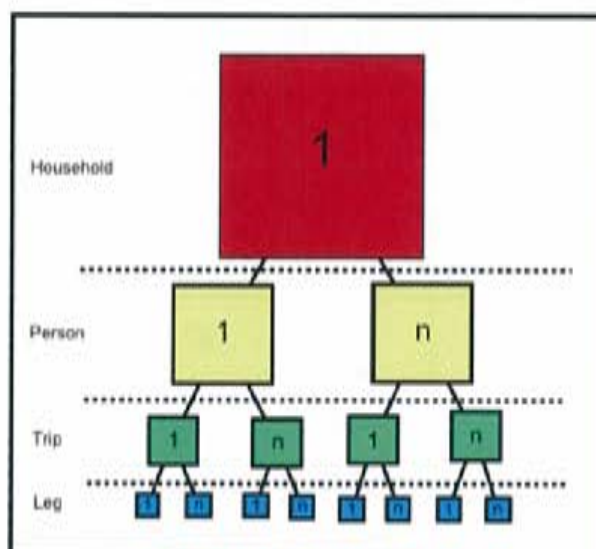
The number of trips per person per year is calculated on 341 days to take into account the number of days that a person travels away from home, for example on holidays or business. The following explanations refer to the terminology used throughout this report.



### 2.3.1 Database structure

#### a) Vertical structure

All information collected in the survey is entered in one database which consists of four levels of aggregation: Household, Person, Trip, Leg.



*Household:* A household consists of at least one household member.

*Person:* All household members are included in the database. If the person made a trip on the allocated sample day, he/she is referred to as mobile person. If the person has not made a trip on his/her sample day (for example because of sickness or he just did not need to leave the house) he/she is referred to as immobile person.

*Trip:* Travel from one destination to another to carry out an activity.

*Leg:* Trips are comprised of different stages, classified as trip legs. For example, walking from the car to the store, walking to the bus stop, or walking to the bike from the restaurant is defined as a trip leg. The following table shows a typical example of how trips and legs are defined.





Trip number	From	To	Leg number	From	To	Mode
1	Home	Work	1	Home	Bus stop	Walking
			2	Waiting at the bus stop		-
			3	Bus stop	Bus stop	Bus
			4	Bus stop	Workplace	Walking
2	Work	Home	1	Workplace	Parking site	Walking
			2	Parking site	Parking site	Car as passenger
			3	Parking site	Home	Walking

b) Horizontal structure

The mobility behaviour of the Islanders is very untypical in comparison to other projects. To meet all demands of the daily life of the Islanders, the interaction between the Mainland and the Islands is crucial. The everyday travel patterns of Islands residents differ. Either they are travelling on the Island or on the Mainland. For a closer look at the Islanders' travel behaviour, the total database is split up into three sub-databases:

- a) Islands trip database: Includes mobility on the Islands. This includes trips where the origin of the trip and the destination of the trip are on one of the Islands. If a trip is a transfer trip, it is split into the part on the island and the rest which is not part of the "Island trip database".
- b) Mainland trip database: Includes mobility on the Mainland. This includes trips where the origin of the trip and the destination of the trip are on the Mainland. If a trip is a transfer trip, it is split into the part on the Mainland and the rest which is not part of the "Mainland trip database". These trips are just including legs done on the Mainland.
- c) Transfer trip database: Includes all the trips which have either the origin at the Island and the destination on the Mainland or vice versa. These trips are not split and include all legs on the Islands, the Mainland and the water.





### 2.3.2 Terminology

The following explanations refer to the terminology used throughout this report:

ACTIVITY	Main business carried out in one spatial setting out of home.
JOURNEY	A sequence of trips starting and ending at home to do one or more activities.
MOBILE PERSONS	Persons undertaking at least one trip during the sampling day.
MODE	See chapter 2.3.3.
PERSONS	All members of the surveyed households.
PARTICIPATION	Usage of a certain "main mode" at the travel day. If one person is using a certain main mode at least for one trip, this person belongs to the respective participation group. If one person is using different main modes at the travel day, this person is belonging to different participation groups.
SPATIAL DISTRIBUTION	Referring to origin and destination, a spatial distribution for all trips can be given. It can be distinguished between <ul style="list-style-type: none"> <li>- trips entirely within one area</li> <li>- trips from one area to another area and vice versa</li> </ul> trips outside one area.
SPEED	Average speed (door-to-door) calculated by distance and duration.
TRIP	Movement generated by an out-of-home activity or trips back home. For one trip more than one mode can be used.
(TRIP) DISTANCE	Door-to-door distance (as reported by the respondent).
(TRIP) DURATION	Calculated (door-to-door) -duration between the start of a trip and the arrival at the destination (as reported by the respondent).
(TRIP) PURPOSE	Reason for conducting a trip; trips back home get the same purpose allocated as trips from home to the corresponding activity.





When activities are described, throughout this report the following classification/definition is used:

EDUCATION	Trips to school including nursery school and further / higher education by full-time students, students on day-release and part-time students following vocational courses.
ESCORT	When the traveller has no purpose other than to escort or accompany another person; for example, taking a child to school.
LEISURE	Visits to meet friends, relatives, or acquaintances, both at someone's home or at a pub, restaurant, etc; religious activities; all types of entertainment or sport, clubs, and non-vocational evening classes; political meetings; recreation; leisure walks; day trips, etc.
PERSONAL BUSINESS	Visits to services: e.g. hairdressers, launderettes, dry-cleaners, betting shops, solicitors, banks, estate agents, libraries, or for medical consultations or treatment.
SHOPPING	All trips to shops or from shops to home, even if there was no intention to buy.
WORK	Trips to usual place of work from home, or work to home and trips to work from a place other than home.
WORK-RELATED BUSINESS	Trips in course of work other than commuting (e.g. business trip, business lunch, attending a conference).





### 2.3.3 Main Mode Definition

Since trips are comprised of several trip legs, different modes can be used on one trip. Out of these trips a main mode is defined by an internationally applied hierarchy. This principle was not applicable in this survey because many modes can be used twice in the same trip on either end of the ferries (e.g. Islanders drive to the ferry by an Island car and from the ferry by a Mainland car).

For this problem a specific survey procedure had to be developed which collated the main mode in a trip leg format capable of differentiating between "same" modes on the Islands and the Mainland within one trip. This design was very successful and this report provides respective results.

However, for many tabulations it would be extremely impractical if a clear main mode could not be defined. A process has therefore been developed which allows the definition of a main mode in a comparable fashion to common mobility surveys.

It follows six steps:

Step one: Combine ferry and barge

Step two: Combine car as driver

Step three: Combine car as passenger

Step four: Combine public transport

Step five: Combine bicycle and motorcycle

Step six: Combine walking

This process is outlined in appendix 2.

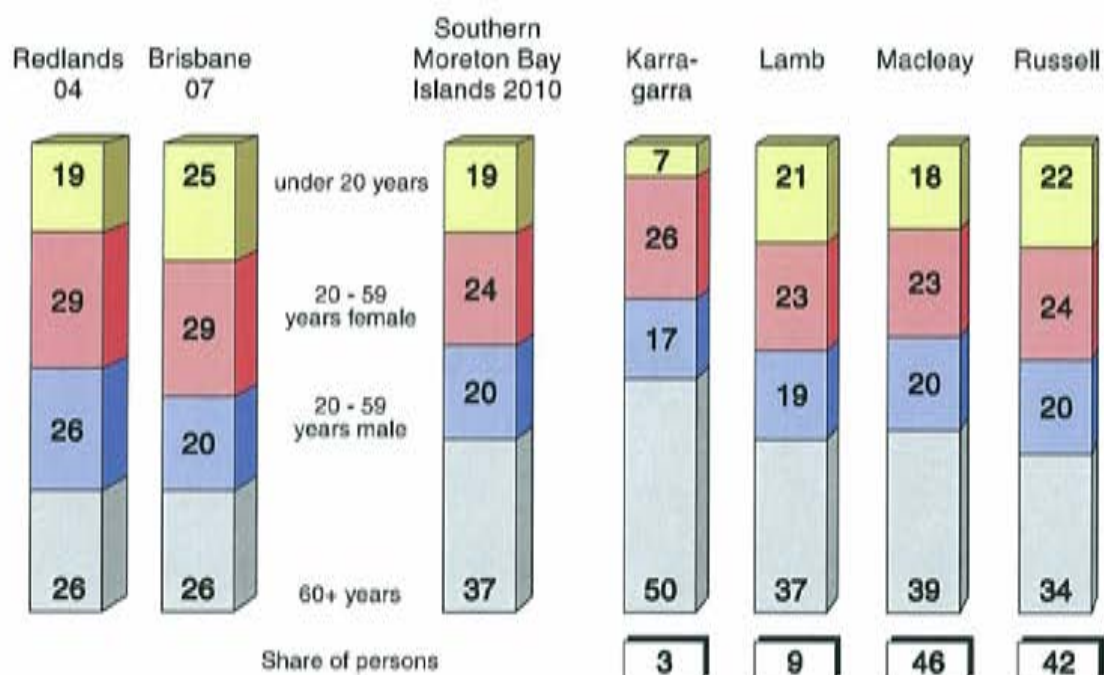




### **3 SUMMARY CHARTS**



## SOCIODEMOGRAPHY

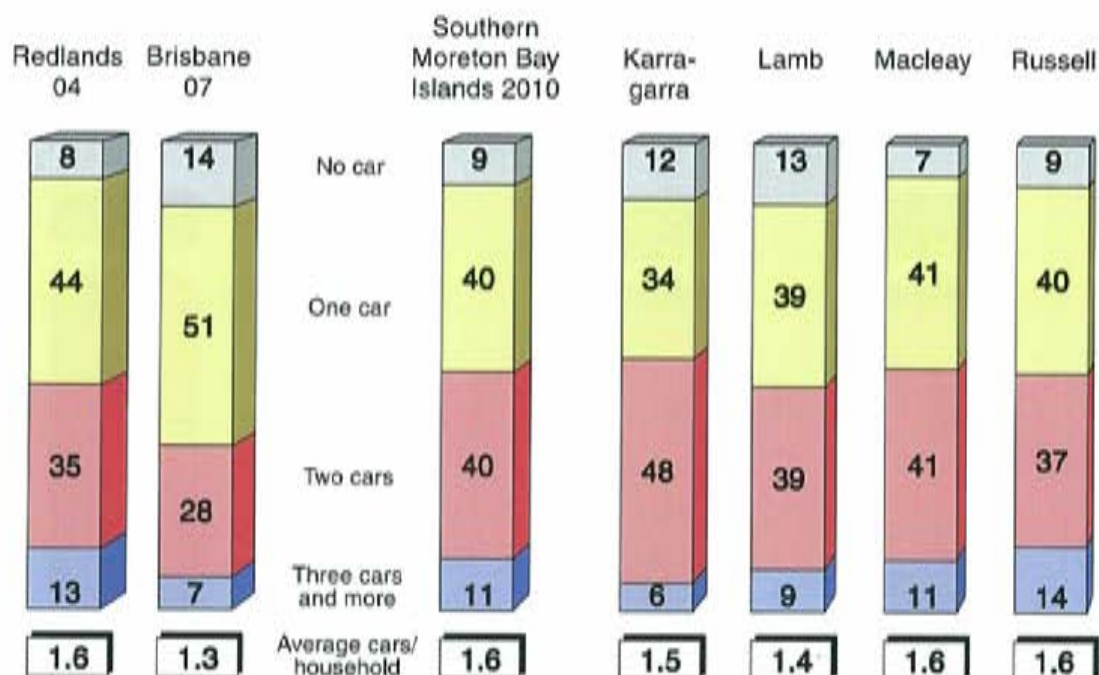


- Islanders are on average older than the population of Brisbane and Redlands County.
- More than one third of Islanders (37 %) are 60 years or older (Brisbane: / Redlands: 26 %); mainly to the expense of the middle age groups.
- On average the youngest population of the Islands lives on Russell and the oldest on Karragarra.





## PRIVATE CARS PER HOUSEHOLD



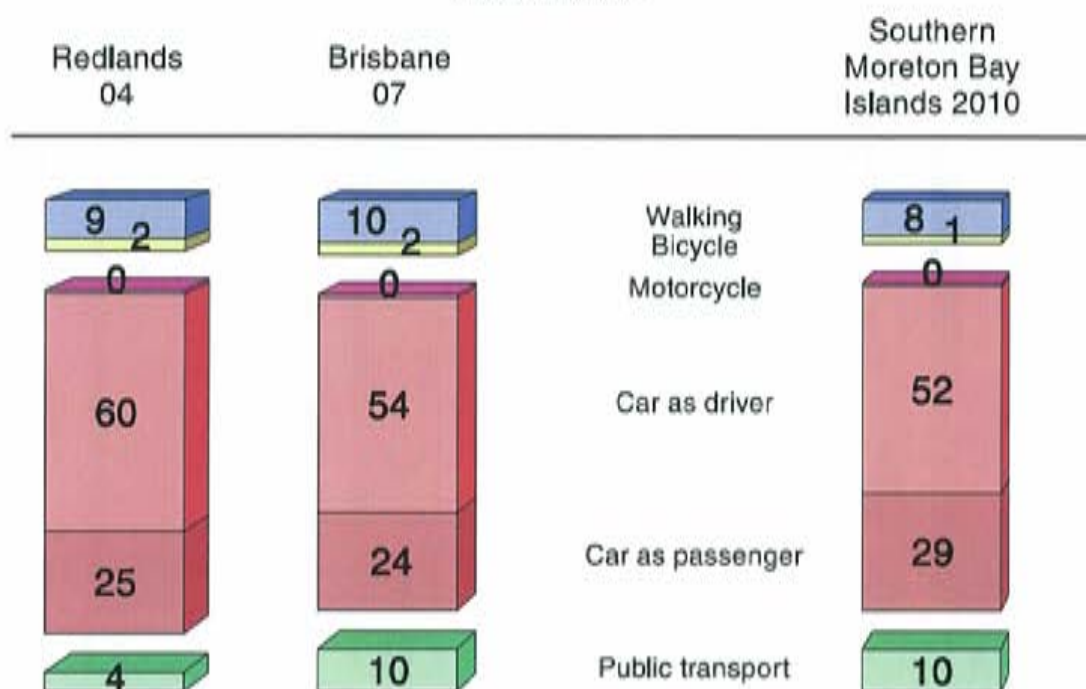
- Car ownership on the Islands is higher than in Brisbane but not higher than in Redlands.
- Only one out of eleven islands households doesn't own a car, 11 % have three cars and more.
- On larger Islands car ownership is slightly higher (1.6) and equals the average for Redlands.





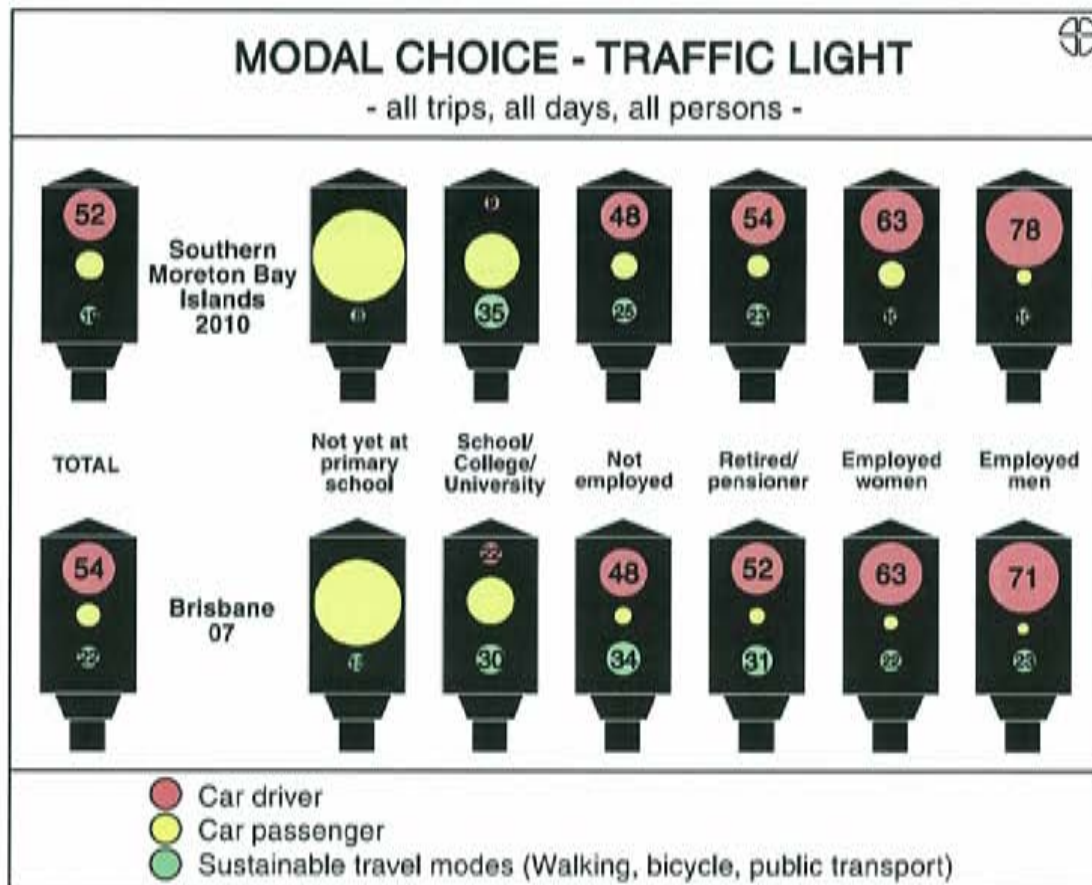
## MODE CHOICE

- Main mode -



- If mode choice is calculated in a comparable fashion to other mobility surveys, the choice of main modes is relatively similar to total Brisbane (with a higher share of car as passenger).
- The car driver share is significantly lower than in Redlands and – slightly – under the Brisbane level.
- The use of alternative modes to the car is about one quarter higher than in Redlands (19 % against 15 %).

















- The share of car drivers is – in comparison to Brisbane – higher on the Islands for employed men and lower for students in school / college / university.
- The share of sustainable travel modes for children is only 8 % (Brisbane 13 %).



## MOBILITY



Redlands 04	Brisbane 07	Per person per day	Southern Moreton Bay Islands 2010
 1.7	 1.8	ACTIVITIES	 1.5
 60'	 61'	TRAVEL TIME (min)	 103'
 2.9	 3.1	TRIPS	 2.5
 32	 25	DISTANCE (km)	 43

- Mobility on the Islands shows less activities and trips as in Brisbane or Redlands.
- However, daily distances (everyday mobility) and travel time exceed the comparative figures by far.





## ACTIVITIES



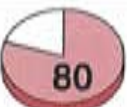




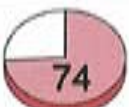




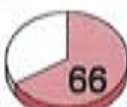




- Islanders have in comparison less mandatory trips (work, work related business, education) and more discretionary trips (shopping, personal business and escort).
- This is a consequence of their age distribution and life situation.





## CAR USAGE



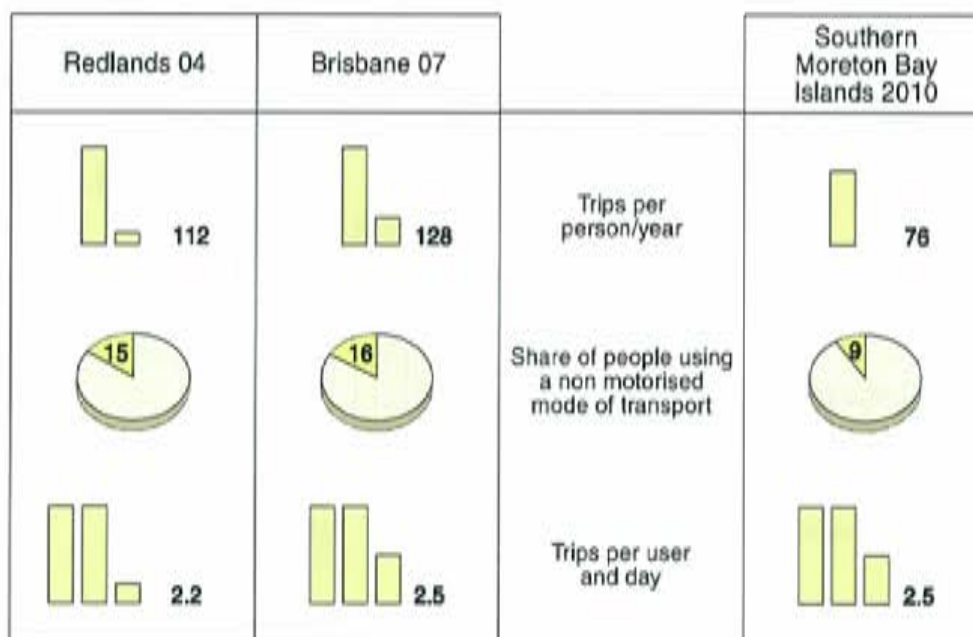
Redlands 04	Brisbane 07	Per (private) car/day	Southern Moreton Bay Islands 2010
    	    	USAGE (%)  TRIPS  DURATION (min)  DISTANCE (km)  OCCUPANCY (per trip)	    

- Two thirds of the average (privately) registered cars on the Islands are in use on an average day.
- Overall they record per day 2.2 trips, a travel time of 49 minutes and a distance travelled (everyday mobility) of 25 km.
- In comparison, car usage and trips per car are lower, car occupancy is higher.





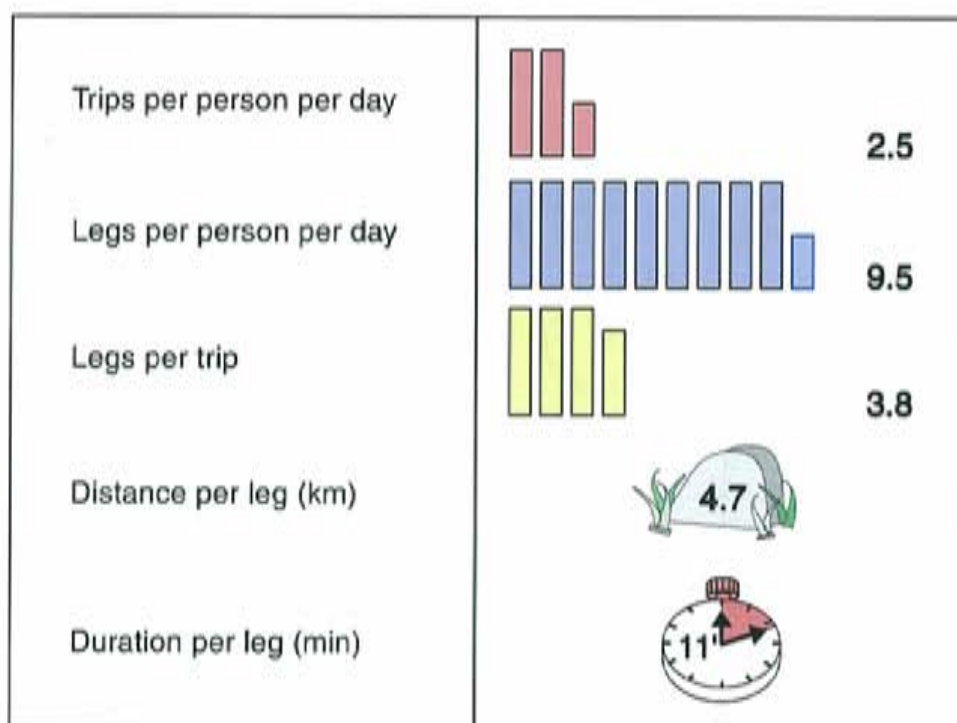
## USE OF NON-MOTORISED MODES OF TRANSPORT



- Only 9 % of Islanders use non-motorised modes on an average day.
- If they do, they record 2.5 of such trips.
- This results in 76 trips with non-motorised modes per person and year (holidays excluded).
- In Brisbane and Redlands the use of non-motorised modes is higher (only because the share of users is nearly two-fold).

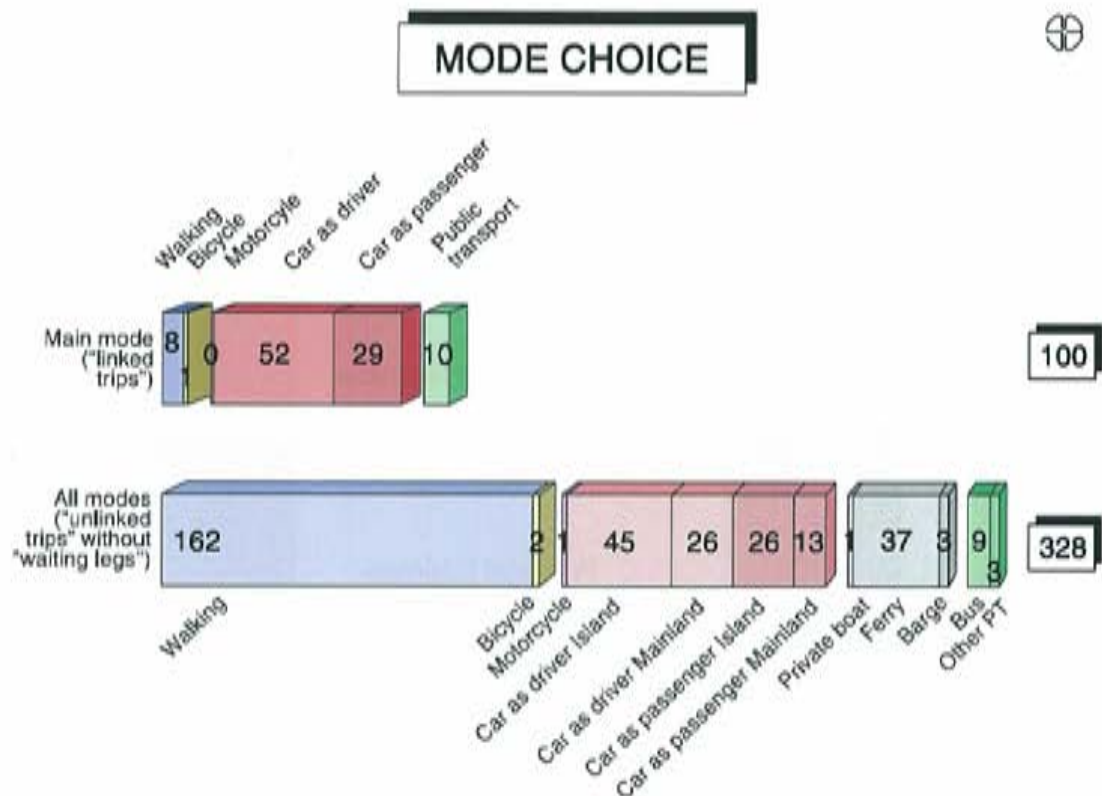


## LEG CHARACTERISTICS



- Islanders register (a record) 3.8 trip legs per trip. This results – on the basis of 2.5 trips per day – in nearly 10 (9.5) daily trip legs.
- The distance per trip leg is long (4.7 km), the duration is rather average (11 min).



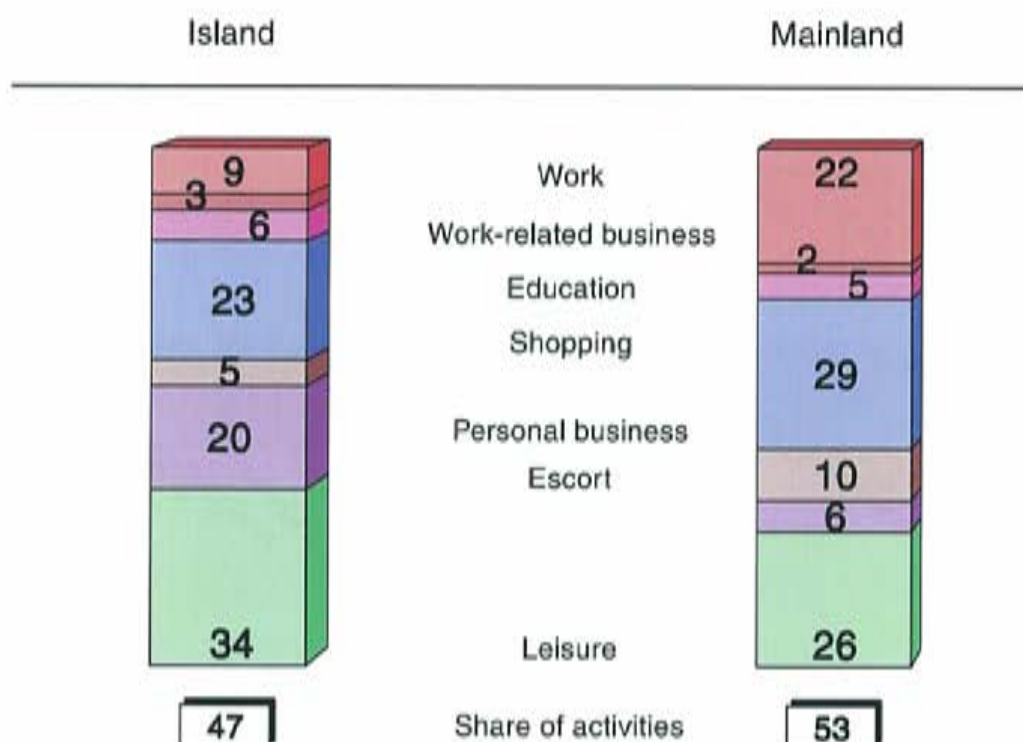


- Each Islander's trip is composed of 3.8 trip legs; if legs for "waiting" are being subtracted, the trip legs where a mode is used are remaining. They account on average for 3.28 (328 %).
- Half of these trip legs (162 %) are on foot. A car as driver is used on the Islands in 45, on the Mainland in 26 % of the cases (car as passenger 26 and 13 %).
- The main "water" mode is ferry (37 %); barge (3 %) and private boat (1 %) have very small shares.





## ACTIVITIES























- Islanders record nearly half of their activities (47 %) on the Islands, the other half (53 %) on the Mainland.
- The share of leisure and – especially – escort is higher on the Islands, shopping and – especially work – are more frequent on the Mainland.



## MOBILITY

- Island -

Southern Moreton Bay 2010	Per person per day	Karragarra	Lamb	Macleay	Russell
 1.2	ACTIVITIES	 1.2	 1.0	 1.2	 1.2
 23'	TRAVEL TIME (min)	 23'	 30'	 23'	 22'
 2.2	TRIPS	 2.4	 2.0	 2.2	 2.2
 5	DISTANCE (km)	 4	 3	 5	 6

- On the Islands, 1.2 activities are recorded per day; 2.2 trips are needed for them. They require 23 minutes and cover a distance of 5 kilometres.
- Differences between the Islands are rather small.





## MODE CHOICE

- Island -

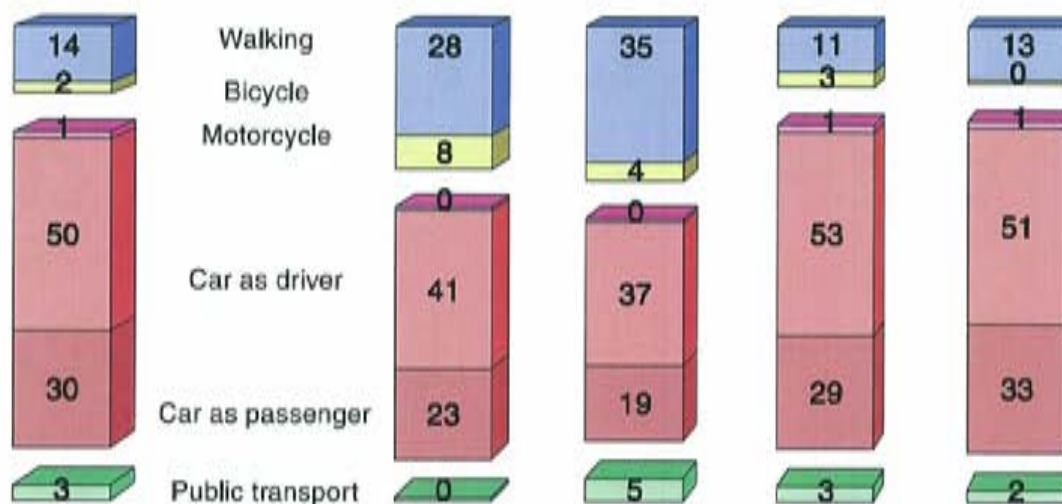
Southern  
Moreton  
Bay 2010

Karragarra

Lamb

Macleay

Russell



- The dominant mode in Island travel is the car (80 % of all trips)
- Car usage is lower on the smaller Islands but exceeds the 50 % mark in every case.
- Walking is low except on Karragarra and – especially – Lamb Islands.



## ISLAND - TRIP LEGS



	Island trips (km)	Island trips (min)
Access to ferry/public transport/car/bicycle	0.1	1
Waiting/changing mode	0	1
Travelling in vehicle	2.3	8
Egress from ferry/public transport/car	0.0	1
<b>Total</b>	<b>2.4</b>	<b>11</b>

- The average Islander's trip covers 2.4 kilometres and takes eleven minutes.
- Nearly all the time and distance can be allocated to their mode; access, egress and waiting figures are small.

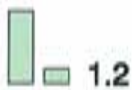
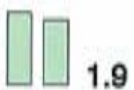
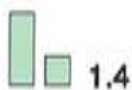

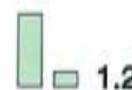









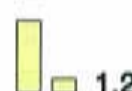









## MOBILITY

- Mainland -



Southern Moreton Bay 2010	Per person per day	Karragarra	Lamb	Macleay	Russell
 1.2	ACTIVITIES	 1.9	 1.4	 1.2	 1.2
 56'	TRAVEL TIME (min)	 54'	 51'	 45'	 45'
 1.2	TRIPS	 1.9	 1.4	 1.2	 1.2
 26	DISTANCE (km)	 33	 29	 27	 24

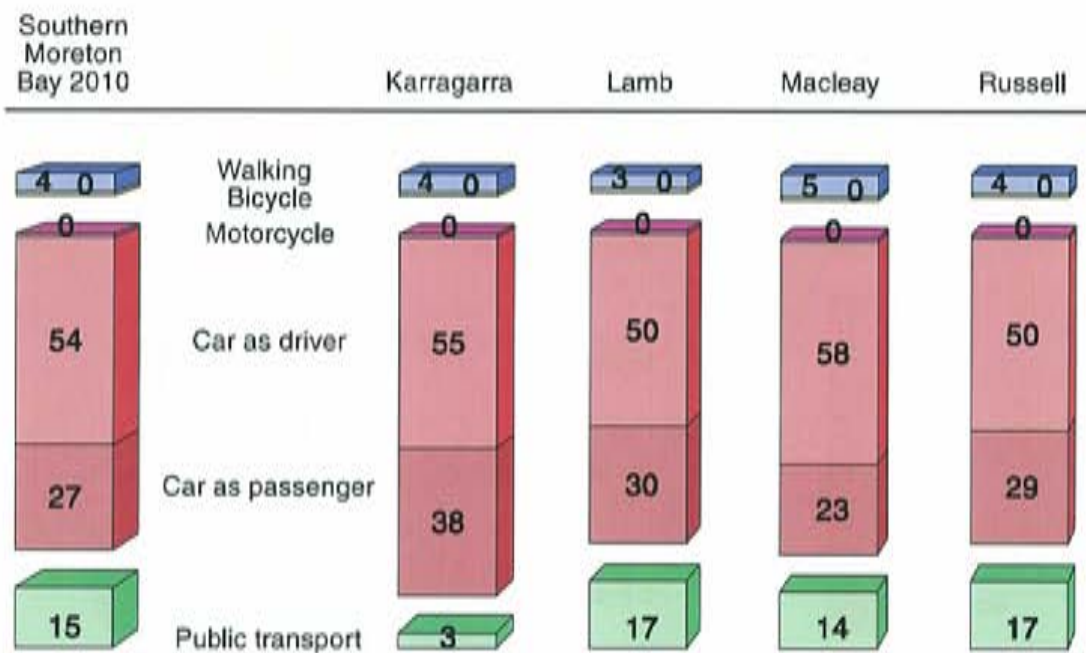
- On the Mainland, each trip ends with an activity (no trips returning home).
- The average number of activities Islanders record on the Mainland (1.2) equals the corresponding figure on the Islands, the number of trips is one trip shorter (see above).
- Distances and travel time on the Mainland are relatively long with Karragarra being above average in activities / trips and distance.





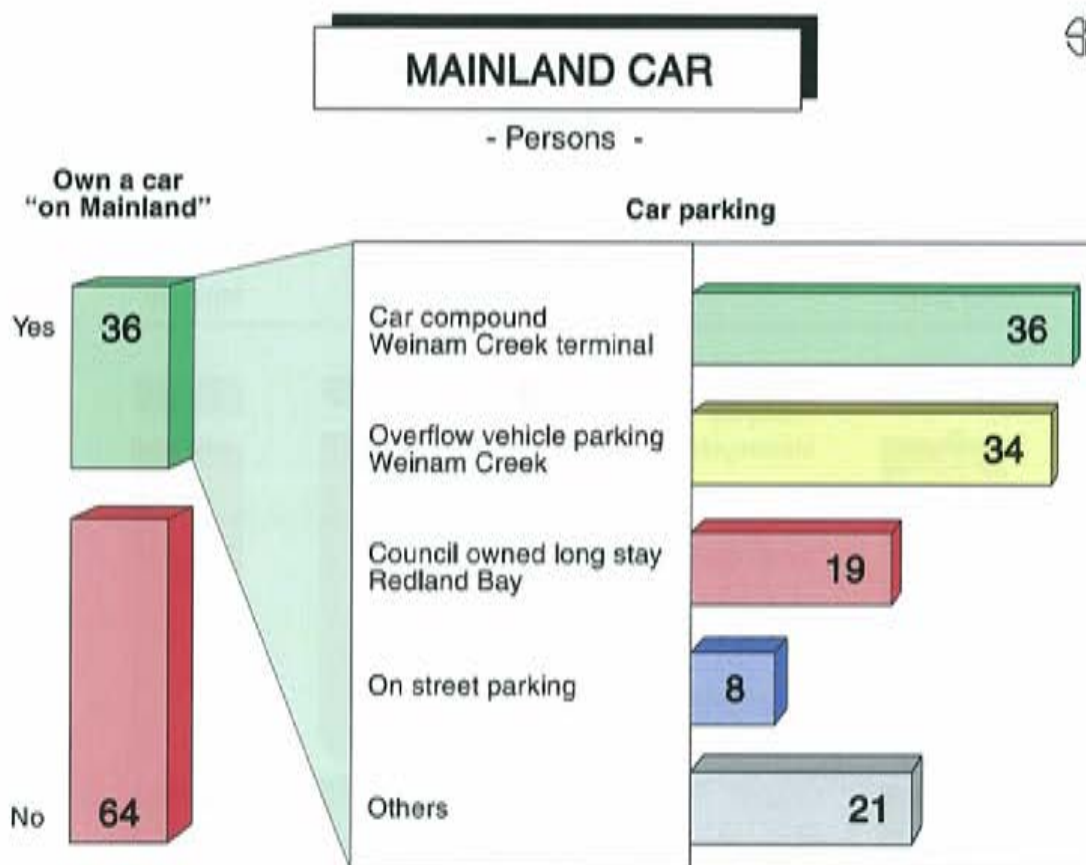
## MODE CHOICE

- Mainland -



- Most of the Mainland trips are made in a car, either as driver (54 %) or as passenger (27 %).
- In every seventh Mainland trip (15 %) a public transport mode is being used.
- Karragarra records over 90 % car trips (55 % as driver and 38 as passenger).





- More than a third of Islanders own a car on the Mainland (36 % of the total population). Out of these a good third either use the car compound at Weinam Creek terminal or the Overflow vehicle park at Weinam Creek.
- The council-owned long-stay parking (Redland Bay) is less frequented (19 %) and on street parking accounts for only 8 %.



**MAINLAND - TRIP LEGS**

	Mainland trips (km)	Mainland trips (min)
Access to ferry/public transport/car/bicycle	0.2	2
Waiting/changing mode	0.1	2
Travelling in vehicle	20.5	31
Egress from ferry/public transport/car	0.2	2
<b>Total</b>	<b>21</b>	<b>37</b>

- Mainland trips of Islanders cover a distance of 21 kilometres and need – on average – 37 minutes.
- A good half hour of the total travel time is spent in the (main) mode; access, egress and waiting need – on average – two minutes each.






















## MOBILITY

- Transfer -



Southern Moreton Bay 2010	Per person per day	Karragarra	Lamb	Macleay	Russell
 80'	TRAVEL TIME (min)	 86'	 88'	 75'	 84'
 1.0	TRIPS	 1.4	 1.0	 0.9	 1.0
 33	DISTANCE (km)	 39	 34	 31	 35

- On average, each Islander registers one transfer trip per day. It takes 80 minutes and covers a distance of 33 kilometres.
- Figures from Karragarra are above, from Macleay (slightly) under average.





## TRANSFER - TRIP LEGS



	Transfer trips (km)	Transfer trips (min)
Access to ferry/public transport/car	0.5	5
Waiting/changing mode	0	14
Travelling on the ferry	10.2	25
Travelling in vehicle	24.1	37
Egress from ferry/public transport/car	0.2	3
<b>Total</b>	<b>35</b>	<b>84</b>

- The analysis of Island's transfer trips shows that access and egress take relatively long (5 and 3 minutes).
- And waiting times register even more (14 minutes).





## MATRIX MODE CHOICE TRANSFER TRIPS



	ISLAND				Total
	Car as driver	Car as passenger	(Just) Walking	Other	
MAINLAND	Car as driver	11%	6%	0%	51
	Car as passenger	21%	2%	1%	26
	Public transport	5%	8%	0%	20
	(Just) Walking	1%	0%	0%	2
	Other	0%	0%	0%	1
	Total	38	16	1	

- Nearly half of the transfer trips (45 %) start on the Islands in a car as driver and 51 % continue as car driver on the Mainland.
- In every third case (34 %) a car is used as driver on the Islands and the Mainland.
- In every fifth transfer trip (21 %) a car as passenger is used at both ends and in every twelfth case people walk to the ferry and continue the trip by using public transport on the Mainland.