

COMPASS

OPTIMISED CO-MODAL PASSENGER TRANSPORT
FOR REDUCING CARBON EMISSIONS

DELIVERABLE D6.1

USER RESPONSE TO SUGGESTED ICT SOLUTIONS

Due Date: 31 March 2013
Submitted: 7 November 2013
Main Author: University of Gdansk
Dissemination: Public



Project co-funded by the European Commission within the Seventh Framework Programme, Theme 7 Transport
Contract number 284722
Project Start Date: 1 November 2011, Project Duration: 25 months

Document Control Sheet

Contract Number:	284722		
Project Acronym:	COMPASS		
Workpackage:	WP 6 Assessment		
Version:	V1.0		
Document History:	Version	Issue Date	Distribution
	V0.1	9 September 2013	Consortium
	V1.0	7 November 2013	Consortium / Project Officer / Public

Classification – This report is:									
Draft		Final	X	Confidential		Restricted		Public	X

Partners Owning:	All
Main Editor:	Monika Bak (UG)
Partners Contributed:	Przemyslaw Borkowski (UG), Bryan Matthews, Mark Wardman (ITS), Oriol Biosca, Andreu Ulled, Marta Calvet, Judith Requena (MCRIT), Helmut Lemmerer, Takeru Shibayama, Manuela Winder (TUW)
Made Available To:	Public
This document should be referenced as:	Bak M., Borkowski P, Matthews B., Wardman M., Biosca O., Ulled A., Calvet M., Requena J., Lemmerer H., Shibayama T., Winder M., %user response to suggested ICT solutions+, Deliverable 6.1 of COMPASS, Co-funded by FP7. TRI, Edinburgh Napier University, Edinburgh, September 2013

This document was created as part of the COMPASS project.
All information is public and we encourage the use.

Copyright (c) 2013

Copyleft: Permission is granted to copy, distribute and/or use this document under the terms of the Free Documentation Dissemination License, Version 1, available at <http://pauillac.inria.fr/~lang/licence/v1/fddl.html>

ORIGAMI Project Office

Transport Research Institute
Edinburgh Napier University
Edinburgh, UK
Tel: + 44 131 455 2635
e-mail: H.Condie@napier.ac.uk
Web: www.origami-project.eu

TABLE OF CONTENTS

EXECUTIVE SUMMARY	1
1 INTRODUCTION	2
1.1 A SURVEY APPROACH TO CASE STUDIES.....	2
1.2 SURVEY METHODOLOGIES	2
2 SURVEY FOR CASE STUDY 3 – ACCESSIBILITY APPLICATIONS FOR DISABLED PEOPLE	5
2.1 EXECUTIVE SUMMARY OF THE SURVEY	5
2.2 SURVEY CHARACTERISTICS.....	5
2.2.1 <i>Survey Methodology</i>	5
2.2.2 <i>Geographical Area Covered by the Survey Research</i>	6
2.2.3 <i>Respondents</i>	6
2.2.4 <i>Solutions Considered</i>	8
2.3 RESULTS.....	10
3 SURVEY FOR CASE STUDY 4 - ITS SOLUTIONS FOR BARCELONA'S LOCAL BUS NETWORK.....	19
3.1 EXECUTIVE SUMMARY OF THE SURVEY	19
3.2 SURVEY CHARACTERISTICS.....	19
3.2.1 <i>Survey Methodology</i>	19
3.2.2 <i>Geographical Area Covered by the Survey Research</i>	21
3.2.3 <i>Respondents</i>	26
3.2.4 <i>Solutions Considered</i>	30
3.3 RESULTS.....	31
3.3.1 <i>About the Bus Network Restructuration and Optimisation in Barcelona</i>	31
3.3.2 <i>About the TMB Smart Phone Application</i>	31
3.3.3 <i>About the Service of the Neighbourhood Bus</i>	32
3.3.4 <i>Willingness to Pay for Smart Phone Applications</i>	33
3.4 ANNEX: PICTURES.....	36
4 SURVEY 1 FOR CASE STUDY 5 – FUTURE INTERURBAN PUBLIC TRANSPORT IN WARMINSKO-MAZURSKIE VOIVODSHIP	38
4.1 EXECUTIVE SUMMARY OF THE SURVEY	38
4.2 SURVEY CHARACTERISTICS.....	38
4.2.1 <i>Survey Methodology</i>	38
4.2.2 <i>Geographical Area Covered by the Survey Research</i>	38
4.2.3 <i>Respondents</i>	39
4.2.4 <i>Solutions Considered</i>	40
4.3 RESULTS.....	40
4.3.1 <i>Internet or Mobile Phone Based Travel Planners</i>	40
4.3.2 <i>Electronic Real-time Information at Bus Stops</i>	42
4.3.3 <i>Ticket Purchasing via Mobile Phone/Internet</i>	44
4.3.4 <i>Real-time Information on Services via Mobile Phone/Internet</i>	46
4.3.5 <i>Real-Time Information on Services on Board of Vehicles</i>	47
4.3.6 <i>Demand Responsive Services</i>	49
5 SURVEY 2 FOR CASE STUDY 5 – FUTURE INTERURBAN PUBLIC TRANSPORT IN WARMINSKO-MAZURSKIE VOIVODSHIP	52
5.1 EXECUTIVE SUMMARY OF THE SURVEY	52
5.2 SURVEY CHARACTERISTICS.....	52
5.2.1 <i>Survey Methodology</i>	52
5.2.2 <i>Geographical Area Covered by the Survey Research</i>	53
5.2.3 <i>Respondents</i>	54
5.2.4 <i>Solutions Considered</i>	54
5.3 RESULTS.....	54

TABLE OF CONTENTS (Continued)

5.3.1	<i>Internet or Mobile Phone Based Travel Planners</i>	54
5.3.2	<i>Electronic Real-Time Information at Bus Stops</i>	54
5.3.3	<i>Ticket Purchasing via Mobile Phone/Internet</i>	55
5.3.4	<i>Real-time Information on Services via Mobile Phone/Internet</i>	55
5.3.5	<i>Real-Time Information on Services on Board of Vehicles</i>	56
5.3.6	<i>Demand Responsive Services</i>	56
5.3.7	<i>Consultation with the Stakeholder – Public Transport Provider</i>	57
6	SURVEY FOR CASE STUDY 7 - BIKE-SHARING IN VIENNA AND THE SURROUNDING REGION	58
6.1	EXECUTIVE SUMMARY OF THE SURVEY	58
6.2	SURVEY CHARACTERISTICS	58
6.2.1	<i>Survey Methodology</i>	58
6.2.2	<i>Geographical Area Covered by the Survey Research</i>	58
6.2.3	<i>Respondents</i>	59
6.2.4	<i>Solutions Considered</i>	63
6.3	RESULTS	63
6.3.1	<i>Introduction</i>	63
6.3.2	<i>Bicycle Ownership and Usage in General</i>	63
6.3.3	<i>Respondents' Background Related to ICTs</i>	65
6.3.4	<i>Awareness and Usage Experience of Bike-Sharing Schemes</i>	67
6.3.5	<i>Response from Users to the Bike-Sharing in General</i>	71
6.3.6	<i>User Response to Identification, Authorisation and Payment Method</i>	72
6.3.7	<i>Response from Non-Users to the Bike-Sharing in General</i>	74
7	SURVEY 1 FOR CASE STUDY 9 - GRASS-ROOT COOPERATIVE SMARTPHONE-BASED CAR-SHARING	76
7.1	EXECUTIVE SUMMARY OF THE SURVEY	76
7.2	SURVEY CHARACTERISTICS	76
7.2.1	<i>Survey Methodology</i>	76
7.2.2	<i>Geographical Area Covered by the Survey Research</i>	77
7.2.3	<i>Respondents</i>	77
7.2.4	<i>Solutions Considered</i>	78
7.3	RESULTS	78
7.3.1	<i>General Findings</i>	78
7.3.2	<i>Founding of the Car-Sharing Groups</i>	79
7.3.3	<i>Motivation for Car-Sharing</i>	79
7.3.4	<i>Location and Usage of the Car-Sharing Car</i>	80
7.3.5	<i>Advantages of Car-Sharing</i>	80
7.3.6	<i>Disadvantages of Car-Sharing</i>	81
7.3.7	<i>Detailed List of Findings</i>	82
8	SURVEY 2 FOR CASE STUDY 9 - GRASS-ROOT COOPERATIVE SMARTPHONE-BASED CAR-SHARING	93
8.1	EXECUTIVE SUMMARY OF THE SURVEY	93
8.2	SURVEY CHARACTERISTICS	93
8.2.1	<i>Survey Methodology</i>	93
8.2.2	<i>Geographical Area Covered by the Survey Research</i>	94
8.2.3	<i>Respondents</i>	94
8.2.4	<i>Solutions Considered</i>	94
8.3	RESULTS	95
8.3.1	<i>Introduction</i>	95
8.3.2	<i>User Profile in General</i>	95
8.3.3	<i>User Profile Related to Mobility</i>	98
8.3.4	<i>User's Experiences with ICT Applications</i>	101
8.3.5	<i>Motivation to Start Car-Sharing</i>	103
8.3.6	<i>Usages of Car-Sharing Cars</i>	108

TABLE OF CONTENTS (Continued)

8.3.7	Change in Travel Behaviour	113
9	SURVEY 3 FOR CASE STUDY 9 - GRASS-ROOT COOPERATIVE SMARTPHONE-BASED CAR-SHARING	116
9.1	EXECUTIVE SUMMARY OF THE SURVEY	116
9.2	SURVEY CHARACTERISTICS	116
9.2.1	Survey Methodology	116
9.2.2	Geographical Area Covered by the Survey Research	116
9.2.3	Respondents	118
9.2.4	Solutions Considered	121
9.3	RESULTS	121
9.3.1	Publicity of the Term Car-Sharing	121
9.3.2	Usage of a Car-Sharing Offer	122
9.3.3	Respondents' Experiences with ICT	123
10	CONCLUSIONS	124
11	REFERENCES	132
12	APPENDIX - QUESTIONNAIRES	2
12.1	QUESTIONNAIRES FOR CASE STUDY 3 SURVEY - ACCESSIBILITY APPLICATIONS FOR DISABLED PEOPLE	2
12.2	QUESTIONNAIRES FOR CASE STUDY 4 SURVEY- ITS SOLUTIONS FOR BARCELONA'S LOCAL BUS NETWORK	14
12.3	QUESTIONNAIRES FOR CASE STUDY 5 SURVEY- FUTURE INTERURBAN PUBLIC TRANSPORT IN WARMINSKO-MAZURSKIE VOIVODSHIP	18
12.3.1	Quantitative survey	18
12.3.2	Qualitative survey – focus groups	21
12.4	QUESTIONNAIRES FOR CASE STUDY 8 SURVEY . BIKE-SHARING IN VIENNA AND THE SURROUNDING REGION	23
12.5	QUESTIONNAIRES FOR CASE STUDY 10 SURVEY - GRASS-ROOT COOPERATIVE SMARTPHONE BASED CAR SHARING	29
12.5.1	Focus Group Interview	29
12.5.2	On-line survey for users	29
12.5.3	Telephone survey for users and non-users	39

LIST OF FIGURES

FIGURE 3-1	SURVEYING POINTS AT PASSEIG DE LES AIGÜES, BARCELONA	20
FIGURE 3-2	PASSEIG DE LES AIGÜES+AND MOUNTAIN NEIGHBOURHOODS WITHIN THE BARCELONA MUNICIPALITY. GEOGRAPHIC COVERAGE	21
FIGURE 3-3	POPULATION OF MOUNTAIN NEIGHBOURHOODS OF BARCELONA	22
FIGURE 3-4	METRO LINES AND RAIL LINES SERVING THE MOUNTAIN NEIGHBOURHOODS	23
FIGURE 3-5	MAJOR ROAD AXES PROVIDING ACCESS TO MOUNTAIN NEIGHBOURHOODS (IN BLUE RING ROAD)	23
FIGURE 3-6	VIEW OF A CANYELLES NEIGHBOURHOOD IN BARCELONA, AND BUS STOP IN THE MOUNTAIN NEIGHBOURHOODS OF BARCELONA	24
FIGURE 3-7	BARCELONA POPULATION DENSITIES BY NEIGHBOURHOODS 2011	25
FIGURE 3-8	AGEING AT BARCELONA NEIGHBOURHOODS, 2009	25
FIGURE 3-9	AVAILABLE FAMILY INCOME AT MOUNTAIN NEIGHBOURHOODS (BARCELONA AVERAGE =100)	26
FIGURE 3-10	TYPE OF RESPONDENTS BY ACTIVITY (CS4 SURVEY)	26
FIGURE 3-11	SEX OF THE PATHWAY USERS BY TYPE OF RESPONDENT: BIKERS (LEFT), PEDESTRIANS (MIDDLE) AND TOTAL RESPONDENTS (RIGHT) (CS4 SURVEY)	27
FIGURE 3-12	AGE BY TYPE OF RESPONDENT: BIKERS (LEFT), PEDESTRIANS (CENTRE) AND AVERAGE (RIGHT) (CS4 SURVEY)	27
FIGURE 3-13	TYPE OF GROUP BY TYPE OF RESPONDENTS: BIKERS (LEFT), PEDESTRIANS (MIDDLE) AND TOTAL RESPONDENTS (RIGHT) (CS4 SURVEY)	28

TABLE OF CONTENTS (Continued)

FIGURE 3-14 TRIP PURPOSE BY TYPE OF RESPONDENT: BIKERS (LEFT), PEDESTRIANS (MIDDLE) AND TOTAL RESPONDENTS (RIGHT) (CS4 SURVEY)	28
FIGURE 3-15 ORIGIN OF TRIP BY TYPE OF RESPONDENT: BIKERS (LEFT), PEDESTRIANS (MIDDLE) AND TOTAL RESPONDENTS (RIGHT) (CS4 SURVEY)	29
FIGURE 3-16 ORIGIN OF THE TRIP FOR BIKERS (LEFT) AND PEDESTRIANS (RIGHT) (CS4 SURVEY)	29
FIGURE 3-17 MODAL SPLIT OF ACCESS TRIPS, BY RESPONDENTS TYPE: BIKERS (LEFT), PEDESTRIANS (MIDDLE) AND AVERAGE (RIGHT) (CS4 SURVEY)	30
FIGURE 3-18 PARK SPACE, FOR RESPONDENTS ACCESSING BY CAR (CS4 SURVEY).....	30
FIGURE 3-19 AWARENESS OF BUS RESTRUCTURATION AND OPTIMISATION IN BARCELONA. TOTAL USERS RESPONDENTS (LEFT), PUBLIC TRANSPORT REGULAR USERS RESPONDENTS (MIDDLE), OTHER TRANSPORT MODES RESPONDENTS (RIGHT) (CS4 SURVEY)	31
FIGURE 3-20 AWARENESS OF TMB SMART PHONE APPLICATIONS. RESPONDENTS WHO KNOW SMART PHONE APPLICATIONS BY TMB THAT PROVIDES REAL-TIME INFORMATION BY TYPE OF USER: TOTAL RESPONDENTS (LEFT), PUBLIC TRANSPORT REGULAR USER (MIDDLE), NO PUBLIC TRANSPORT REGULAR USERS (RIGHT) (CS4 SURVEY).....	32
FIGURE 3-21 USE OF TMB SMART PHONE APPLICATION. RESPONDENTS WHO USES REGULARLY THE TMB SMART PHONE APPLICATION BY TYPE OF RESPONDENT: BIKERS (LEFT), PEDESTRIANS (MIDDLE) AND TOTAL RESPONDENTS (RIGHT) (CS4 SURVEY)	32
FIGURE 3-22 AWARENESS OF THE %NEIGHBOURHOOD BUS+SERVICE OFFERED BY TMB (CS4 SURVEY)	33
FIGURE 3-23 WILLINGNESS TO PAY INFORMATION AND SECURITY APPLICATION: BIKERS RESPONDENTS (LEFT), PEDESTRIANS RESPONDENTS (MIDDLE) AND TOTAL RESPONDENTS (RIGHT) (CS4 SURVEY)	33
FIGURE 3-24 WILLINGNESS TO PAY FOR A DEMAND RESPONSIVE TRANSPORT SERVICE FROM BARCELONA TO PASSIEG DE LES AIGÜES: BIKERS (LEFT), PEDESTRIANS (MIDDLE) AND TOTAL RESPONDENTS (RIGHT) (CS4 SURVEY)	34
FIGURE 3-25 WILLINGNESS TO PAY FOR A DEMAND RESPONSIVE TRANSPORT SERVICE FROM DIFFERENT AREAS OF THE TIBIDABO MOUNTAIN TO THE CLOSEST RAIL OR METRO STATION: BIKERS (LEFT), PEDESTRIANS (MIDDLE) AND TOTAL RESPONDENTS (RIGHT) (CS4 SURVEY)	34
FIGURE 3-26 WILLINGNESS TO USE A MOUNTAIN BIKE SHARING SYSTEM (CS4 SURVEY).....	35
FIGURE 3-27 WILLINGNESS TO PAY TO BOOK A PARKING SPACE USING SMART PHONE APPLICATION (CS4 SURVEY)	35
FIGURE 3-28 TYPICAL STEEP AND NARROW STREETS IN BARCELONA'S MOUNTAIN NEIGHBOURHOODS (I)	36
FIGURE 3-29 TYPICAL STEEP AND NARROW STREETS IN BARCELONA'S MOUNTAIN NEIGHBOURHOODS (II)	36
FIGURE 3-30 TYPICAL STEEP AND NARROW STREETS IN BARCELONA'S MOUNTAIN NEIGHBOURHOODS (III)	37
FIGURE 3-31 SURVEYING CAMPAIGN IN %PASSEIG DE LES AIGÜES+.....	37
FIGURE 4-1 SZCZYTNO REGION IN THE NORTH-EASTERN PART OF POLAND	39
FIGURE 5-1 SZCZYTNO REGION IN THE NORTH-EASTERN PART OF POLAND.	53
FIGURE 6-1 GENDER OF THE RESPONDENTS AND IN THE STUDY AREA (CS7 SURVEY)	60
FIGURE 6-2 AGE DISTRIBUTION OF THE RESPONDENTS (CS7 SURVEY)	61
FIGURE 6-3 HIGHEST EDUCATION OF THE RESPONDENTS AND RESIDENTS IN THE STUDY AREA	62
FIGURE 6-4 HOUSEHOLD SIZE IN THE STUDY AREA (CS7 SURVEY)	63
FIGURE 6-5 BICYCLE OWNERSHIP OF THE RESPONDENTS AND RESIDENTS IN THE STUDY AREA.....	64
FIGURE 6-6 BICYCLE USAGES OF THE RESPONDENTS (CS7 SURVEY)	65
FIGURE 6-7 RESPONDENTS' FAMILIARITY WITH INTERNET-BASED SERVICES (CS7 SURVEY)	65
FIGURE 6-8 RESPONDENTS' ACCEPTANCE OF TICKET ORIENTED SOLUTIONS (CS7 SURVEY)	66
FIGURE 6-9 RESPONDENTS' USAGE OF TRAVEL PLANNERS (CS7 SURVEY).....	67
FIGURE 6-10 RESPONDENTS' AWARENESS OF BIKE-SHARING SCHEMES IN THE STUDY AREA (CS7 SURVEY) ..	68
FIGURE 6-11 RESPONDENTS' SOURCE OF KNOWLEDGE ABOUT BIKE-SHARING (CS7 SURVEY).....	69
FIGURE 6-12 RESPONDENTS' EXPERIENCES OF BIKE SHARING IN THE STUDY AREA (CS7 SURVEY)	69
FIGURE 6-13 PERCENTAGES OF LOWER AUSTRIANS WITH USAGE EXPERIENCE OF LOWER AUSTRIAN SYSTEM IN 2009 AND 2013 (CS7 SURVEY).....	70
FIGURE 6-14 USAGE FREQUENCY OF BIKE-SHARING SCHEMES (CS7 SURVEY)	70
FIGURE 6-15 MOST TYPICAL TRIP PURPOSE WITH SHARED BIKES REPORTED BY RESPONDENTS (CS7 SURVEY)	71
FIGURE 6-16 RESPONDENTS' OPINION ABOUT ADVANTAGES OF BIKE-SHARING (CS7 SURVEY)	71
FIGURE 6-17 RESPONDENTS' WILLINGNESS TO PAY (CS7 SURVEY)	72
FIGURE 6-18 RESPONDENTS' PREFERENCE FOR BOOKING AND IDENTIFICATION METHODS (CS7 SURVEY).....	73
FIGURE 6-19 USER PREFERENCE OF PAYMENT METHOD (CS7 SURVEY)	73

TABLE OF CONTENTS (Continued)

FIGURE 6-20 RESPONDENTS' PERCEPTION OF POTENTIAL NEW DEVELOPMENTS (CS7 SURVEY).....	74
FIGURE 6-21 WILLINGNESS TO USE AMONG NON-USERS (CS7 SURVEY)	75
FIGURE 6-22 NON-USERS' REQUIREMENTS TO USE BIKE-SHARING (CS7 SURVEY)	75
FIGURE 7-1 CS9 SURVEY AREA.....	77
FIGURE 8-1 GENDER RATIO IN WEB-BASED CS 9 SURVEY.....	95
FIGURE 8-2 AGE DISTRIBUTION OF THE RESPONDENTS TO THE WEB-BASED CS 9 SURVEY	96
FIGURE 8-3 HOUSING LOCATION OF THE RESPONDENTS IN WEB-BASED CS9 SURVEY BASED ON THEIR SELF ASSESSMENT	96
FIGURE 8-4 EDUCATION LEVEL IN WEB-BASED CS9 SURVEY	97
FIGURE 8-5 OCCUPATION IN WEB-BASED CS9 SURVEY	98
FIGURE 8-6 CAR OWNERSHIP OF THE RESPONDENTS TO WEB-BASED CS9 SURVEY	98
FIGURE 8-7 USAGE FREQUENCY OF CARS OF THE RESPONDENTS TO WEB-BASED CS9 SURVEY	99
FIGURE 8-8 ACCESS TO OTHER PERSON'S CAR REPORTED BY THE RESPONDENTS TO WEB-BASED CS9 SURVEY	99
FIGURE 8-9 PREFERENCES IN WEB-BASED CS9 SURVEY	100
FIGURE 8-10 USE OF PUBLIC TRANSPORT USAGE REPORTED BY THE RESPONDENTS TO WEB-BASED CS9 SURVEY.....	100
FIGURE 8-11 POSSESSION OF PUBLIC TRANSPORT SEASONAL TICKET BY RESPONDENTS TO WEB-BASED CS9 SURVEY.....	101
FIGURE 8-12. SELF-ASSESSMENT OF THE EXPERIENCES WITH THE INTERNET BY THE RESPONDENTS TO WEB- BASED CS9 SURVEY	101
FIGURE 8-13 USE OF ON-LINE TRAVEL PLANNER AS PER RESPONSES IN WEB-BASED CS9 SURVEY	102
FIGURE 8-14 DIGITAL MEDIA AVAILABILITY OF THE RESPONDENTS TO WEB-BASED CS9 SURVEY	102
FIGURE 8-15 ELECTRONIC EQUIPMENT USE FOR BOOKING PURPOSES AS PER RESPONSES IN WEB-BASED CS9 SURVEY.....	103
FIGURE 8-16 REASONS FOR USING CAR-SHARING SCHEMES AS PER RESPONSES IN WEB-BASED CS9 SURVEY	104
FIGURE 8-17 REASONS FOR USING CAR-SHARING SCHEMES AS PER RESPONSES IN WEB-BASED CS9 SURVEY	105
FIGURE 8-18. USER PREFERENCES REGARDING CAR TYPE AS PER RESPONSES IN WEB-BASED CS9 SURVEY	105
FIGURE 8-19 REASONS FOR USING CAR-SHARING SCHEMES AS PER RESPONSES IN WEB-BASED CS9 SURVEY	107
FIGURE 8-20 CHANGES TO RESPONDENTS' OWN VEHICLES AFTER STARTING CAR-SHARING AS REPORTED IN WEB-BASED CS9 SURVEY	108
FIGURE 8-21 DISTRIBUTION OF TRIP PURPOSES WITH SHARED CARS AS REPORTED IN WEB-BASED CS9 SURVEY.....	109
FIGURE 8-22 DISTRIBUTION OF TRAVEL DISTANCES COVERED WITH CAR. SHARING CARS AS REPORTED IN WEB- BASED CS9 SURVEY	110
FIGURE 8-23 DISTRIBUTION BETWEEN WEEKDAY AND WEEKEND AS REPORTED IN WEB-BASED CS9 SURVEY	110
FIGURE 8-24. DISTRIBUTION OF HOURS AS REPORTED IN WEB-BASED CS9 SURVEY	111
FIGURE 8-25 CAR OCCUPANCY RATES IN CAR-SHARING AS REPORTED IN WEB-BASED CS9 SURVEY	111
FIGURE 8-26 CARRIED LUGGAGE IN CAR-SHARING AS PER REPORTED IN WEB-BASED CS9 SURVEY	112
FIGURE 8-27 ALTERNATIVES WHEN CAR-SHARING CAR IS NOT AVAILABLE AS RESPONDED IN WEB-BASED CS9 SURVEY.....	113
FIGURE 28 RESPONDENTS' SELF-ASSESSMENT ABOUT THE CHANGES SINCE STARTING CAR-SHARING AS REPORTED IN WEB-BASED CS9 SURVEY.....	114
FIGURE 29 RESPONDENTS' SELF-ASSESSMENT ABOUT CHANGES SINCE STARTING CAR-SHARING SCHEMES AS PER RESPONSES IN WEB-BASED CS9 SURVEY	115
FIGURE 9-1 AREA COVERAGE OF THE TELEPHONE BASED CS9 SURVEY.....	118
FIGURE 9-2 GENDER RATIO IN THE TELEPHONE BASED CS9 SURVEY	119
FIGURE 9-3 RESPONDENTS' AGE DISTRIBUTION IN THE TELEPHONE BASED CS9 SURVEY.....	119
FIGURE 9-4. HIGHEST EDUCATION OF THE RESPONDENTS TO THE TELEPHONE BASED CS9 SURVEY	120
FIGURE 9-5 OCCUPATION OF THE RESPONDENTS TO THE TELEPHONE BASED CS9 SURVEY	120
FIGURE 9-6 PUBLIC TRANSPORT USE AMONG RESPONDENTS TO THE TELEPHONE BASED CS9 SURVEY	121

TABLE OF CONTENTS (Continued)

FIGURE 9-7 RESPONDENTS' FAMILIARITY WITH CAR-SHARING AS PER RESULTS OF THE TELEPHONE BASED CS9 SURVEY.....	122
FIGURE 9-8 REASONS OF NON-USE OF CAR-SHARING AS PER RESULTS OF THE TELEPHONE BASED CS9 SURVEY.....	122
FIGURE 9-9 DIGITAL EQUIPMENT AVAILABILITY AS PER RESULTS OF THE TELEPHONE BASED CS9 SURVEY ...	123

LIST OF TABLES

TABLE 2-1 TYPES OF IMPAIRMENT (CS3 SURVEY).....	6
TABLE 2-2 GENDER (CS3 SURVEY).....	6
TABLE 2-3 AGE GROUP (CS3 SURVEY).....	7
TABLE 2-4 EMPLOYMENT STATUS (CS3 SURVEY).....	7
TABLE 2-5 INCOME CATEGORIES (CS3 SURVEY).....	7
TABLE 2-6 DOES YOUR PHYSICAL MOBILITY FLUCTUATE SIGNIFICANTLY FROM ONE DAY TO THE NEXT? (CS3 SURVEY).....	7
TABLE 2-7 ON A GOOD DAY, APPROXIMATELY HOW FAR CAN YOU COMFORTABLY WALK WITHOUT NEEDING TO TAKE A REST? (CS3 SURVEY).....	8
TABLE 2-8 ATTRIBUTES AND LEVELS IN THE SP EXERCISE (CS3 SURVEY).....	9
TABLE 2-9 HOW DOES YOUR PHYSICAL MOBILITY IMPAIRMENT AFFECT YOUR TRAVEL - % YES (CS3 SURVEY).....	10
TABLE 2-10 ARE YOU ABLE TO TRAVEL BY PUBLIC TRANSPORT? (CS3 SURVEY).....	10
TABLE 2-11 DO YOU HAVE A DRIVING LICENCE? (CS3 SURVEY).....	10
TABLE 2-12 DO YOU HAVE ACCESS TO A CAR? (CS3 SURVEY).....	10
TABLE 2-13 WHO USUALLY PROVIDES THE REQUIRED ASSISTANCE DURING A TRIP? (CS3 SURVEY).....	11
TABLE 2-14 AND HOW OFTEN DO YOU MAKE THIS TYPE OF TRIP? (CS3 SURVEY).....	11
TABLE 2-15 DO YOU MAKE USE OF THE INTERNET IN CONNECTION WITH YOUR TRAVEL? (CS3 SURVEY).....	11
TABLE 2-16 DO YOU HAVE A MOBILE PHONE? (CS3 SURVEY).....	12
TABLE 2-17 DO YOU USE YOUR MOBILE PHONE TO ASSIST WITH YOUR TRAVEL? (CS3 SURVEY).....	12
TABLE 2-18 JOURNEY PURPOSE OF MEDIUM/LONG DISTANCE TRIPS OCCASIONALLY OR RARELY MADE (CS3 SURVEY).....	12
TABLE 2-19 JOURNEY DISTANCE (CS3 SURVEY).....	12
TABLE 2-20 JOURNEY TIME (CS3 SURVEY).....	13
TABLE 2-21 MODE (CS3 SURVEY).....	13
TABLE 2-22 WHAT WAS THE ASSISTANCE USED? (CS3 SURVEY).....	13
TABLE 2-23 HOW EASY WOULD YOU FIND IT TO MAKE THIS JOURNEY WITHOUT THE USE OF ANY APPS? (CS3 SURVEY).....	13
TABLE 2-24 OVERALL SP MODELS FOR CAR USERS (CS3 SURVEY).....	16
TABLE 2-25 OVERALL SP MODELS FOR PUBLIC TRANSPORT USERS (CS3 SURVEY).....	18
TABLE 4-1 SURVEY SAMPLE DIFFERENTIATION IN REGARD TO GENDER (CS5 SURVEY).....	40
TABLE 4-2 SURVEY SAMPLE DIFFERENTIATION IN REGARD TO AGE (CS5 SURVEY).....	40
TABLE 4-3 SURVEY SAMPLE DIFFERENTIATION IN REGARD TO EDUCATION (CS5 SURVEY).....	40
TABLE 4-4 ACCEPTANCE OF INTERNET OR MOBILE PHONE BASED TRAVEL PLANNERS BY DIFFERENT DISTANCE TRAVELLERS (CS5 SURVEY).....	41
TABLE 4-5 ACCEPTANCE OF INTERNET OR MOBILE PHONE BASED TRAVEL PLANNERS BY DIFFERENT AGE GROUPS (CS5 SURVEY).....	41
TABLE 4-6 WILLINGNESS TO PAY FOR INTERNET OR MOBILE PHONE BASED TRAVEL PLANNERS (CS5 SURVEY).....	41
TABLE 4-7 PRICE ELASTICITY - INTERNET OR MOBILE PHONE BASED TRAVEL PLANNERS (CS5 SURVEY).....	41
TABLE 4-8 EXPECTED MODAL SHIFT AFTER INTRODUCTION OF INTERNET OR MOBILE PHONE BASED TRAVEL PLANNERS (CS5 SURVEY).....	42
TABLE 4-9 ACCEPTANCE OF ELECTRONIC REAL-TIME INFORMATION AT BUS STOPS BY DIFFERENT DISTANCE PASSENGERS (CS5 SURVEY).....	42
TABLE 4-10 ACCEPTANCE OF ELECTRONIC REAL-TIME INFORMATION AT BUS STOPS BY DIFFERENT AGE GROUPS (CS5 SURVEY).....	43
TABLE 4-11 WILLINGNESS TO PAY FOR ELECTRONIC REAL-TIME INFORMATION AT BUS STOPS (CS5 SURVEY).....	43
TABLE 4-12 PRICE ELASTICITY - ELECTRONIC REAL-TIME INFORMATION AT BUS STOPS (CS5 SURVEY).....	43

TABLE OF CONTENTS (Continued)

TABLE 4-13 EXPECTED MODAL SHIFT AFTER INTRODUCTION OF ELECTRONIC REAL-TIME INFORMATION AT BUS STOPS (CS5 SURVEY).....	43
TABLE 4-14 ACCEPTANCE OF TICKET PURCHASING VIA MOBILE PHONE/INTERNET AMONG DIFFERENT DISTANCE PASSENGERS (CS5 SURVEY).....	44
TABLE 4-15 ACCEPTANCE OF TICKET PURCHASING VIA MOBILE PHONE/INTERNET BY DIFFERENT AGE GROUPS (CS5 SURVEY).....	44
TABLE 4-16 WILLINGNESS TO PAY FOR TICKET PURCHASING VIA MOBILE PHONE/INTERNET (CS5 SURVEY) ...	45
TABLE 4-17 PRICE ELASTICITY - TICKET PURCHASING VIA MOBILE PHONE/INTERNET (CS5 SURVEY).....	45
TABLE 4-18 EXPECTED MODAL SHIFT AFTER INTRODUCTION OF TICKET PURCHASING VIA MOBILE PHONE/INTERNET (CS5 SURVEY)	45
TABLE 4-19 ACCEPTANCE OF REAL-TIME INFORMATION ON SERVICES VIA MOBILE PHONE/INTERNET AMONG DIFFERENT DISTANCE PASSENGERS (CS5 SURVEY).....	46
TABLE 4-20 ACCEPTANCE OF REAL-TIME INFORMATION ON SERVICES VIA MOBILE PHONE/INTERNET BY DIFFERENT AGE GROUPS (CS5 SURVEY)	46
TABLE 4-21 WILLINGNESS TO PAY FOR REAL-TIME INFORMATION ON SERVICES VIA MOBILE PHONE/INTERNET (CS5 SURVEY).....	46
TABLE 4-22 PRICE ELASTICITY - REAL-TIME INFORMATION ON SERVICES VIA MOBILE PHONE/INTERNET (CS5 SURVEY)	47
TABLE 4-23 EXPECTED MODAL SHIFT AFTER INTRODUCTION OF REAL-TIME INFORMATION ON SERVICES VIA MOBILE PHONE/INTERNET (CS5 SURVEY)	47
TABLE 4-24 ACCEPTANCE OF REAL-TIME INFORMATION ON SERVICES ON-BOARD OF VEHICLES AMONG DIFFERENT DISTANCE PASSENGERS (CS5 SURVEY).....	48
TABLE 4-25 ACCEPTANCE OF REAL-TIME INFORMATION ON SERVICES ON-BOARD OF VEHICLES BY DIFFERENT AGE GROUPS (CS5 SURVEY)	48
TABLE 4-26 WILLINGNESS TO PAY FOR REAL-TIME INFORMATION ON SERVICES ON BOARD OF VEHICLES (CS5 SURVEY)	48
TABLE 4-27 PRICE ELASTICITY - REAL-TIME INFORMATION ON SERVICES ON BOARD OF VEHICLES (CS5 SURVEY)	48
TABLE 4-28 EXPECTED MODAL SHIFT AFTER INTRODUCTION OF REAL-TIME INFORMATION ON SERVICES ON BOARD OF VEHICLES (CS5 SURVEY)	49
TABLE 4-29 ACCEPTANCE OF POSSIBILITY FOR DIRECT PICK-UP/DELIVERY OF PASSENGERS IN RESPONSE TO PRIOR DEMAND AMONG DIFFERENT DISTANCE PASSENGERS (CS5 SURVEY)	50
TABLE 4-30 ACCEPTANCE OF POSSIBILITY FOR DIRECT PICK-UP/DELIVERY OF PASSENGERS IN RESPONSE TO PRIOR DEMAND BY DIFFERENT AGE GROUPS (CS5 SURVEY)	50
TABLE 4-31 WILLINGNESS TO PAY FOR POSSIBILITY FOR DIRECT PICK-UP/DELIVERY OF PASSENGERS IN RESPONSE TO PRIOR DEMAND (CS5 SURVEY).....	50
TABLE 4-32 PRICE ELASTICITY - POSSIBILITY FOR DIRECT PICK-UP/DELIVERY OF PASSENGERS IN RESPONSE TO PRIOR DEMAND (CS5 SURVEY)	50
TABLE 4-33 EXPECTED MODAL SHIFT AFTER INTRODUCTION OF POSSIBILITY FOR DIRECT PICK-UP/DELIVERY OF PASSENGERS IN RESPONSE TO PRIOR DEMAND (CS5 SURVEY)	51
TABLE 5-1 SUMMARY OF MAIN EFFECTS OF PROPOSED ICT SOLUTIONS.....	52
TABLE 6-1 LIST OF THE MUNICIPALITIES SURVEYED AND THEIR POPULATION.....	59
TABLE 6-2 NUMBER OF RESPONDENTS IN EACH MUNICIPALITY	60
TABLE 6-3 TARIFF OF CITYBIKE VIENNA	72
TABLE 6-4 TARIFF OF LEIHRADL-NEXTBIKE IN LOWER AUSTRIA.....	72
TABLE 7-1 GEOGRAPHIC COVERAGE OF THE CS9 SURVEY.....	77
TABLE 7-2 RESPONDENTS OF THE CS9 SURVEY	78
TABLE 7-3 FOCUS GROUP CHARACTERISTICS AND RESULTS IN CS9 SURVEY.....	82
TABLE 8-1 ANSWER RATES FOR WEB-BASED (CS9 SURVEY)	94
TABLE 8-2 EDUCATION FACTOR IN WEB-BASED (CS9 SURVEY)	97
TABLE 8-3 LIST OF MAJOR TRAVEL PLANNERS COVERING THE SURVEY REGION (CS9 SURVEY).....	102
TABLE 9-1 CHARACTERISTICS OF TELEPHONE BASED CS9 SURVEY.....	117

EXECUTIVE SUMMARY

This deliverable reports on the results of surveys accompanying COMPASS case studies.

The analysis of a balanced set of cases in terms of topics and geographical coverage allows the discussion of the effects of different conditions existing at different urbanisation levels on proposed ICT solutions. Case studies have to build upon well researched data about user responses to proposed ICT solutions. To this effect several in-depth surveys were conducted in different setups across Europe. The following case studies have been based on surveys:

- Case study 3 - Accessibility applications for disabled people.
- Case study 4 - ITS solutions for Barcelona's local bus network.
- Case study 5 - Future interurban public transport in warminsko-mazurskie voivodship.
- Case study 7 - Bike-sharing in Vienna and the surrounding region.
- Case study 9 - Grass-root cooperative smart phone-based car-sharing.

The survey methodologies depended on the needs of a particular case study. Instead of developing a one fits-all survey a tailored approach has been adopted. This was necessary due to the large difference in both the considered ICT solutions and the characteristics of the survey areas. The surveys were based on various tools: questionnaires (field work, internet based, telephone based) as well as interviews (focus groups, telephone interviews). Both qualitative and quantitative approaches were utilised.

The surveys were designed to provide a maximum of information needed for each of the case studies. Hence unequal number of surveys per case study. Some of the case studies are set in well-researched areas where much basic information was already known (e.g. London, Barcelona), while others are in peripheral and rural areas (e.g. warminsko-mazurskie, rural Austria). In the former usually only one survey was necessary in order to gather data on the specifics of considered ICTs. In the latter more data gaps had to be filled, hence more than one survey was needed.

The most important information collected through surveys for each case study could be summarised as follows:

- For CS 3 the user acceptance, usage and problems which can be solved with the use of specific ICT solutions directed at disabled people have been researched.
- For CS 4 the user opinions on positive and negative aspects of the TMB (Barcelona's bus operator) solutions and the willingness to pay for additional services provided through ICT have been researched.
- For CS 5 the user acceptance of proposed ICT solutions for public transport, barriers to their introduction, possibilities for modal shift due to the introduction of ICTs, user willingness to pay for ICT applications, transferability potential of ICTs to rural areas have been researched.
- For CS 7 user acceptance of different ICTs used for bicycle traffic and especially for bike-sharing schemes, conditions for development of bike related ICTs and features of ICTs which might attract more users to bike-sharing have been researched.
- For CS 9 advantages and disadvantages of solutions used alongside car sharing schemes, user acceptance, interest to participate, impacts of employed solutions on user behaviours have been researched.

All data gathered through the surveys has been used for the development of case studies and provides one basis for D6.2 *An Assessment of the Potential Impact of ICT Solutions on a Co-Modal Transport System*.

1 INTRODUCTION

1.1 A SURVEY APPROACH TO CASE STUDIES

The surveys are a tool for data collection for those case studies where sufficient data is not available from general statistic information or from existing reports. Moreover surveys are designed so as to gather maximum useful information for particular case studies. Each survey is location specific and tailored to the needs of a case study. The need for surveys is also a derivative of the case study approach. It was an ambition of the project to cover most of the varied regions in the EU. As a result, regions characterised by low and high economic development, different population densities, various special features (geographic, societal etc.) have been selected. Obviously this selection means that some of the case studies were not primary places of interest for most of the researchers (e.g. low GDP peripheral regions). For other case studies although located in high intensity transport regions, the subject of the research has not yet been extensively researched (for instance use of ITC for special interest groups of users . like people with disabilities). For those cases little or no data exists in regard to the application of modern, technology intensive transport solutions. To breach this information gap surveys were designed.

The surveys were designed to gather information regarding:

- User transport behaviour.
- User reaction to different ITC solutions introduced into the transport system or user reaction to the proposed ICT solutions to be adapted in given transport system.
- Acceptability of the ICTs both from user and operator perspective.
- Consequences (social, financial, organisational, environmental) of introduction of ICTs to the general public, users, operators and regulators sides.
- Possible barriers preventing efficient use of ICTs of organisational, financial, administrative or legal type.
- Possible solutions removing identified barriers.

For some case studies it was necessary to add to the quantitative results qualitative data to better understand mechanisms for ITC acceptance and efficient use. In those cases more than one survey was conducted. Surveys were conducted on representative groups of users and non-users and in those cases where quantitative research has been augmented by qualitative . in depth analysis based on work with focus groups has been conducted.

The surveys have been concluded for the following case studies:

- Case study 3 . Accessibility applications for disabled people (1 survey).
- Case study 4 - ITS solutions for Barcelona's local bus network (1 survey).
- Case study 5 - Future interurban public transport in warminsko-mazurskie voivodship (2 surveys).
- Case study 7 . Bike-sharing in Vienna and the surrounding region (1 survey).
- Case study 9 - Grass-root cooperative smartphone-based car-sharing (3 surveys).

1.2 SURVEY METHODOLOGIES

There were two approaches to surveys adopted: quantitative analysis through questionnaires, on-line surveys and telephone interviews, and qualitative analysis based on focus groups interviews.

For CS 3 the survey was divided into parts inquiring about respondents mobility impairments and how they affect individual travel behaviour. The latter part was designed to examine the extent to which smartphone applications could enable the group of respondents to start travelling. The core element was a choice experiment focusing on willingness to pay for the provision of different types of information by the smartphone app. By selecting a mode choice experiment, the sample was split into three groups. A particular mode was assigned to the respondent based on a recent trip. Each smartphone app in the survey had the basic feature of providing information on optimal route and the

expected travel time to get from A to B. The additional information provided is split up into a planning phase and an interactive phase during the trip. For the planning phase two attributes were researched: accessibility info and pre-booking options. For the interactive phase it was decided not to include this option in every app offered in the experiment, so there was a ~~Yes~~ or ~~No~~ option in the design. All the following attribute levels were set to 0 or ~~No~~ if the app did not provide real-time information: route info, time efficiency gain, assist me request, cost for the use of the app.

For CS 4 a survey was conducted in the Passeig de les Aigües, in the Barcelona Tibidabo hills on February 2013 (sunny day) between 8 am and 5 pm at 10 points along Passeig de les Aigües and carried out in person by 10 interviewers. There were 533 respondents, of which 204 were bikers and 329 were pedestrians. The survey had 26 questions. 14 questions were common for bikers and pedestrians. 12 questions were specially adjusted depending whether the respondent was a biker or a pedestrian (only minor changes). The questions covered gender, age and neighbourhood where the respondent lives (3 questions), characteristics of the respondent's trip required to access the area of Passeig de les Aigües (11 questions), level of awareness of existing initiatives and services by TMB for a more efficient and user friendly bus transport in Barcelona (7 questions), potential acceptance of new applications for smart phones (5 questions).

For CS 5 the survey was based on the PAPI (interviewing with printed questionnaire) method. Sample size was 300 of which majority (266) represented travellers whose primary residence is in Szczecino region while the remaining 34 respondents were from outside of the region. The choice of respondents was random but representativeness in regard to gender, age, trip purpose was maintained. The survey took place between 27.11.2012 - 30.11.2012, in part at bus stops but mostly during the travel by bus. There was an agreement with transport service provider (bus company), which allowed to conduct this work on-board, therefore responses are well thorough as respondents were not in particular hurry. Second survey for CS 5 has been conducted based on the focus group interview method. Three groups of respondents were selected, two composed of users and potential users and third of the transport company employees - mainly bus drivers. Discussion within groups allowed for in-depth opinions as to the usefulness, evaluation and factors determining possible introduction of proposed ICT solutions into the public bus transport in the area. Groups were moderated by professional moderator while questions and topics were provided by UG. The method allows for in-depth analysis of user / provider reactions their motives, hidden objections, factors supporting and preventing easy introduction of ICTs into the transport system. The interviews took place on 14th and 15th of December 2012 in Szczecino.

For CS 7 the survey was carried out as a CATI (computer-aided telephone interview) by a professional telephone survey institution headquartered in Vienna. The survey timing was April and May 2013. The questionnaire was prepared by TUW in line with the previous similar survey of 2009 so additional material for comparability and trend analysis was available.

For CS9 four focus group interviews were conducted. As focus group interviews can provide information about a range of ideas and feelings that individuals have about certain issues, in this case this approach was used to gather information about grass-root car-sharing. The aim of these focus group interviews was to detect the motivation, the use in daily life and the advantages and disadvantages of private car-sharing from the users' point of view. Through the interaction with other users during the interview, multifaceted examples of usages, motivations, examples etc. were captured. In the four focus group interviews, the smallest group (in Thüringerberg) consisted of three persons while the largest group (in Gaubitsch) consisted of eight persons. The remaining two focus groups comprised of six persons. In every focus group interview three employees from TU Vienna were present to moderate and monitor the discussions. The focus group interviews took 100 to 150 minutes. The discussions were recorded and transcribed. The interviews took place between the end of January 2013 and the middle of February 2013 in the respective municipalities. The focus groups method was further augmented by the results of a web-based survey with a number of questions targeting the users of two grass-root cooperative car-sharing systems in Austria, namely CARUSO and Carsharing 24/7. The same questionnaire was used for the both systems' users. The CARUSO users were asked via each group leaders to participate in the questionnaire. 6 group leaders were contacted, who in turn passed questionnaires to the CARUSO members. 17 valid responses have been registered. The distribution of the survey questionnaire to the Carsharing 24/7 users was made via its regular user newsletter. There were 95 valid responses from this channel. The on-line survey was available from mid-February to 09 March 2013. Finally there was a third survey conducted a telephone survey conducted from the middle of February until the middle of April 2013 among users

from small cities and rural areas. The purpose of this survey was to determine what differences exist between large cities based users and rural user in the use of the system. The number to be called was chosen randomly from a phone directory that is available on-line. To increase the response rate, the survey was mostly carried out on weekdays approximately between 17:30 and 20:00, when people in such rural areas or in small cities in Austria tend to be at home.

2 SURVEY FOR CASE STUDY 3 – ACCESSIBILITY APPLICATIONS FOR DISABLED PEOPLE

2.1 EXECUTIVE SUMMARY OF THE SURVEY

A key component of the case study on accessibility apps for disabled people comprised the conduct of a targeted survey to gauge user reactions to the usefulness and value of these apps, and their constituent attributes. We designed a survey, including a stated choice experiment, for administration by a market research company to their on-line panel. The survey was open during May 2013 and yielded 259 respondents from throughout the UK.

A reasonably representative sample of people with a physical mobility impairment was achieved, with a reasonably representative mix of those who could be described as car-users, as compared with those who could be described as public transport users. Insights are provided into their travel behaviour and the extent to which they use ICTs to plan and prepare for that travel, set out in more detail below.

The stated choice experiment demonstrates that some smartphone app attributes are indeed valued, whilst others are not, and the detail of this is again set out below. Interestingly, the values of the features of an APP and the propensity to buy one are somewhat larger for public transport than car users which, given that the consequences of poor accessibility information and support are likely to be more problematic when travelling via public transport, seems quite plausible.

2.2 SURVEY CHARACTERISTICS

2.2.1 Survey Methodology

In order to test the usefulness of and the user reaction to smartphone apps for disabled people, it was decided to conduct a survey, including a stated choice experiment. Stated choice, or stated preference, is acknowledged to be a sound means of eliciting data reflecting how people would choose between different alternatives, given a described set of attributes of those alternatives. By asking respondents to choose, in a series of repeated scenarios (or choice tasks) in which the levels of the attributes are systematically varied, it is possible to uncover what the choices imply about how respondents value the different attributes.

Following an initial review of the available apps and the information requirements of different groups of disabled people, it was decided to focus on disabled people experiencing physical mobility impairments. Acknowledging the considerable diversity across the population of disabled people as a whole, the decision was taken to focus on this subgroup of disabled people because desk research had shown there to be some common features of the information needs and general travel patterns for this subgroup and, in part because it represents quite a significant proportion of disabled people. An alternative would have been to focus on sensory impaired people (vision and hearing impairments), but this subgroup is known to have very different information needs to otherwise disabled people and to rely on public transport to a much greater extent.

ITS designed the survey and sought quotes for its conduct. The available resources meant that we were in a position to commission 250 responses from an on-line research panel. In the event, The Compass survey was completed by 259 respondents.

The survey itself was divided into various parts inquiring about respondents' mobility impairments and how they affect individual travel behaviour. For example, the amount and type of assistance needed during a trip was sought, as well as details of more and less-frequently made journey-types. The goal of the survey was then to examine the extent to which smartphone applications could enable the group of respondents to start travelling, i.e. make journeys more accessible. The core element was a choice experiment focusing on willingness to pay for the provision of different types of information by the smartphone app.

The choice experiment itself was a decision between two mobility apps providing different levels of information services, and an opt out option in case a respondent wished to select not to use the app. Thus, there were three alternatives to choose from . to buy one or other of the apps, or neither.

The apps were focused to provide information for a specific mode of transport (Bus, Car or Train) and each respondent was presented with 10 choice tasks each. Accordingly, the experiment can best be described as a within mode choice experiment. By selecting a within mode choice experiment, the sample was split into three groups. We could have decided to assign respondents to these 3 groups randomly, resulting in approximately 80 respondents in each group. However, we determined that it would be preferable to include a section in the survey that inquires about available travel modes and recent trips and assign a particular mode based on a recent trip. In doing so, we were aware that this might have resulted in an unbalanced division across the modes, likely to over represent car, the dominant mode. Since the design for each mode is generated independently, this was felt not to be too much of an issue (likely to be capable of being resolved by the joint analysis of the PT modes). A copy of the full survey is provided as an appendix.

2.2.2 Geographical Area Covered by the Survey Research

The case study, and hence the survey, was not geographically specific . rather, its focus was determined by the group of travellers being studied . I.E. disabled travellers. For ease, we and pragmatism, we chose to conduct the survey in the UK, and respondents were drawn from the UK panel of the selected market research provider.

2.2.3 Respondents

As mentioned above, our dataset included 259 responses, but the total sample of those who completed the SP exercise is 207. A key feature of the SP exercise is whether the respondent's recent occasional or rare medium or long distance trip related to car (driver, passenger and taxi) or public transport (rail and bus); we might expect the attitudes to different aspects of the apps to differ between the two. Hence we have distinguished between the two in the tables below, as well as providing figures for the sample as a whole. In total we have 159 car users and 48 public transport users.

Table 2-1 reports the types of physical impairment in our sample. Walking difficulties are the largest form of impairment, with sizeable proportions for both those who require the use of a walking aid and those who do not. The other category is also significant. Those who need to use a wheelchair or with some kind of respiratory disease form low proportions of the total.

Table 2-1 Types of Impairment (CS3 survey)

	All	Car	PT
Walking difficulties which require the use of a stick or some other walking aid (e.g. as a result of arthritis)	68 (33%)	58 (37%)	10 (21%)
Walking difficulties, though not to the extent of needing to use a walking aid	60 (29%)	42 (26%)	18 (38%)
Wheelchair user	14 (7%)	11 (7%)	3 (6%)
Chronic (heart or) respiratory disease	17 (8%)	15 (9%)	2 (4%)
Other	48 (23%)	33 (21%)	15 (31%)
Total	207 (100%)	159 (100%)	48 (100%)

Table 2-2 indicates that the sample contains slightly more females than would be expected in the population at large.

Table 2-2 Gender (CS3 survey)

	All	Car	PT
Male	85 (41%)	70 (44%)	15 (31%)
Female	122 (59%)	89 (56%)	33 (69%)

As for age group, Table 2-3 indicates that most of the population is in the older categories. This is hardly surprising. The distribution across age groups is fairly similar for car and PT.

Table 2-3 Age Group (CS3 survey)

	All	Car	PT
18-25	6 (3%)	4 (3%)	2 (4%)
26-34	5 (2%)	2 (1%)	3 (6%)
35-44	17 (8%)	12 (8%)	5 (10%)
45-54	43 (21%)	34 (21%)	9 (19%)
55-59	54 (26%)	38 (24%)	16 (33%)
60-64	44 (21%)	36 (23%)	8 (17%)
65-69	24 (12%)	21 (13%)	3 (6%)
70+	14 (7%)	12 (8%)	2 (4%)

The employment status of the sample is reported in Table 2-4. It is not surprising that a large proportion are in the unemployed and retired categories.

Table 2-4 Employment Status (CS3 survey)

	All	Car	PT
Full time employee	33 (16%)	22 (14%)	11 (23%)
Part time employee	14 (7%)	9 (6%)	5 (10%)
Self-employed	12 (6%)	11 (7%)	1 (2%)
Student	3 (1%)	2 (1%)	1 (2%)
Retired	77 (37%)	67 (42%)	10 (21%)
Full time home maker	20 (10%)	15 (9%)	5 (10%)
Unemployed	48 (23%)	33 (21%)	15 (31%)

The income categories are reported in Table 2-5. It is not surprising that the PT users have larger proportions in the low income categories. Indeed, in general the sample has relatively low incomes which is to be expected.

Table 2-5 Income Categories (CS3 survey)

		All	Car	PT
1	Less than £10,000	32 (16%)	20 (13%)	12 (25%)
2	£10,000 - £19,999	64 (31%)	45 (28%)	19 (40%)
3	£20,000 - £29,999	37 (18%)	30 (19%)	7 (15%)
4	£30,000 - £39,999	18 (9%)	17 (11%)	1 (2%)
5	£40,000 - £49,999	19 (9%)	16 (10%)	3 (6%)
6	£50,000 - £59,999	7 (3%)	6 (4%)	1 (2%)
7	£60,000 - £69,999	5 (2%)	3 (2%)	2 (4%)
8	Over £70,000	3 (1%)	2 (1%)	1 (2%)
	Prefer Not to Say	22 (11%)	20 (13%)	2 (4%)

Table 2-6 indicates that there is a reasonable spread across the different categories of mobility fluctuation. Most regard their mobility situation to be fairly constant but there are significant numbers in other categories.

Table 2-6 Does your physical mobility fluctuate significantly from one day to the next? (CS3 survey)

	All	Car	PT
No, it is fairly constant	72 (35%)	53 (33%)	19 (40%)
Yes, there are good and bad days, in roughly equal proportion	63 (30%)	50 (31%)	13 (27%)
Yes, there are good and bad days but more bad than good	50 (24%)	40 (25%)	10 (21%)

Yes, there are good and bad days but more good than bad	22 (11%)	16 (10%)	6 (13%)
---	----------	----------	---------

When it comes to being able to comfortably walk, Table 2-7 provides a distribution across different distance bands. Many cannot walk very far without a rest, but similarly for many there is no problem with 150 metres or more. It is to be expected that PT users have less of a problem here.

Table 2-7 On a good day, approximately how far can you comfortably walk without needing to take a rest? (CS3 survey)

		All	Car	PT
1	Less than 50 metres	58 (30%)	47 (32%)	11 (24%)
2	50 metres	38 (20%)	32 (22%)	6 (13%)
3	100 metres	20 (10%)	15 (10%)	5 (11%)
4	150 metres	15 (8%)	13 (9%)	2 (4%)
5	More than 150 metres	62 (32%)	41 (28%)	21 (47%)

2.2.4 Solutions Considered

Each smartphone app in the survey had the basic feature of providing information on optimal route and the expected travel time to get from A to B. The additional information provided is split up into a planning phase and an interactive phase during the trip.

Planning phase: This stage mainly refers to static info provided by the app.

Attribute 1: Accessibility info - This offered options to provide information such as maps and directions regarding the accessibility of important places along the route, for example train stations, petrol stations, but also the availability of staff assistance or disabled parking spaces at those facilities.

Attribute 2: Pre-booking options - The app allowed travellers to pre-book a disabled parking space, accessible taxis or assistance at stations before starting the trip.

Attribute 3: Interactive phase - It was decided not to include this option in every app offered in the experiment, so there was a Yes or No option in the design. All the following attribute levels were set to 0 or No if the app did not provide real-time information

Attribute 4: Route info - For cars, this attribute operated like a satnav system with updated route and disruption info, including rerouting. For trains and buses this mainly focused on up-to-date arrival and departure times for connecting services, information on the next stop and ETA and accessibility of the approaching vehicle.

Attribute 5: Time efficiency gain - The real-time option of the app will optimise the route for cars, but may also improve the efficiency for public transport users by sending them to the right platform and making sure station staff are notified in time for the arrival of the disabled person. This may result in decreases in travel time.

Attribute 6: Assist me request - The app proposed to include an attribute which makes sure that the traveller is tapped into the system such that assistance can be provided and will be warned in time. For cars, this relates to assistance at service stations and connection to break down services. In the latter case, leaving the car is sometimes not an option where the driver is experiencing physical mobility impairments. For public transport, the app enabled assistance personnel to be alerted that a traveller with specific needs is approaching the station and bus drivers to be alerted when these passengers need to access or leave the vehicle.

Attribute 7: Cost - Cost for the use of the app.

The attributes used and the levels they took for each mode are set out in Table 2-8.

Table 2-8 Attributes and Levels in the SP Exercise (CS3 survey)

Attribute	Mode	Level 1	Level 2	Level 3	Level 4
Accessibility information	Car	Map of arrival area	Location and number of disabled parking spots	Distance from (disabled) parking to destination	Assistance availability at service stations along the route and point of arrival
	Train	Station Map	Distance between and accessibility of platforms	Distance between and accessibility of connecting services	Staff availability on station and in train
	Bus	Localised maps	Accessible walking route to bus stop and destination	Distance between and accessibility of connecting services	Staff availability on main bus station
Pre-booking options	Car	No options	Pre-book disabled parking spot	Pre-book assistance at car park	
	Train	No options	Pre-book staff assistance at station	Pre-book accessible taxi	
	Bus	No options	Pre-book staff assistance at main bus station	Pre-book accessible taxi	
Real-time App	Car	No	Yes		
	Train	No	Yes		
	Bus	No	Yes		
Route information	Car	No	Directions during trip	Disruption info and rerouting	Both
	Train	No	Info on next station and estimated arrival time	Up to date connection info at interchange	Accessibility info of arriving train
	Bus	No	Info on next stop and estimated arrival time	Up to date connection info at interchange	Accessibility info and seat availability of arriving bus
Efficiency Gain in Time	Car	0.00%	5.00%	10.00%	15.00%
	Train	0.00%	5.00%	10.00%	15.00%
	Bus	0.00%	5.00%	10.00%	15.00%
Assist me request	Car	No	At service station	Road break down services	At car park
	Train	No	On-board assistance	Platform assistance	
	Bus	No	Assistance at main bus station	Warn bus driver on access and egress stops	
Purchase model	Car	Permanent license	Annual subscription	Pay as you go (per trip payment)	
	Train	Permanent license	Annual subscription	Pay as you go (per trip payment)	
	Bus	Permanent license	Annual subscription	Pay as you go (per trip payment)	
Cost (£)	Permanent license	50	75	100	
	Annual subscription	15	25	35	
	Pay as you go (per trip payment)	1	2	3	

2.3 RESULTS

We start by presenting results relating to the ways in which physical mobility impairments impact on travel and on the ways people plan and prepare for travel, before then turning to present the initial analysis of the stated preference results.

Table 2-9 indicates how physical mobility impairment affects travel. The numbers are generally similar for car and PT, although surprisingly the proportion stating that they do not go out as much as they would like to is less for PT!

Table 2-9 How does your physical mobility impairment affect your travel - % Yes (CS3 survey)

	All	Car	PT
I am only able to go travelling on good days	42 (31%)	35 (33%)	7 (24%)
I can do local trips by myself, but need assistance during longer trips	48 (23%)	39 (25%)	9 (19%)
I always need assistance when going outside, irrespective of the trip	31 (15%)	26 (16%)	5 (10%)
I always have to plan my journeys really carefully	84 (41%)	67 (42%)	17 (35%)
Not specifically, but walking takes more time	85 (41%)	59 (37%)	26 (54%)
I don't go out as much as I'd like to	91 (44%)	77 (48%)	14 (29%)

Note: The first question was not relevant for 72 of the total, made up of 53 car users and 19 PT users.

Table 2-10 indicates that the majority are able to travel by public transport without assistance. As might be expected, this figure is somewhat larger for PT users. And as might be expected, the proportion of PT users stating that they could not travel by PT is very low! The proportions needing assistance is fairly similar for car and PT.

Table 2-10 Are you able to travel by public transport? (CS3 survey)

	All	Car	PT
Yes, without any assistance	117 (56%)	82 (52%)	35 (73%)
Yes, but I need assistance in getting on and off the vehicle	34 (16%)	27 (17%)	7 (15%)
Yes, but I need assistance (other than with getting on and off the vehicle)	17 (8%)	11 (7%)	6 (13%)
No	43 (21%)	41 (26%)	2 (4%)

The proportion with access to a driving licence is given in Table 2-11. Most have a driving licence and as would be expected the proportion is lower for PT users.

Table 2-11 Do you have a driving licence? (CS3 survey)

	All	Car	PT
Yes	159 (77%)	134 (84%)	25 (52%)
No	48 (23%)	25 (16%)	23 (48%)

Table 2-12 reports the numbers having access to a car, although not specifically for the journey covered in the SP exercises. As expected, a large proportion of car users have access to a car whenever they want but with much lower figures for PT users. Indeed, almost half of PT users had no access to a car.

Table 2-12 Do you have access to a car? (CS3 survey)

	All	Car	PT
Yes, whenever I want	119 (58%)	106 (67%)	13 (27%)

Yes, but shared with other drivers	19 (9%)	17 (11%)	2 (4%)
Yes, but someone else needs to drive	38 (18%)	29 (18%)	9 (19%)
No	31 (15%)	7 (4%)	24 (50%)

As for providing assistance during a trip, friends and family are, as expected, by far the largest proportion. The proportions for the other providers are also quite large.

Table 2-13 Who usually provides the required assistance during a trip? (CS3 survey)

	All	Car	PT
Friends and family	146 (71%)	118 (74%)	28 (58%)
Neighbours	6 (3%)	5 (3%)	1 (2%)
Staff at shops, train and bus stations, etc	18 (9%)	10 (6%)	8 (17%)
My PA or carer	17 (8%)	10 (6%)	7 (15%)
Other (please specify)	39 (19%)	31 (20%)	8 (17%)

Turning to the frequency of making different types of trips, Table 2-14 reports the distribution of trips for different purposes across four broad categories of use. Trips for work, education and shopping are those made frequently, with visiting nearby friends and family also relatively frequent. Shopping out of town occurs occasionally as does visiting friends and family out of town but generally most types of trip are made very infrequently.

Table 2-14 And how often do you make this type of trip? (CS3 survey)

	1	2	3	4
To work/education/shopping/health	67 (32%)	61 (30%)	5 (2%)	74 (36%)
Visit nearby friends/family or other local trips	25 (12%)	122 (59%)	23 (11%)	37 (18%)
To work out of town	6 (3%)	6 (3%)	7 (3%)	188 (91%)
To shop out of town	2 (1%)	62 (30%)	26 (13%)	117 (57%)
To an out of town health appointment	3 (1%)	31 (15%)	57 (28%)	116 (56%)
To go on a short break or holiday	0 (0%)	7 (3%)	107 (52%)	93 (45%)
Visit friends/ family out of town or other non-local trips	0 (0%)	50 (24%)	81 (39%)	76 (37%)

Note: 1 = frequently (5 per week), 2 = occasionally (5 per month), 3 = rarely (5 per year), 4 = none made.

Table 2-15 indicates that most use the internet in connection with their travel, and not surprisingly the degree of use is greater for PT users.

Table 2-15 Do you make use of the internet in connection with your travel? (CS3 survey)

	All	Car	PT
Yes, sometimes	121 (59%)	86 (54%)	35 (73%)
Yes, always	28 (14%)	22 (14%)	6 (13%)
No	58 (28%)	51 (32%)	7 (15%)

The vast majority of respondents have a mobile phone, as might be expected and is apparent from Table 2-16. The sample is very evenly split between whether it is a smartphone or not.

Table 2-16 Do you have a mobile phone? (CS3 survey)

	All	Car	PT
Yes, but it is not a smartphone	100 (48%)	78 (49%)	22 (46%)
Yes, and it is a smartphone	102 (49%)	76 (48%)	26 (54%)
No	5 (2%)	5 (3%)	0 (0%)

Table 2-17 indicates the extent to which the mobile phone is used to assist with travel. Around a half of the sample, including both car and PT users, do not use their mobile phone to assist with travel. The proportions with specific apps for assistance is particularly low. Car users are more inclined to use the mobile phone to speak to people whereas PT users are equally likely to use it for speaking to people and accessing the internet.

Table 2-17 Do you use your mobile phone to assist with your travel? (CS3 survey)

	All	Car	PT
Yes, in order to speak to people	75 (37%)	61 (40%)	14 (29%)
Yes, in order to access the internet	47 (23%)	32 (21%)	15 (31%)
Yes, I have specific apps on my phone which assist me	15 (7%)	13 (8%)	2 (4%)
No	104 (52%)	81 (53%)	23 (48%)

As mentioned above, the SP exercise was based around people who occasionally or rarely made medium or long distance trips. Table 2-18 indicates that most trips were made to visit friends or relatives, followed by holiday and, perhaps surprisingly, health and medical purposes. Shopping forms a fairly small proportion whilst travelling to or in the course of work is trivial. Table 2.18 presents responses on journey distance, and shows that the largest proportions are below 30 miles although there are sufficient numbers in the other two categories.

Table 2-18 Journey Purpose of Medium/Long Distance Trips Occasionally or Rarely Made (CS3 survey)

	All	Car	PT
Travel to work	4 (2%)	2 (1%)	2 (4%)
Travel in the course of work	2 (1%)	2 (1%)	0 (0%)
Health/medical	50 (24%)	42 (26%)	8 (17%)
Shopping	20 (10%)	15 (9%)	5 (10%)
Visiting friends/relatives	69 (33%)	53 (33%)	16 (33%)
Holiday	48 (23%)	36 (23%)	12 (25%)
Other	14 (7%)	9 (6%)	5 (10%)

Table 2-19 Journey Distance (CS3 survey)

	All	Car	PT
10-30 miles	86 (42%)	67 (42%)	19 (40%)
31-100 miles	63 (30%)	51 (32%)	12 (25%)
Over 100 miles	58 (28%)	41 (26%)	17 (35%)

There is a good spread across different journey time bands, as Table 2-20 demonstrates. This provides a good basis for exploring whether the willingness to pay for apps depends upon the length of the journey.

Table 2-20 Journey Time (CS3 survey)

	All	Car	PT
Less than half an hour	24 (12%)	19 (12%)	5 (10%)
Half an Hour to One hour	59 (29%)	53 (33%)	6 (13%)
One to Two Hours	55 (27%)	38 (24%)	17 (35%)
Two to Four Hours	36 (17%)	25 (16%)	11 (23%)
Over Four Hours	33 (16%)	24 (15%)	9 (19%)

As far as mode is concerned, car users are almost equally split between drivers and passengers, with a few taxi users included. There are three times as many train as bus users in our sample.

Table 2-21 Mode (CS3 survey)

	All	Car	PT
Car Driver	74 (36%)	74 (47%)	0 (0%)
Car Passenger	76 (37%)	76 (48%)	0 (0%)
Train	36 (17%)	0 (0%)	36 (75%)
Bus	12 (6%)	0 (0%)	12 (25%)
Taxi	9 (4%)	9 (6%)	0 (0%)

Table 2-22 indicates the assistance used. In general, it seems around a third of people used assistance, with getting into and out of vehicles the most used. However, the use of information about the accessibility of facilities was also quite popular as was the use of satellite navigation amongst car users. Significant numbers specified other forms of assistance.

Table 2-22 What was the assistance used? (CS3 survey)

	All	Car	PT
Getting into/onto the vehicle	69 (33%)	50 (31%)	19 (40%)
Getting out of/off the vehicle	77 (37%)	59 (37%)	18 (38%)
Information about the accessibility of facilities (e.g. services stations, parking, railway stations etc.)	63 (30%)	44 (28%)	19 (40%)
Satellite navigation	47 (23%)	46 (29%)	1 (2%)
Other	57 (28%)	42 (26%)	15 (31%)

Finally, we examine how easy it would have been to make the journey without any apps. The vast majority felt it would be easy or neither easy nor difficult. This would seem to suggest that apps are not highly valued. Very small proportions would find the journey very difficult without the apps. This is perhaps a result of us having asked them to consider a trip that they had already made, and though we focused on a trip which they make either rarely or occasionally deliberately aiming to capture trips that were likely to be more difficult, the fact that they had made it before necessarily means that they had been able to do it

Table 2-23 How easy would you find it to make this journey without the use of any apps? (CS3 survey)

	All	Car	PT
Very Easy	46 (22%)	39 (25%)	7 (15%)
Easy	47 (23%)	37 (23%)	10 (21%)
Neither Easy nor Difficult	87 (42%)	66 (42%)	21 (44%)
Difficult	23 (11%)	14 (9%)	9 (19%)
Very Difficult	4 (2%)	3 (2%)	1 (2%)

We now turn to present the analysis of the SP exercise. The SP exercise was completed by 159 car users and 48 PT users, therefore yielding 1590 and 480 observations respectively (10 choice observations per respondent).

We discuss the car user models first. Option 1 is chosen 362 (23%) times, option 2 is chosen 303 (19%) times whilst the APP is not purchased on 925 (58%) occasions.

We have estimated logit models to the discrete choice SP responses. These models relate the probability of choosing an alternative to the utility of each alternative. In turn, the utility of each alternative is a function of the attributes used to characterise it in the SP exercise.

The models we have estimated specify dummy variables to represent the categorical variables relating to accessibility information, pre-booking options, real-time APP, route information, assist me request and subscription type. If there are n categories, then $n-1$ dummy variables are entered and their coefficients represent their effects on utility relative to the arbitrarily omitted category. Given that we have three alternatives, we can specify two alternative specific constants (ASCs). Continuous variables, such as cost and efficiency gain in time, are entered in linear-additive form. Thus monetary valuations are obtained as the ratio of the relevant coefficient and the time coefficient.

We have specified different cost terms for the permanent licence, the annual subscription and pay as you go, on the grounds that the behavioural response to each will vary, in part depending on frequency of trip making. We did estimate a model with dummy variables specifically for the purchase model but they were both far from significant. We therefore removed them on the grounds that attitudes towards the specific purchase model are being discerned by the separate cost terms specified for each.

The first model reported (NL) is a nested logit model, combining the two APP options in a single nest. It achieves, what is in our experience for SP choice models, a good fit to the data, although the t ratios associated with the coefficient estimates are generally disappointing. The scale parameter implies a logsum parameter of 0.25, which lies between 0 and 1 as required. This will have the effect of considerably reducing the cross elasticity between the purchase and not purchase options compared to the cross elasticity between the two APP options.

Nonetheless, the second model is a multinomial logit model (MNL) and despite the worse fit overall it does lead to some distinct improvements in t ratios. Given this, and that the t ratio of the scale in the NL model was only just significantly different from a value of one at which the NL model collapses to MNL, we have persisted with the MNL model.

The second MNL model removed the ASC relating to the not purchase option (ASC3) since not only was it not significant but it was highly correlated with other variables. We also removed ASC1 as insignificant and because there is no reason to expect a preference for APP option 1 over APP option 2 all else equal. This leads to some further increases in t ratios. However, MNL2 still contains some insignificant coefficients and indeed some wrong sign yet significant ones.

The three terms relating to accessibility information are all negative and indeed the coefficient for assistance availability at service stations along the route and point of arrival is significant. We would expect these coefficients to be positive, if anything, given that they can be expected to be preferred to the base category of just a map of the arrival area. MNL removes these three coefficients and also the others that were not significant at the 5% level of significance. The latter are a further seven terms. As for the assist me request terms, there was no preference for such a facility for car parks or at service stations. A contributory factor here could be that the respondent might not use service stations and might not park in a car park, or that there were insufficient numbers of respondents who required assistance with these stages of their trip. However, there was a positive value in the context of road break down services, and it seems plausible that this is the strongest effect.

There was a significant value associated with being able to pre-book a disabled parking spot but the ability to pre-book assistance at the car park was not significant. Perhaps the presence of other travellers reduces the need for the latter, or again there may have been insufficient numbers of respondents who specifically required this type of assistance. Nor was there a significant benefit from the presence of a real-time APP. As for route information, car users did place a significant value on

directions during the trip, and this is the largest effect in the model, but they did not value disruption information and rerouting, perhaps because they perceive this to be such a rare occurrence.

Surprisingly, the efficiency gain in time was not significant. It may be that respondents did not believe that the APP could credibly achieve such time efficiencies, or it may be related to the trip under consideration being viewed as non-time critical.

The three cost coefficients are all highly significant. Those for licence and subscription are so much smaller since the fees are much higher to cover the longer periods. The licence coefficient would be equivalent to the pay as you go coefficient for eight trips whilst the subscription coefficient would be equivalent to the pay as you go coefficient for just over four trips. These numbers seem sensible.

The easiest way to obtain willingness to pay values is to use the pay as you go coefficient since it will yield a value per trip. For the three significant coefficients we obtain the following values:

- £0.69 per trip for the road break down assistance
- £1.50 per trip for the pre-book disabled parking slot
- £1.60 per trip for directions during the trip.

These valuations seem plausible. To place them in context, the official value of travel time savings in the UK is around £0.08 per minute, so the largest value above is equivalent to 20 minutes on a round trip.

Table 2-24 Overall SP Models for Car Users (CS3 survey)

	NL	MNL1	MNL2	MNL3
Alternative Specific Constant (Option 1)	0.025 (0.7)	0.103 (1.0)	-	-
Alternative Specific Constant (Option 2)	-	-	-	-
Alternative Specific Constant (Option 3)	0.163 (0.7)	0.048 (0.1)	-	-
Map of arrival area (Base)	-	-	-	-
Location and number of disabled parking spots	-0.054 (0.5)	-0.185 (1.0)	-0.199 (1.2)	-
Distance from (disabled) parking to destination	-0.078 (0.7)	-0.241 (1.5)	-0.215 (1.7)	-
Assistance availability at service stations along the route and point of arrival	-0.232 (2.1)	-0.626 (3.0)	-0.624 (4.3)	-
No Assist Me Request (Base)	-	-	-	-
At Service Station	0.124 (1.5)	-0.010 (0.1)	-0.007 (0.0)	-
Road Break Down Services	0.237 (2.2)	0.274 (1.4)	0.289 (1.6)	0.168 (2.5)
At Car Park	0.088 (0.8)	0.054 (0.3)	0.060 (0.3)	-
No Pre-booking options	-	-	-	-
Pre-book disabled parking spot	0.242 (2.7)	0.484 (3.5)	0.515 (3.9)	0.365 (3.2)
Pre-book assistance at car park	0.033 (0.4)	0.113 (0.8)	0.160 (1.3)	-
No Real-time APP (Base)	-	-	-	-
Real-time APP	-0.059 (0.5)	-0.061 (0.2)	-0.107 (0.6)	-
No Route Information (Base)	-	-	-	-
Directions during trip	0.139 (1.6)	0.353 (1.9)	0.418 (2.5)	0.390 (3.5)
Disruption information and Rerouting	0.020 (0.3)	-0.051 (0.3)	-0.038 (0.2)	-
Both	0.125 (1.4)	-0.011 (0.1)	0.039 (0.2)	-
Efficiency Gain in Time (%)	-0.0001 (0.0)	0.006 (0.5)	0.0053 (0.6)	-
Cost Licence	-0.0091 (2.6)	-0.0298 (11.4)	-0.0298 (11.7)	-0.0318 (15.8)
Cost Pay as You Go	-0.0981 (1.4)	-0.2210 (2.2)	-0.2310 (4.1)	-0.2431 (6.5)
Cost Subscription	-0.0249 (3.0)	-0.0513 (7.2)	-0.0514 (9.6)	-0.0568 (14.8)
Scale	4.01 (2.1) ^a	-	-	-
Log-Likelihood	-1332.9	-1342.9	-1343.5	-1356.1
Adjusted ²	0.226	0.221	0.222	0.220

Note: ^a t ratio with respect to one.

Turning to the public transport users, option 1 is chosen 153 (32%) times, option 2 is chosen 130 (27%) times whilst the APP is not purchased on 197 (41%) occasions. Thus public transport users have a somewhat greater interest in purchasing the APP. The same set of models were estimated as for car users and these are reported in Table 2-25.

Although the levels can be different for train and bus users, such as the level 2 accessibilities of distance between platforms for train and accessible walking route to stop and destination for bus, we have so few observations for public transport that it would be futile to try and distinguish between them. This indeed turned out to be the case when we tried it!

The scale parameter in the NL model is not significantly different from one and hence the MNL is justified on empirical grounds. MNL1 contains the full set of attributes. It can be seen that a lot of the coefficients are not significant at the 5% level, although the limited sample size will not have helped here. Following the same procedure as for car users, we removed the ASCs, both of which were far from significant. This had little effect on the t ratios of the other coefficient estimates.

We then removed coefficients step by step, starting with those with the lowest t ratios until we arrived at MNL3. We have retained coefficients with t ratios greater than one, being more generous than we

might otherwise be given the relatively small data set, although only two coefficient estimates in MNL3 are not significant at the 95% level.

As with car users, none of the coefficients for the accessibility information are retained, although this is because they all had t ratios less than one. It may be that respondents have a reasonably good idea about the distances in the first two levels or and they might have presumed that there would be staff available on trains anyway.

Surprisingly, neither of the assist me request terms were significant, perhaps due to the concept of being able to request assistance on-route being unfamiliar to respondents.

The pre-booking options were both significant, with the taxi being more important than staff assistance at the station. As with car users, there was no value for a real-time APP and again the efficiency gain in time was far from significant.

The three information terms were all significant with fairly similar coefficients. We again find that cost coefficients for licence and subscription are somewhat smaller than for the pay as you go option.

Our preference is to use the pay as you go cost coefficient as the numeraire in calculating money values. A slight concern here is that the coefficient is not quite significant. In this case, the licence coefficient would be equivalent to the pay as you go coefficient for 4.7 trips (as opposed to 8 for car users) whilst the subscription coefficient would be equivalent to the pay as you go coefficient for 2.3 trips (as opposed to 4.3 for car users). Thus these ratios in the range of 50-60% of the previous ratios, and this might be due to the relatively low precision of the pay as you go cost coefficient. Given this, and the much greater precision with which the licence and subscription coefficients are estimated, there is a case for basing values on a corrected pay as you go coefficient which is 55% larger. We present values below for the original pay as you go cost coefficient and the revised one (in brackets based on a cost coefficient 80% larger). These are:

- Pre-booking staff assistance at station £1.81 (£1.01) per trip
- Pre-booking accessible taxi £2.92 (£1.62) per trip
- Information on next station/stop and arrival time £5.32 (£2.96) per trip
- Up to date connection information £4.60 (£2.56) per trip
- Accessibility information of arriving train or bus is £6.01 (£3.34) per trip

On balance we prefer the amended values as being more credible.

At the official value of time, the amended values range from 12.6 minutes per round trip for pre-booking staff assistance at stations to 41.8 minutes for accessibility information per round trip.

It seems that the values of the features of an APP and the propensity to buy one are somewhat larger for public transport than car users. This seems quite plausible, given that the consequences of poor accessibility information and support are likely to be more problematic when travelling via public transport than via car.

Table 2-25 Overall SP Models for Public Transport Users (CS3 survey)

	NL	MNL1	MNL2	MNL3
Alternative Specific Constant (Option 1)	-0.024 (0.1)	-0.062 (0.4)	-	-
Alternative Specific Constant (Option 2)	-	-	-	-
Alternative Specific Constant (Option 3)	-0.080 (0.2)	-0.018 (0.1)	-	-
Station/local map (Base)	-	-	-	-
Distance between/accessibility platforms Accessible walking route to stop and destination	0.198 (0.5)	0.223 (0.8)	0.214 (0.9)	-
Distance between and accessibility of connecting services	0.191 (0.3)	0.285 (1.0)	0.276 (1.2)	-
Staff availability on station and in train	0.052 (0.2)	0.056 (0.2)	0.040 (0.2)	-
No Assist Me Request (Base)	-	-	-	-
On board assistance Assistance at main bus station	-0.320 (0.4)	-0.428 (2.2)	-0.398 (1.5)	-
Platform assistance Warn bus driver on access and egress stops	0.123 (0.1)	0.273 (1.1)	0.256 (0.9)	-
No Pre-booking options	-	-	-	-
Pre-book staff assistance at station	0.212 (0.5)	0.252 (1.0)	0.252 (1.1)	0.236 (1.1)
Pre-book accessible taxi	0.237 (0.2)	0.415 (1.9)	0.393 (2.1)	0.380 (2.2)
No Real-time APP (Base)	-	-	-	-
Real-time APP	0.294 (0.9)	0.260 (0.8)	0.246 (0.8)	-
No Route Information (Base)	-	-	-	-
Info on next station/stop and estimated arrival time	0.387 (0.3)	0.548 (1.6)	0.552 (1.9)	0.692 (3.3)
Up to date connection info at interchange	0.307 (0.3)	0.443 (1.5)	0.434 (1.6)	0.598 (3.1)
Accessibility info of arriving train Accessibility info and seat availability of arriving bus	0.368 (0.4)	0.497 (1.6)	0.449 (1.7)	0.781 (3.7)
Efficiency Gain in Time (%)	-0.003 (0.1)	0.000 (0.0)	0.000 (0.0)	-
Cost Licence	-0.0195 (0.3)	-0.0306 (7.2)	-0.0304 (7.1)	-0.0276 (7.7)
Cost PAYG	-0.0772 (0.1)	-0.1471 (1.0)	-0.149 (1.4)	-0.1300 (1.7)
Cost Subscription	-0.0521 (0.4)	-0.0709 (5.5)	-0.070 (6.0)	-0.0561 (6.1)
Scale	1.59 (0.32) ^a	-	-	-
Log-Likelihood	-448.5	-448.7	-448.7	-452.6
Adjusted ²	0.113	0.115	0.119	0.125

Note: ^a t ratio with respect to one.

3 SURVEY FOR CASE STUDY 4 - ITS SOLUTIONS FOR BARCELONA'S LOCAL BUS NETWORK

3.1 EXECUTIVE SUMMARY OF THE SURVEY

The survey was conducted on the framework of COMPASS Case Study ITS Solutions for Barcelona Bus Network+.

The survey was carried out at different access points of Passeig de les Aigües de Barcelona+ on the 3rd of February of 2013, from 8 am till 5 pm (9 hours in total).

A total number of 533 surveys were obtained, 240 of which to bikers and 329 to pedestrians.

Passeig de les Aigües de Barcelona+ is located in the Tibidabo hills of Barcelona. It is a recreational path for bikers and hikers overlooking the city of Barcelona. The access to the Passeig de les Aigües+ is done through the mountain neighbourhoods of Barcelona, a set of districts characterised on the one hand for having difficult topographic conditions and relatively low population densities, which do not allow for regular bus services to be used, and on the other side for having an increasingly old population, eventually with some localised bags of poverty, which makes the provision of public transport service a matter of general interest.

This case study explores, among others, the possibility to increase the use of existing bus services in the mountain neighbourhoods of Barcelona with users that access Passeig de les Aigües+ for recreational purposes, eventually increasing ridership figures of these ad-hoc designed services.

The survey was focused on gaining knowledge of

- The citizens' awareness of the services that TMB offers today to improve the general bus services in Barcelona (orthogonal reorganisation of bus services, upgraded bus stops, TMB smart phone app),
- The citizens' awareness of the services that TMB (Barcelona's bus operator) offers to access the mountain neighbourhoods of Barcelona (neighbourhood buses),
- The willingness of citizens to pay for additional services provided with smart phone applications.

3.2 SURVEY CHARACTERISTICS

3.2.1 Survey Methodology

The Survey was conducted in the Passeig de les Aigües, in the Barcelona Tibidabo hills. The main characteristics of the Survey were as follows:

- Survey taking place on the 3rd of February 2013 (winter time). Sunny day.
- Survey taking place on from 8 am till 5 pm.
- Surveys were done at 10 points along Passeig de les Aigües
- Surveys were carried out in person by 10 interviewers
- 533 respondents, of which 240 were bikers and 329 were pedestrians
- The survey had 26 questions. 14 questions were common for bikers and pedestrians. 12 questions were specially adjusted depending if the respondent was a biker or a pedestrian (only minor changes) .
- Estimated response time: 3 to 5 minutes approximately.

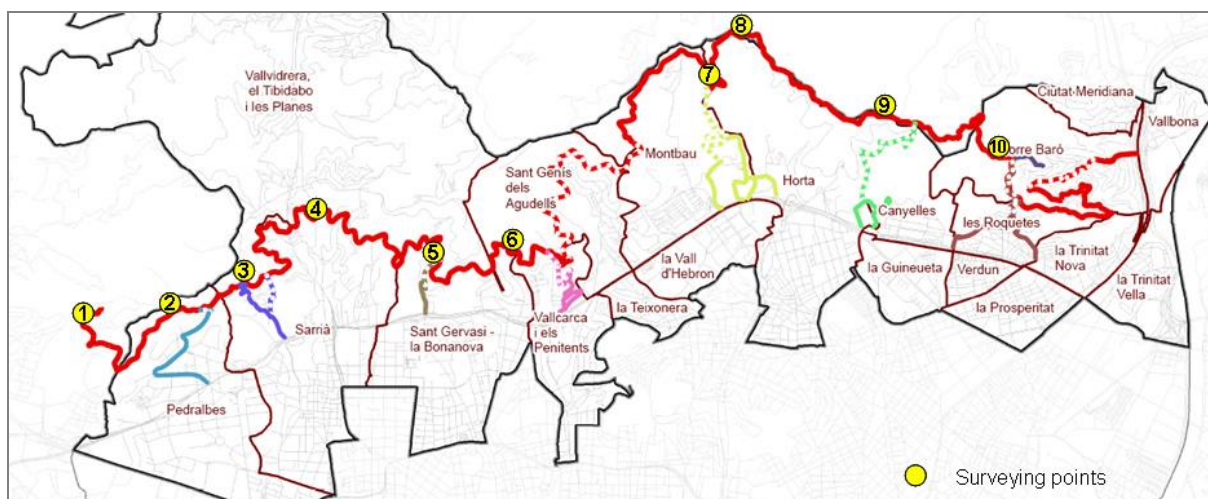


Figure 3-1 Surveying points at Passeig de les Aigües, Barcelona

Source: MCRIT, 2013

The contents of the Survey were as follows:

- Gender, age and neighbourhood (or municipality if outside Barcelona) where respondent lives (3 questions)
- Characteristics of the trip required to access the area of Passeig de les Aigües (11 questions):
 - Access point used to get to Passeig de les Aigües.
 - Trip purpose (strolling, sports, etc.).
 - Size of the group accompanying the surveyed person.
 - Frequency of the trip, average trip length (in time), approximate schedule of the trip.
 - Mode of transport used to access Passeig de les Aigües.
 - Questions related to parking for users accessing with private car.
- Level of awareness of existing initiatives and services by TMB for a more efficient and user friendly bus transport in Barcelona (7 questions):
 - Ongoing restructuration of the Barcelona urban bus network (2 questions).
 - TMB smart phone application providing real-time service information (3 questions).
 - Existing public transport services to mountain neighbourhoods (2 questions).
- Potential acceptance of new applications for smart phones, related to the following topics (5 questions):
 - Security and guidance.
 - DRT services from Barcelona to Passeig de les Aigües.
 - DRT from other areas of Tibidabo hills to major metropolitan transport stations (metro, suburban rail).
 - Mountain bike sharing services.
 - Parking booking applications.

3.2.2 Geographical Area Covered by the Survey Research

The *Passeig de les Aigües* (Water Pathway) is a pathway that links twenty Mountain Neighbourhoods of Barcelona. It is a long way (25 km) that crosses Tibidabo hills from East to West. The *Passeig de les Aigües* is very frequented at the weekends by bikers and pedestrians. Currently, Barcelona Council is upgrading the pathway and finalising some paths.

According to Barcelona Council, 750,000 pedestrians and bikers use this pathway, annually. According to the census, a weekend day 2,000 people access to the pathway.

The area surrounding Passeig de les Aigües covers the 20 mountain neighbourhoods of Barcelona, where today 250,000 people live (15% of Barcelona inhabitants).

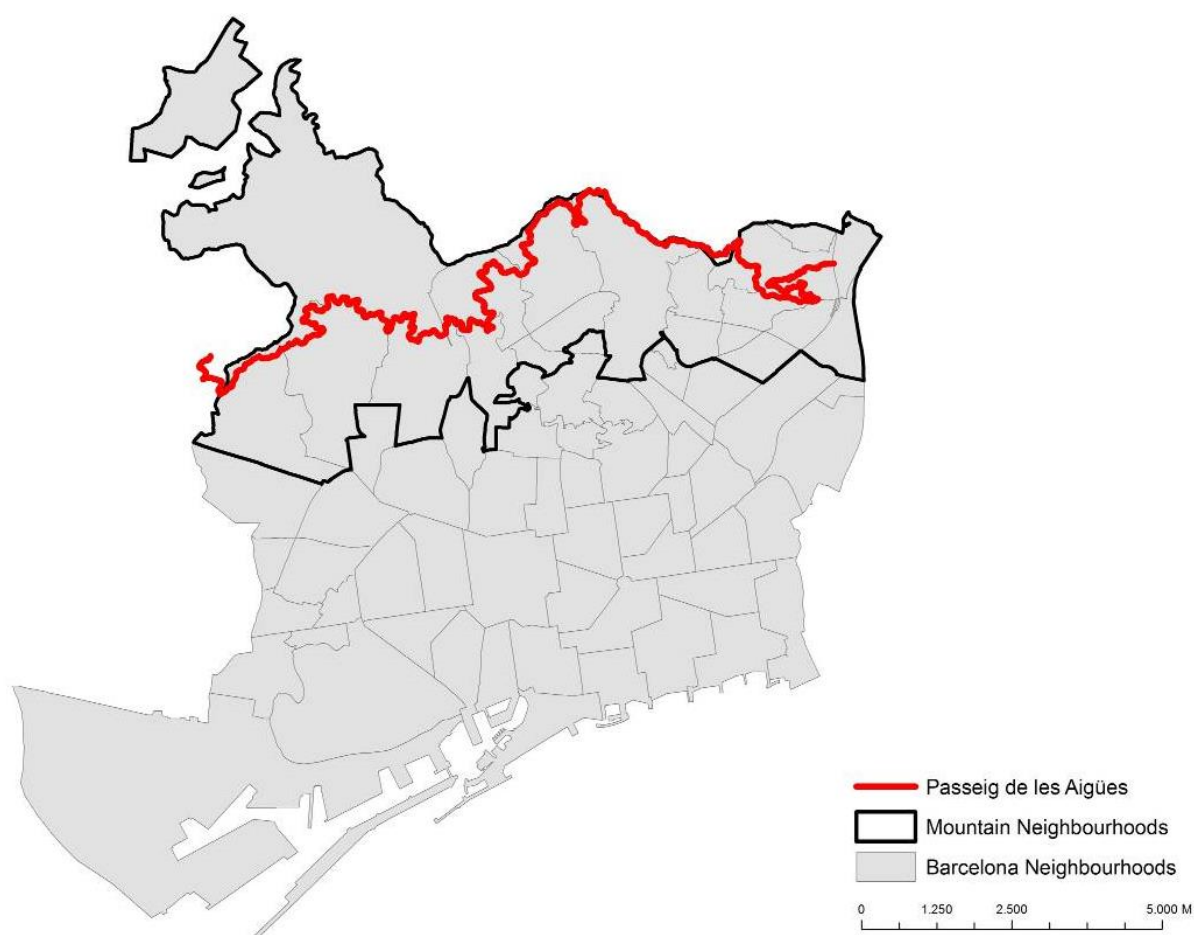


Figure 3-2 “Passeig de les Aigües” and mountain neighbourhoods within the Barcelona municipality. Geographic Coverage

Source: Mcrit, 2013

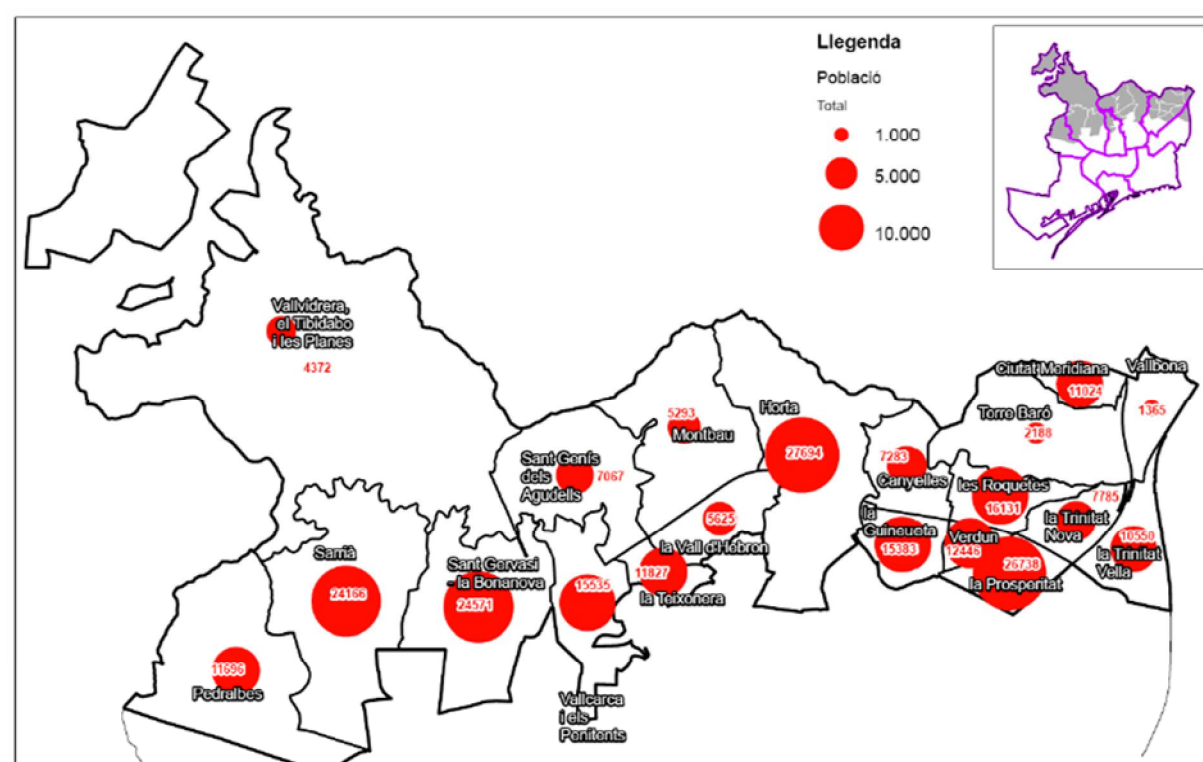


Figure 3-3 Population of Mountain Neighbourhoods of Barcelona

Source: Mcrit, 2013

Mountain Neighbourhoods are linked between them and the city through the Barcelona ring road (*Ronda de Dalt*). It is the main road to access all these areas with motorized modes. However, in some points, the ring road is a physical barrier to access by non motorized modes to Tibidabo hills. TMB, Barcelona bus operator, offers a dedicated service called neighbourhood bus (*Bus de Barri*) based on micro-buses that internally tour these neighbourhoods, linking their many areas with closest metro stations and stops to larger bus lines.

Today, it is difficult to access the *Rasseig de les Aigües* by Public Transport. The nearest metro stations are placed more than 0.5 km far, and the slope between *Rasseig de les Aigües* and these stations is often of more than 200 meters. Neighbourhood Buses don't provide service during the weekends, nor they reach the *Rasseig de les Aigües* itself during week days.

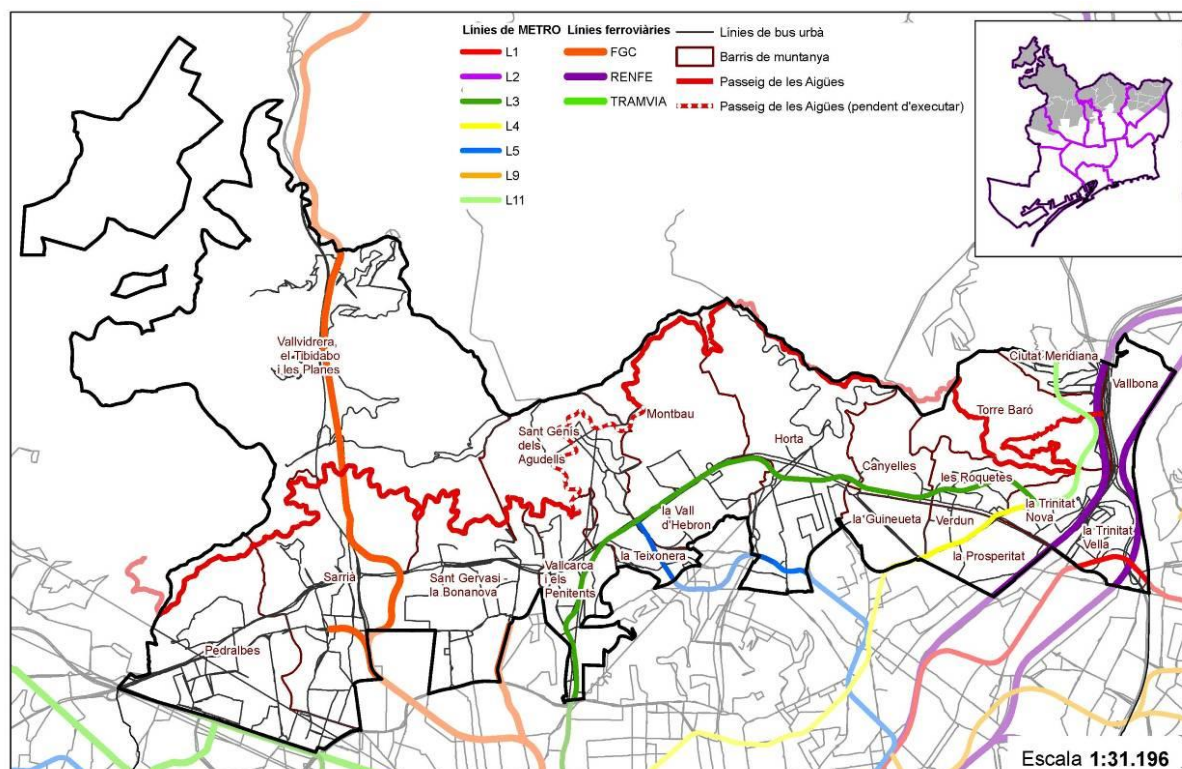


Figure 3-4 Metro lines and rail lines serving the Mountain Neighbourhoods

Source: Mcrit, 2013

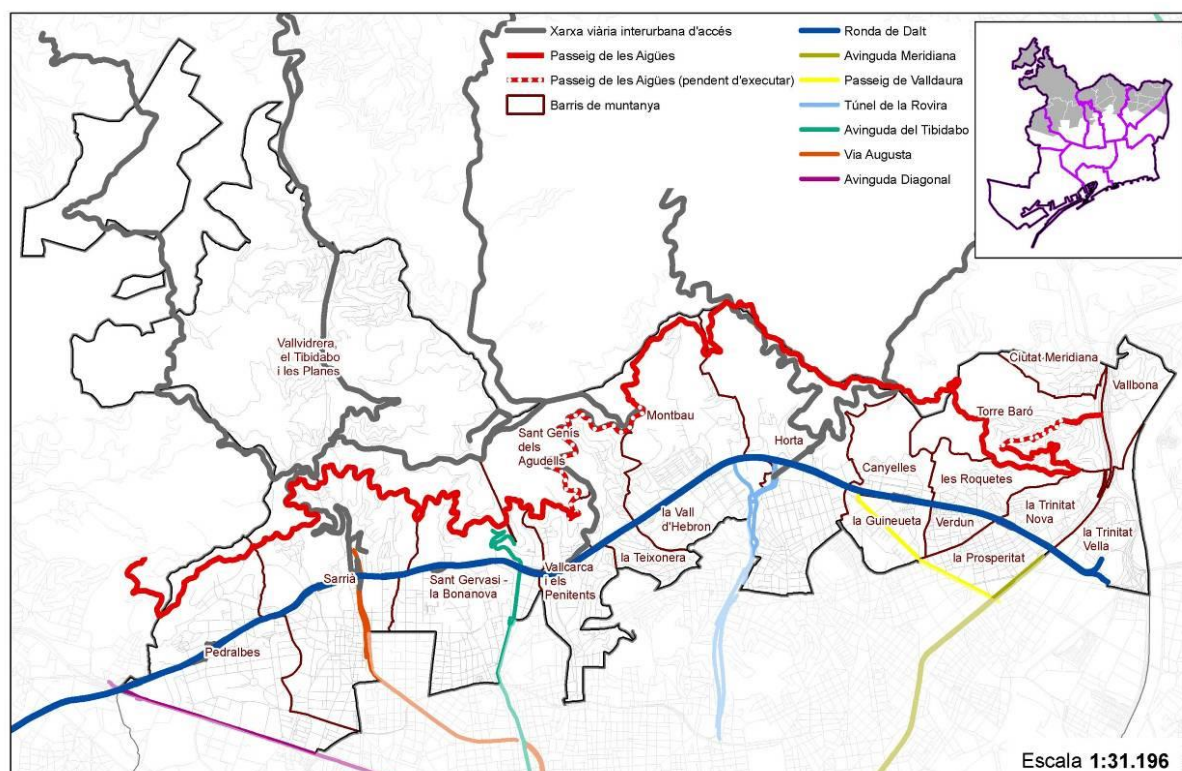


Figure 3-5 Major road axes providing access to Mountain Neighbourhoods (in blue ring road)

Source: Mcrit, 2013

Mountain neighbourhoods differ from the other neighbourhoods of the city as follows:

- Slopes are very important in most streets, and street width is often too narrow to allow the way for conventional 12 meter-long buses.



Figure 3-6 View of a Canyelles neighbourhood in Barcelona, and bus stop in the mountain neighbourhoods of Barcelona

Source: Google Street View, 2013

- Low population densities compared to other zones of the city. The average density of mountain neighbourhoods is 155 inhabitants per hectare, compared to 250 on average in the rest of the city. This reduces the margin of profit for public transport services in this area.

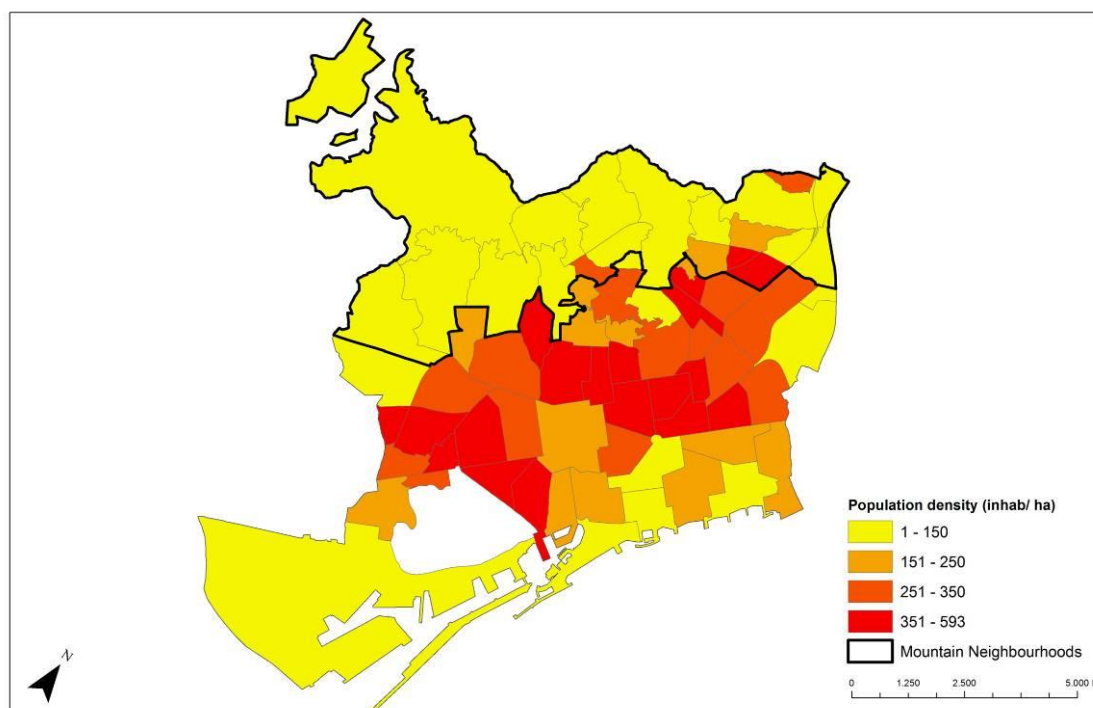


Figure 3-7 Barcelona population densities by neighbourhoods 2011

Source: Barcelona City Council, 2013

- Residents of mountain neighbourhoods are relatively older compared to the rest of the city. The ageing process is especially concentrated at the district of Horta . Guinardó (in gray). Older residents have fare discounts to purchase public transport tickets.

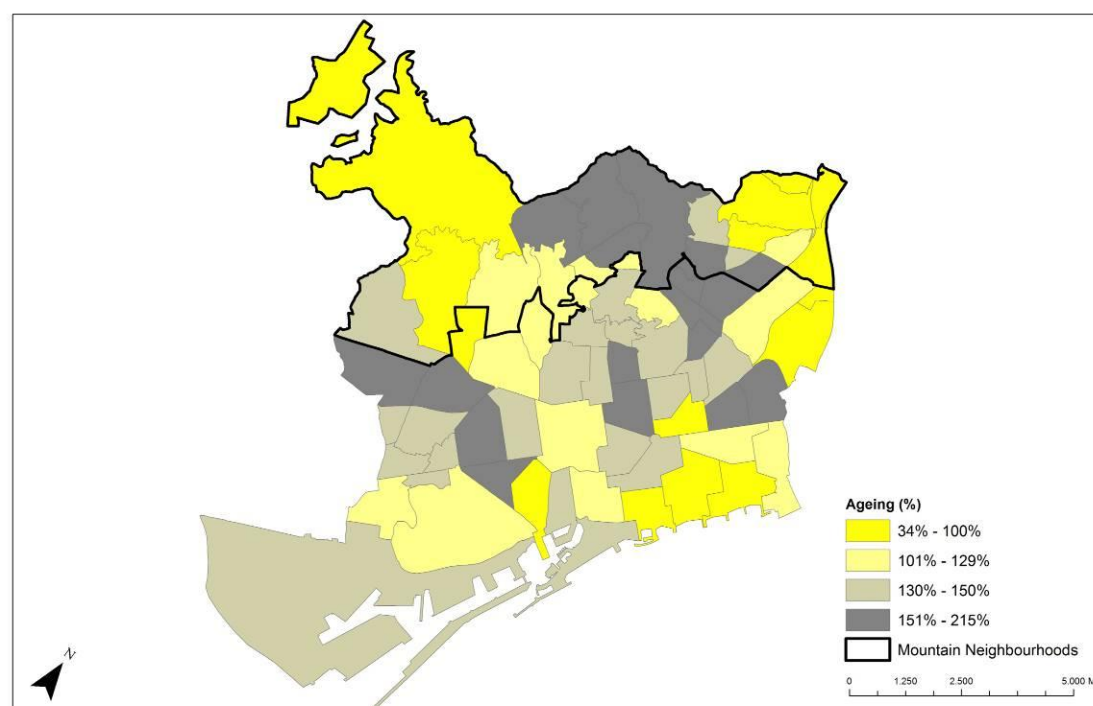


Figure 3-8 Ageing at Barcelona Neighbourhoods, 2009

Source: Barcelona City Council, 2013

- The level of wealth is much different from some neighbourhoods to others. Whereas western areas rank among the wealthiest of Barcelona, eastern areas are clearly under the municipal average.

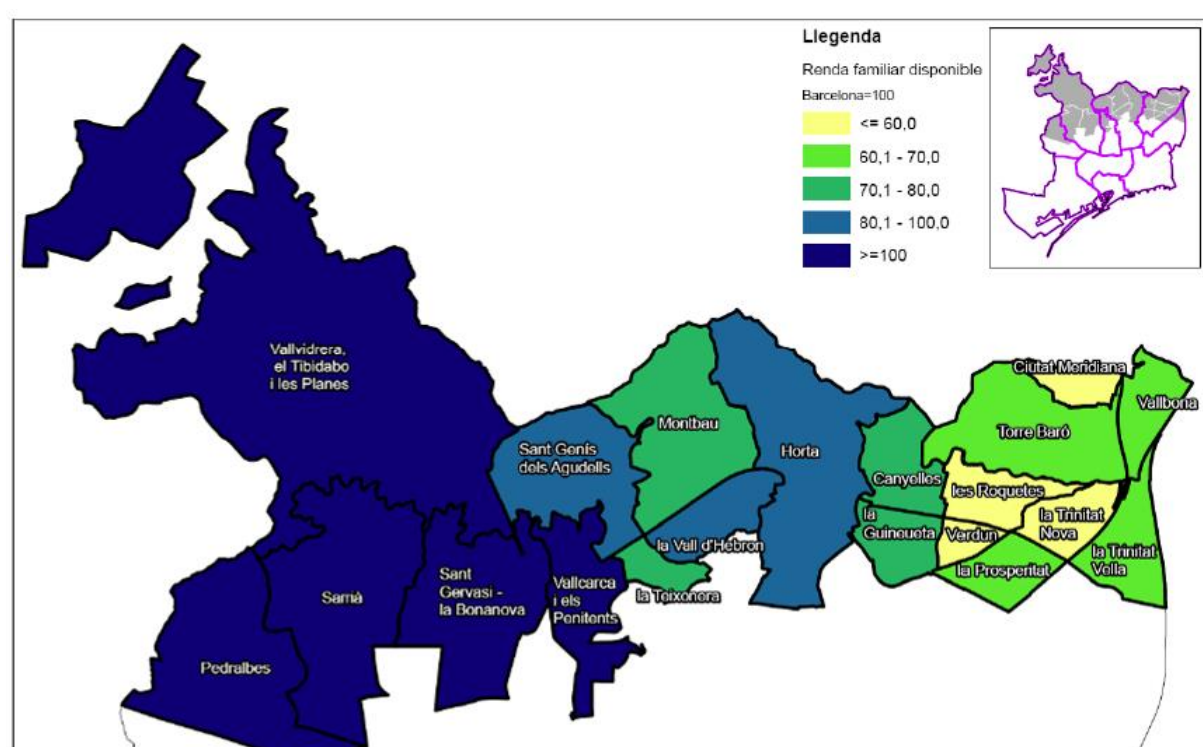


Figure 3-9 Available family income at Mountain Neighbourhoods (Barcelona average =100)

Source: Barcelona City Council, 2013

3.2.3 Respondents

- 533 respondents in total, 62% pedestrians and 38% were bikers.

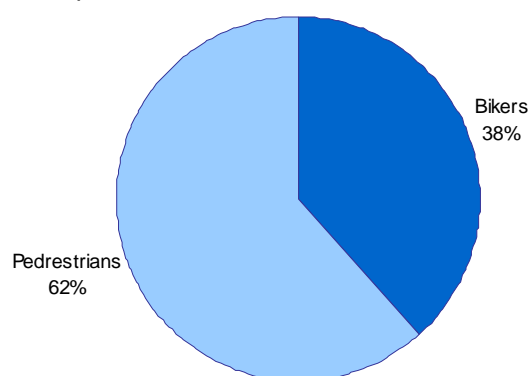


Figure 3-10 Type of respondents by activity (CS4 survey)

- 5% of respondents were men. Only 25% were women. 90% of bikers and 66% of pedestrians are men.

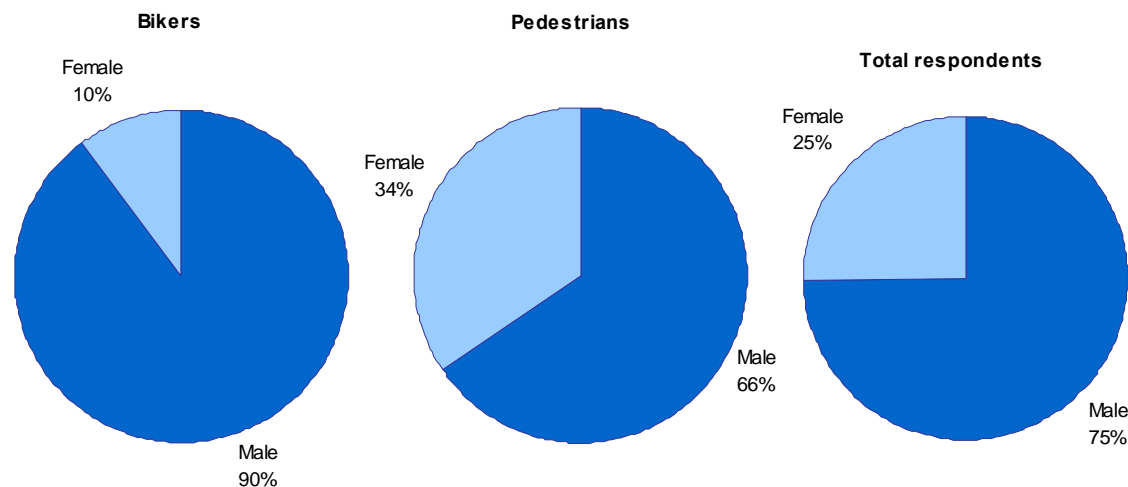


Figure 3-11 Sex of the pathway users by type of respondent: bikers (left), pedestrians (middle) and total respondents (right) (CS4 survey)

- 27% of respondents were aged between 30 . 40 years old, 28% were aged 40 . 50 years old and 21% of respondents were aged between 50 . 60 years old. No significant differences between bikers and pedestrian respondents.

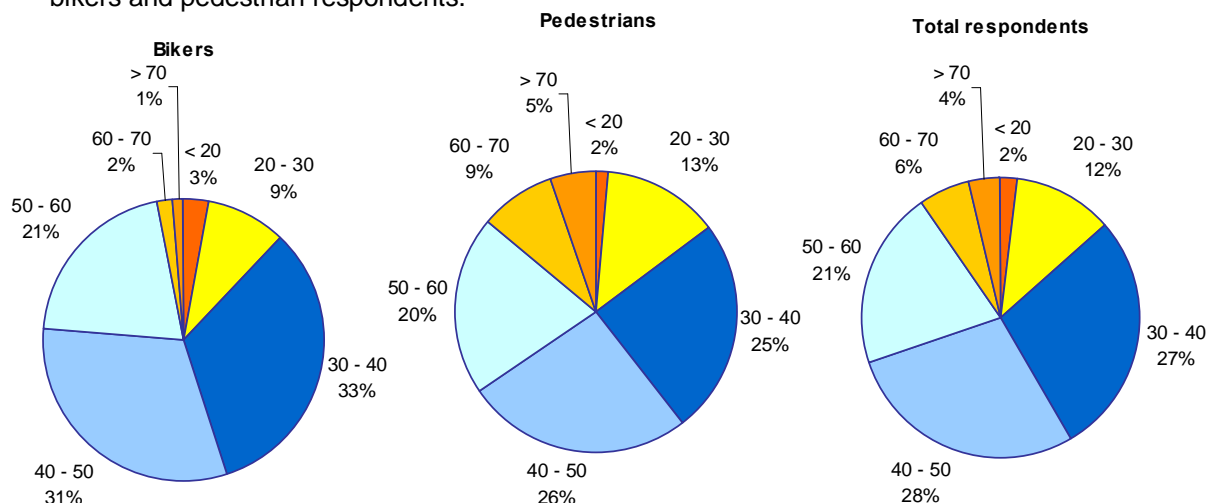


Figure 3-12 Age by type of respondent: bikers (left), pedestrians (centre) and average (right) (CS4 survey)

- 42% of respondents went alone to Passeig de les Aigües, 29% of respondents went with family and 29% of respondents went with group of adults. 37% of bikers went with friends and 37% of pedestrian respondents went with family.

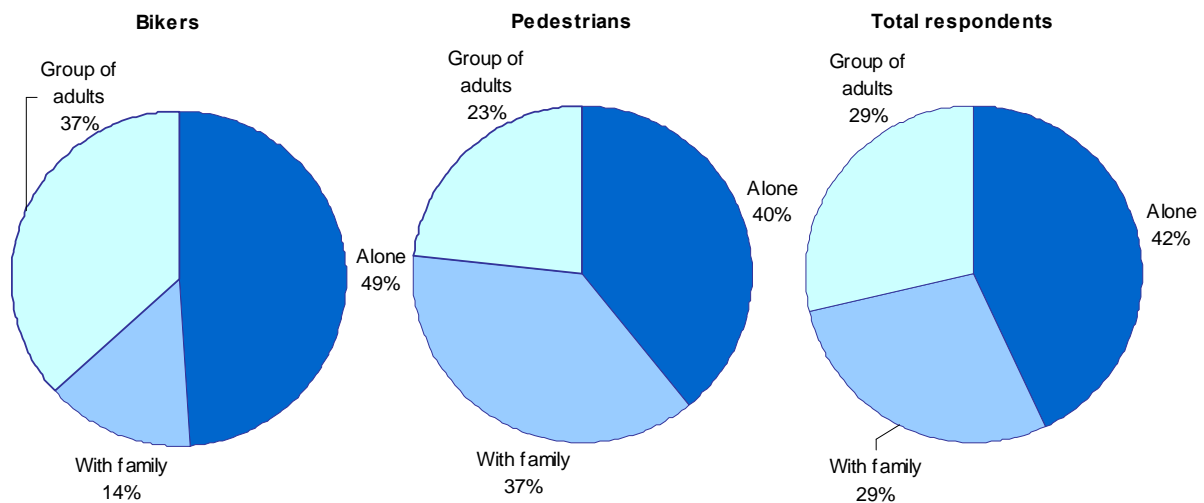


Figure 3-13 Type of group by type of respondents: bikers (left), pedestrians (middle) and total respondents (right) (CS4 survey)

- 63% of respondents went to Passeig de les Aigües to do sports (bike or jogging), 37% of respondents went to stroll. Majority of bikers (97%) respondents went for sports and majority of pedestrians respondents (59%) went to stroll.

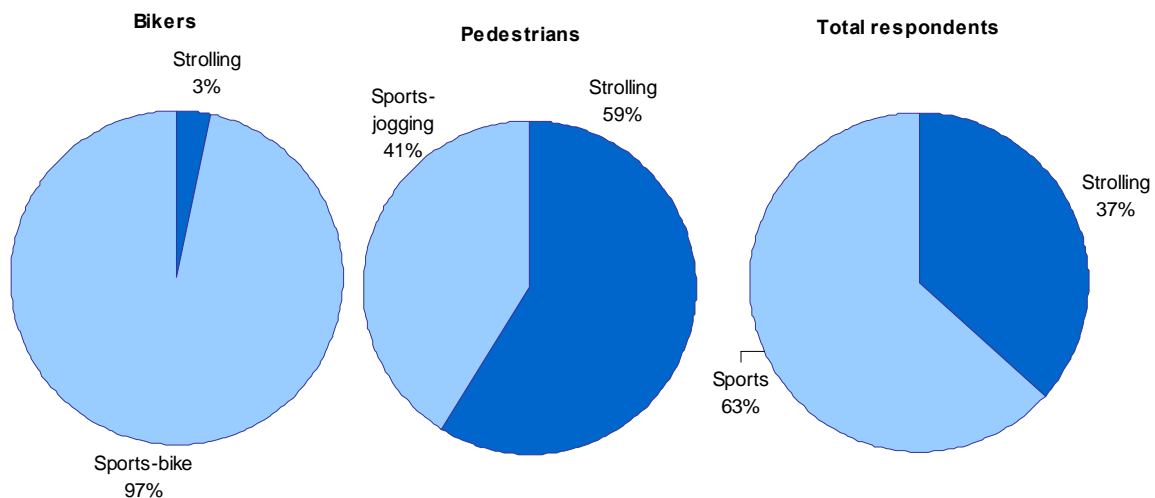


Figure 3-14 Trip purpose by type of respondent: bikers (left), pedestrians (middle) and total respondents (right) (CS4 survey)

- 77% of the trips were originated in Barcelona. More trips originated in Barcelona for pedestrians (82%) than for bikers (69%).

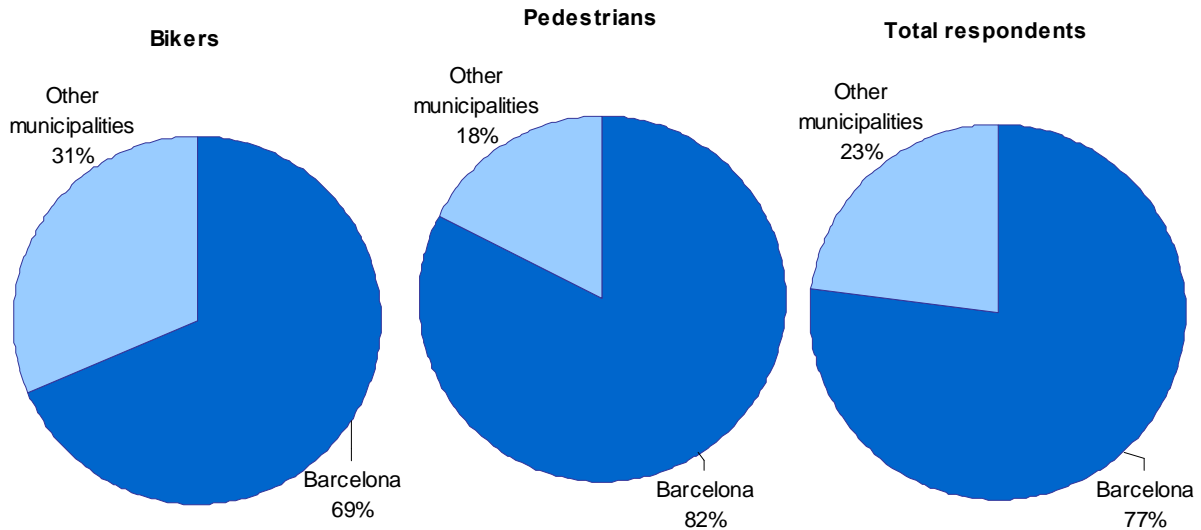


Figure 3-15 Origin of trip by type of respondent: bikers (left), pedestrians (middle) and total respondents (right) (CS4 survey)

- 68% of respondents from Barcelona were residents of the mountain neighbourhoods. Slightly higher in the case of pedestrians (73%) than for bikers (69%).

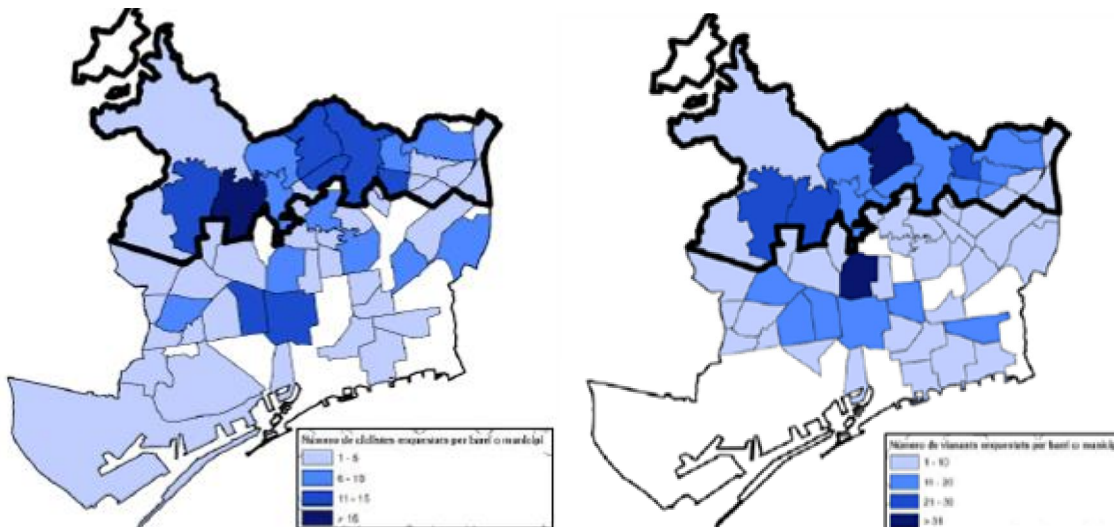


Figure 3-16 Origin of the trip for Bikers (left) and pedestrians (right) (CS4 survey)

- 54% respondents accessed Passeig de les Aigües walking or cycling and 39% of respondents used private motor vehicle. Only 7% of respondents used public transport to access to Passeig de les Aigües.
- Majority of bikers (81%) accessed to the pathway by cycling and 18% by car. Public transport was only used by 1% of bikers respondents.
- Pedestrians accessed to the pathway mostly by car (48%). 35% of pedestrians accessed walking. Compared to bikers respondents, public transport has a higher share (12%). Motorcycle was also listed with a significant percentage (5%).

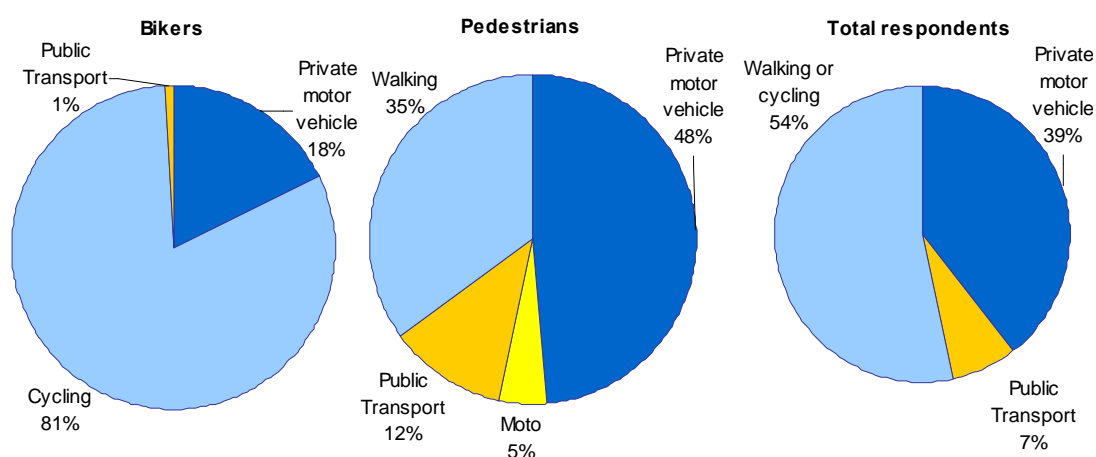


Figure 3-17 Modal split of access trips, by respondents type: bikers (left), pedestrians (middle) and average (right) (CS4 survey)

- 32% of the respondents who accessed by car to Passeig de les Aigües said that some times it was difficult to find available parking space at designated areas. Because of that, some users decided to illegally park their vehicles on the road hard shoulder (17%) or legally at the streets in the surrounding neighbourhoods (7%).

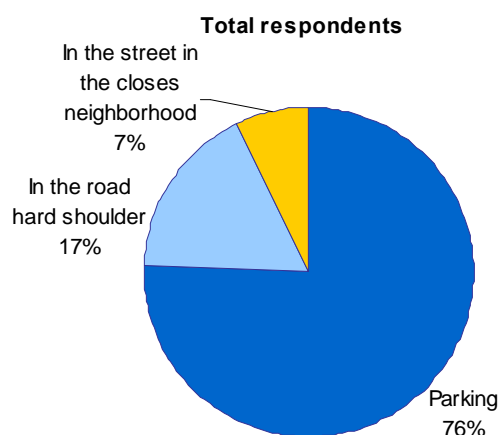


Figure 3-18 Park space, for respondents accessing by car (CS4 survey)

3.2.4 Solutions Considered

Respondents were asked about their level of awareness of services currently being offered by TMB. The following questions explicitly addressed this issue:

11. Do you own a smartphone?
12. Do you know the smartphone App by Barcelona Metropolitan Transport (TMB) that provides real-time information?
13. Do you use it regularly?
16. Are you aware of the public transport offer available to access the ~~pass~~ Passeig de les Aigües?
20. Do you usually use public transport?

21. Are you aware of the ongoing restructuration of the Barcelona urban bus network?

22. Are you aware of the neighborhood bus+service offered by TMB?

Respondents were asked about their willingness to pay for additional services based on smart phone applications. The following questions explicitly addressed this issue:

14. Would you pay " 80 cents for a smartphone app providing information about the Tibidabo mountain and eventually channelling user assistance in case of emergency?

17. Would you be willing to pay for a dedicated transport system for bikes (and passengers) from Barcelona to Rasseg de les Aigües+(with demand-responsive pick up points)?

18. Would you be willing to pay for a demand responsive pick up service from different areas of the Tibidabo mountain to the closest rail or metro station?

19. Would you be willing to use a mountain bike sharing system?

26. Would you be willing to pay to book a parking space using a smartphone app?

3.3 RESULTS

3.3.1 About the Bus Network Restructuration and Optimisation in Barcelona

Are you aware of the ongoing restructuring of the Barcelona urban bus network?

- Majority of respondents (59%) were aware of the ongoing restructuring of the Barcelona bus network. 41% of respondents were not aware of the process.
- Majority of respondents who were regular users of public transport (72%) were aware of the ongoing restructuring of orthogonal bus network. Only 34% respondents who used other transport modes (private car, cycling, and foot) were aware of the new orthogonal network.

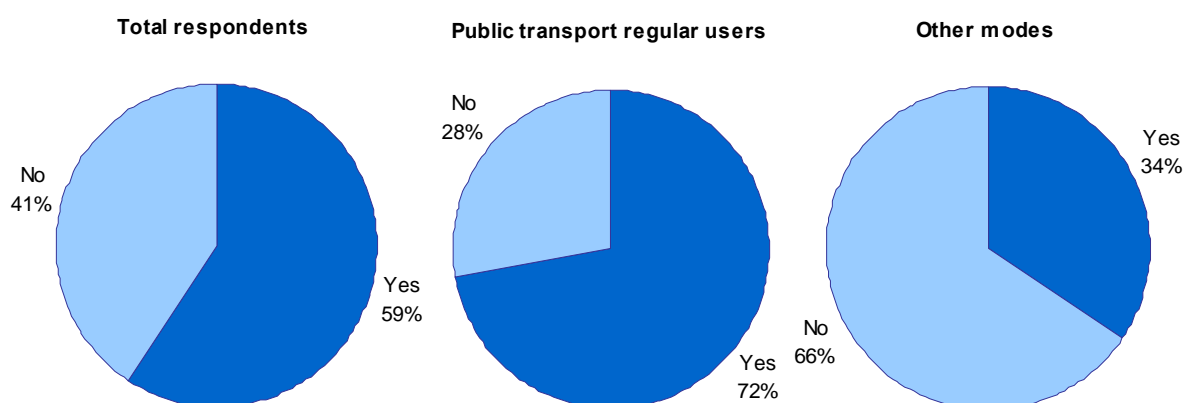


Figure 3-19 Awareness of bus restructuring and optimisation in Barcelona. Total users respondents (left), public transport regular users respondents (middle), other transport modes respondents (right) (CS4 survey)

3.3.2 About the TMB Smart Phone Application

Do you know the smartphone App by Barcelona Metropolitan Transport (TMB) that provides real-time information?

- 52% of respondents who owned a smart phone knew the TMB smart phone application.
- 55% of respondents who owned a smart phone and who used public transport regularly knew TMB smart phone application.
- Majority of respondents who didn't use public transport regularly and who owned a smart phone (53%) didn't know the APP by TMB.

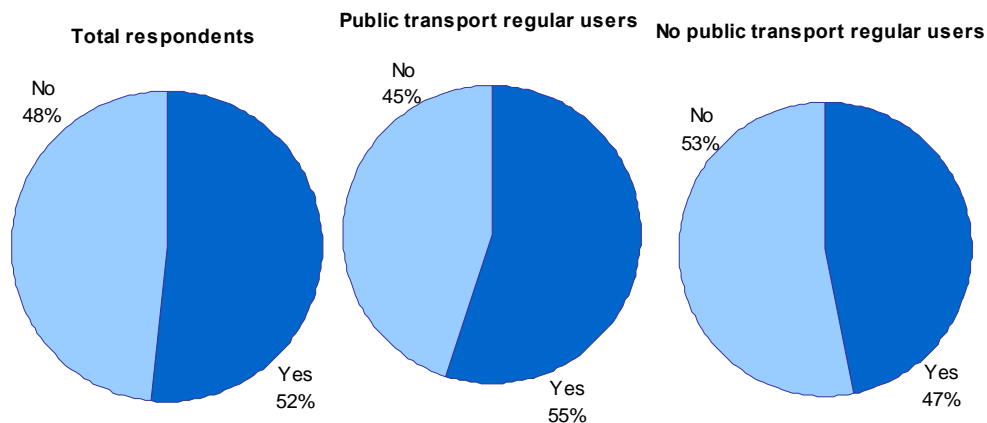


Figure 3-20 Awareness of TMB smart phone applications. Respondents who know smart phone applications by TMB that provides real-time information by type of user: total respondents (left), public transport regular user (middle), no public transport regular users (right) (CS4 survey)

Do you use it regularly?

- Only 16% of total respondents owned a smart phone, knew the TMB app and they used it regularly.

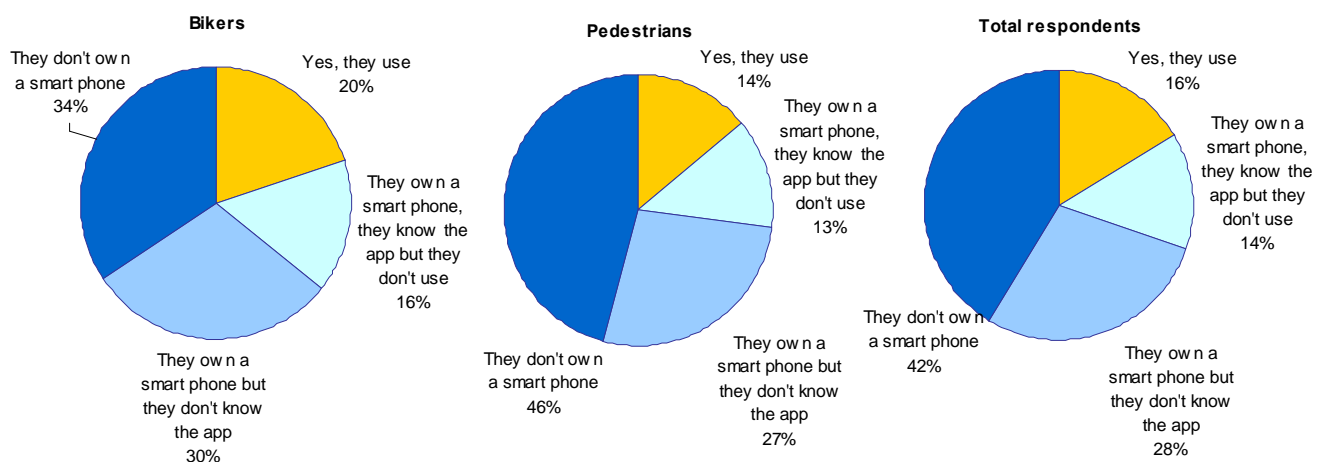


Figure 3-21 Use of TMB smart phone application. Respondents who uses regularly the TMB smart phone application by type of respondent: bikers (left), pedestrians (middle) and total respondents (right) (CS4 survey)

3.3.3 About the Service of the Neighbourhood Bus

Are you aware of the "Neighborhood Bus" service offered by TMB?

- Just 54% of respondents were aware of neighbourhood bus service that provides TMB. Barcelona residents respondents knew better this service, 66% of respondents who lived in Barcelona were aware of Neighbourhood bus service.

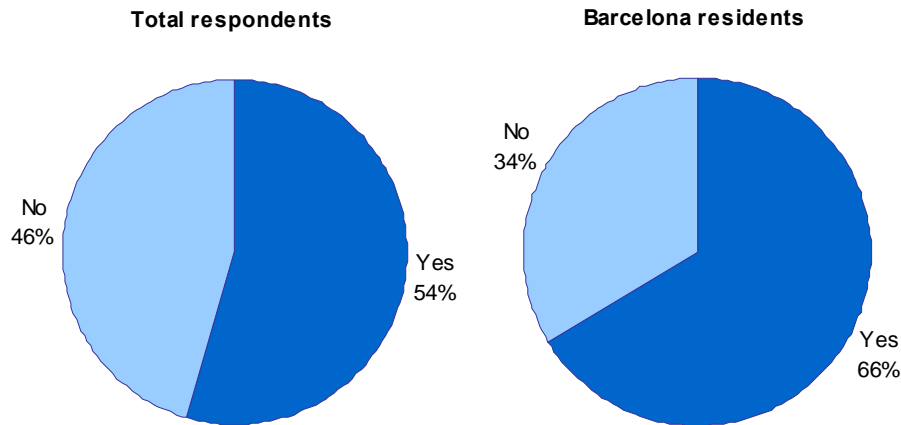


Figure 3-22 Awareness of the “Neighbourhood Bus” service offered by TMB (CS4 survey)

3.3.4 Willingness to Pay for Smart Phone Applications

The Survey is focused on know if users are willing to pay for Smart phone applications:

- Information and security application.
- Parking booking application.
- Rural bike sharing service.
- Demand Responsive Transport (DRT) service from and to Barcelona or closest metro/ train station.

Would you pay € 80 cents for a smartphone App providing information about the Tibidabo mountain and user assistance in case of emergency?

- 50% of respondents were willing to pay (80cents) for applications that could provide information about Tibidabo Mountain and user assistance in case of emergency. Bikers respondents would be more willing to pay in case of emergency than pedestrians (47%)

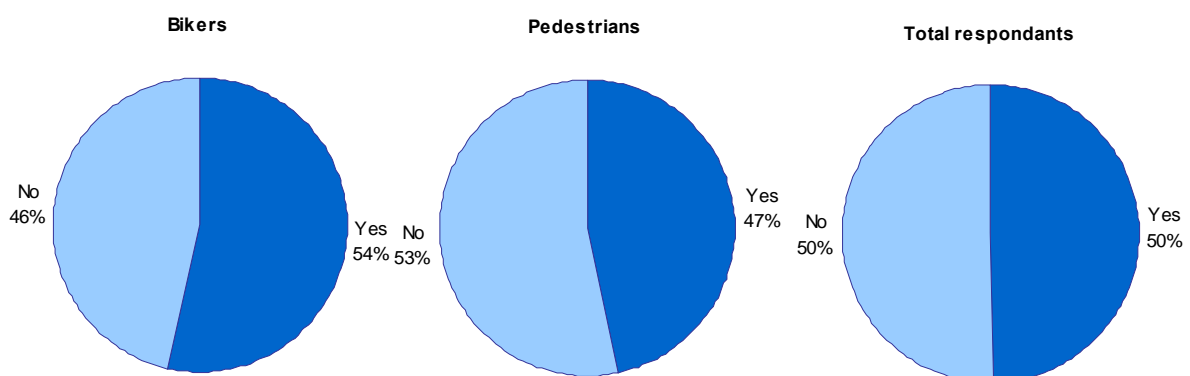


Figure 3-23 Willingness to pay information and security application: bikers respondents (left), pedestrians respondents (middle) and total respondents (right) (CS4 survey)

Would you be willing to pay for a demand responsive pick up service from Barcelona to “passeig de les Aigües” (with demand-responsive pick up points)?

- 68% of respondents would not be willing to pay for a demand responsive transport service from Barcelona to Passeig de les Aigües. Bikers respondents (79%) would be less willing to pay than pedestrian respondents (62%).

- 7% of pedestrians and 12% of bikers would be willing to pay 1" per trip, from a pick up point in Barcelona to Passeig de les Aigües.
- 21% of pedestrians and 12% of bikers would be willing to pay 2 euros per trip.
- 10% of pedestrians and 8% of bikers would be willing to pay 5 euros per trip.

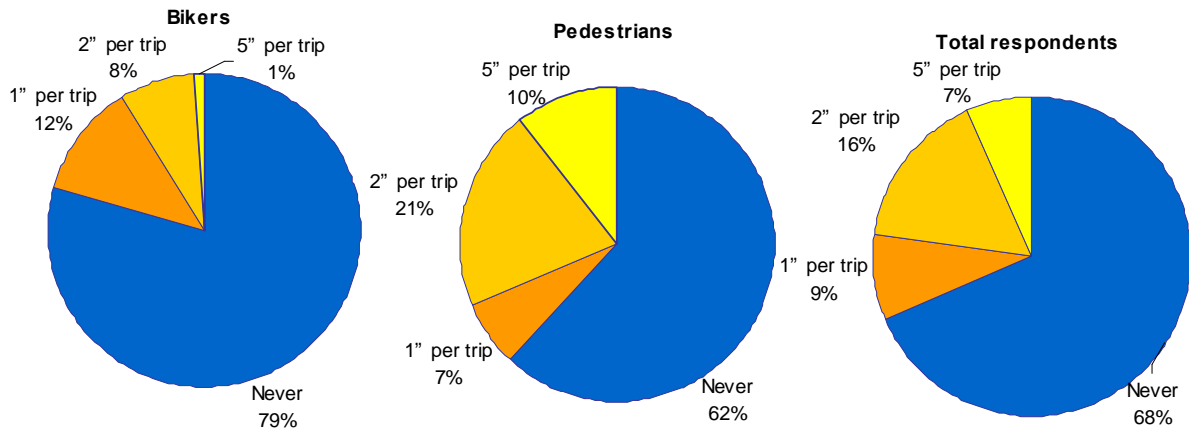


Figure 3-24 Willingness to pay for a demand responsive transport service from Barcelona to Passeig de les Aigües: bikers (left), pedestrians (middle) and total respondents (right) (CS4 survey)

Would you be willing to pay for a demand responsive pick up service from different areas of the Tibidabo Mountain to the closest rail or metro station?

- 70% of respondents would not be willing to pay for a demand responsive transport service from Barcelona to Passeig de les Aigües. Bikersrespondents (78%) would be less willing to pay than pedestrian respondents (65%).
- 14% of bikers respondents and 22% of pedestrians respondents would be willing to pay 1" per trip, from a pick up point to the closest rail or metro station to Passeig de les Aigües.
- 12% of pedestriansrespondents and 7% of bikersrespondents would be willing to pay up to 2 euros per trip.
- Only 1% of total respondents would be willing to pay up to 5 euros per trip.

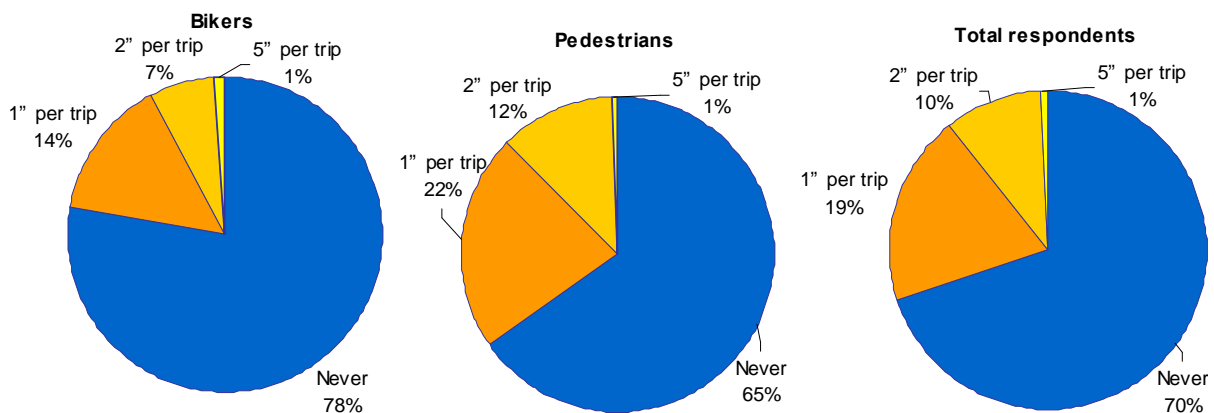


Figure 3-25 Willingness to pay for a demand responsive transport service from different areas of the Tibidabo Mountain to the closest rail or metro station: bikers (left), pedestrians (middle) and total respondents (right) (CS4 survey)

Would you be willing to use a mountain bike sharing system?

- 76 % of bikers respondents would not be willing to use bike sharing system for rural areas.

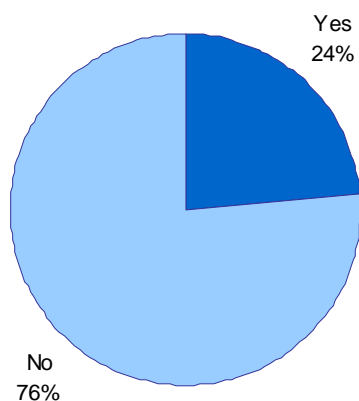


Figure 3-26 Willingness to use a mountain bike sharing system (CS4 survey)

Would you be willing to pay to book a parking space using a smartphone app?

- 82% of total respondents would not be willing to pay to book a parking area using a smart phone. 11% of respondents would be willing to pay up to 1" to, 6% of respondents would be willing to pay up to 2" per book. Only 1% of respondents would be willing to pay up to 3 euros per service.

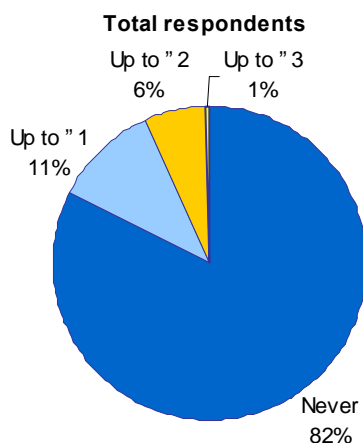


Figure 3-27 Willingness to pay to book a parking space using smart phone application (CS4 survey)

3.4 ANNEX: PICTURES



Figure 3-28 Typical steep and narrow streets in Barcelona's mountain neighbourhoods (I)

Source: Mcrit 2013

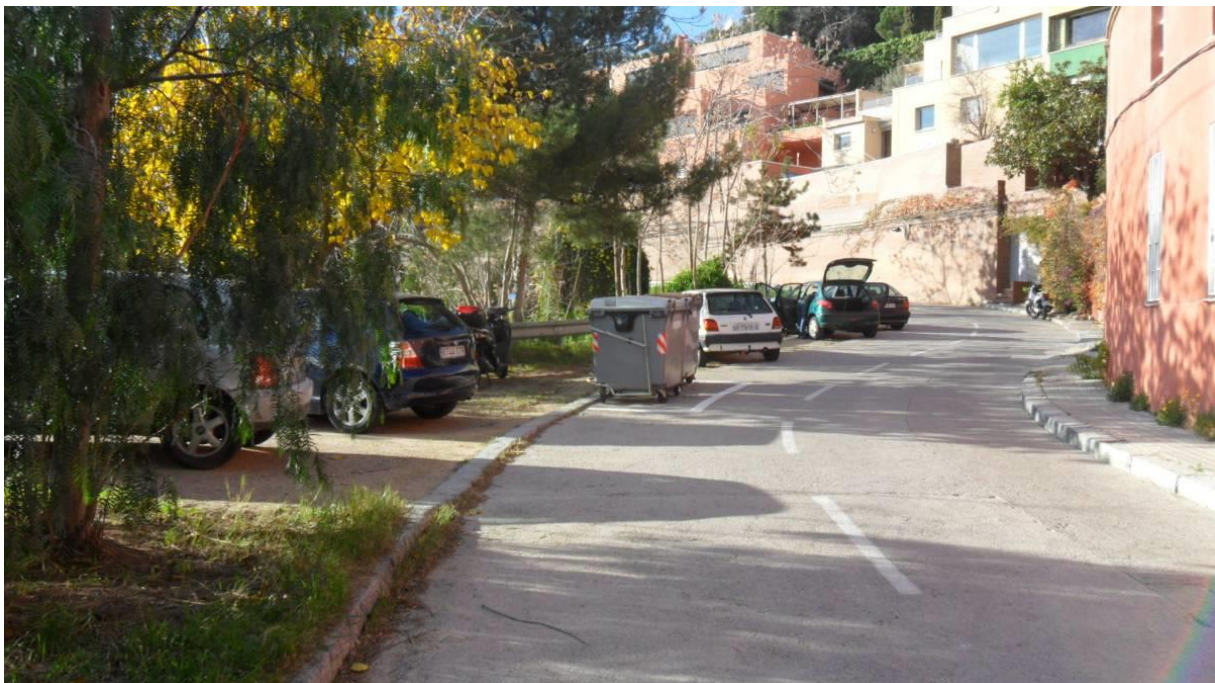


Figure 3-29 Typical steep and narrow streets in Barcelona's mountain neighbourhoods (II)

Source: Mcrit 2013



Figure 3-30 Typical steep and narrow streets in Barcelona's mountain neighbourhoods (III)

Source: Mcrit 2013



Figure 3-31 Surveying campaign in "Passeig de les Aigües"

Source: Mcrit 2013

4 SURVEY 1 FOR CASE STUDY 5 – FUTURE INTERURBAN PUBLIC TRANSPORT IN WARMINSKO-MAZURSKIE VOIVODSHIP

4.1 EXECUTIVE SUMMARY OF THE SURVEY

The quantitative survey conducted on representative group of users and non-users of public bus transport in warminsko-mazurskie region in Poland has been conducted in December 2012. This survey allowed to capture user behaviours and the perceived difficulties handicapping introduction of ITC solutions in rural areas. Acceptability of different ITC solutions among different user age groups and in regard to different distances travelled has been checked as well as user willingness to pay for ICTs if introduced. Also price elasticity have been tested. Again the responses are differentiated in regard to age and distance travelled. Possible effects on modal shift. In the area the only serious competitor of bus transport is private car. The user willingness to abandon their cars in favour of public bus in response to introduction of different ICTs has been tested. Again differentiation as per age and distance travelled has been taken into consideration. Finally the expected benefits in terms of comfort, safety increase and travel time, congestion and CO2 emissions were addressed. The results show that there is high acceptance for ICT introduction in the area. At the same time users are unwilling to pay for those solutions extra. This means that either transport company carries the burden of investment or the qualitative jump in transport quality due to ICTs is big enough to make local authorities fund ITCs. The most benefits are related to time savings and comfort increase. The congestion is not a significant factor while some CO2 emission reduction could be expected.

4.2 SURVEY CHARACTERISTICS

4.2.1 Survey Methodology

This study has been conducted on the basis of field research employing the PAPI (interviewing with printed questionnaire) method. Sample size was 300 of with majority (266) represented travellers whose primary residence is in Szczytno region while the remaining 34 respondents were from outside of the region. The sample type was random however certain balanced characteristics of the sample were maintained (representativeness of gender, age groups etc.). The survey was conducted between 27.11.2012 . 30.11.2012. In part at bus stops but mostly during the travel by bus. There was an agreement with transport service provider (bus company) which allowed to conduct this work on-board, therefore responses are well thorough as respondents were not in particular hurry.

4.2.2 Geographical Area Covered by the Survey Research

The area of the survey is Szczytno region in the warminsko-mazurskie voivodship North-Eastern part of Poland. This is low GDP rural area. It has about 25,000 inhabitants, while in the close vicinity of Szczytno area (powiat) lives about 70,000 people for whom Szczytno is centre of gravity. The survey area is the same as the attempted case study area.



Figure 4-1 Szczytno region in the North-Eastern part of Poland

Source: maps.google.pl

The transport network at the area is rather underdeveloped. There road network constitutes the three national roads:

- No 53 (Olsztyn-Ostrojka).
- No 57 (Bartoszyce-Pułtusk).
- No 58 (Olsztyn-Szczuczyn).

There is also one voivodship level road - no 600 (Szczytno-Mragowo) and few local roads. There is a railway connection from Szczytno to Olsztyn and Ełk (line no 219). Two local lines (no 35 to Ostrojka and no. 262 to Biskupiec) have been disconnected from the network by PKP (Polish State Railways). However there is an international airport in the area . Szczytno-Szymany which is 7km from Szczytno. However this airport is for occasional rather than regular flights.

4.2.3 Respondents

The sample is balanced in regard to sex and age. There is close to equal number of men and women questioned and representation of 5 age groups. The division into age groups is based on the assumption that age group has important influence on travel behaviours and ability to pay for extra ITC features:

- To the 15-18 group belong mainly those who travel to/from school.
- To the 19-29 group belong those studying or already working but usually this age range represents early years of the professional carrier.
- To the 30-45 group belong those who are in the middle years of professional carrier and usually have stabilized personal life.

- 45-60 group represent people past carrier mid-point with stable income sources and nearing the retirement age.
- 60+ are mostly retired people.

Table 4-1 Survey sample differentiation in regard to gender (CS5 survey)

Sex	Number	Share
Men	126	42%
Women	174	58%
Total	300	100%

Table 4-2 Survey sample differentiation in regard to age (CS5 survey)

Age	Number	Share
15-18	50	16,8%
19-29	67	22,4%
30-45	73	24,4%
46-60	69	22,8%
60+	41	13,6%
Total	300	100,0%

Division by education is representative to the general education profile of the society.

Table 4-3 Survey sample differentiation in regard to education (CS5 survey)

Education	Number	Share
Primary	64	21,2%
Vocational	83	27,6%
Secondary	98	32,8%
Higher	55	18,4%
Total	300	100,0%

4.2.4 Solutions Considered

ICT solutions surveyed in this case are:

1. Internet based travel planners.
2. Electronic real-time information at bus stops.
3. Ticket purchasing via mobile phones / internet.
4. Real-time information on services via mobile phones / internet.
5. Real-time information on estimated arrival times, stops, route on board of vehicles.
6. Demand responsive services - possibility for direct pick-up/delivery of passengers in response to prior demand.

4.3 RESULTS

4.3.1 Internet or Mobile Phone Based Travel Planners

The usefulness of internet or mobile phone accessible travel planner in division by different distance user groups is given in table below.

Table 4-4 Acceptance of internet or mobile phone based travel planners by different distance travellers (CS5 survey)

Usefulness	Local	Within voivodship >40km	Long distance	Totals
Useless	26,4%	4,7%	10,4%	19,6%
Little usefulness	9,4%	7,0%	2,1%	7,6%
Rather useful	30,2%	30,2%	27,1%	29,6%
Very useful	28,9%	44,2%	41,7%	34,0%
Necessary	5,0%	14,0%	18,8%	9,2%

The same question in division of different user groups produces following acceptance levels:

Table 4-5 Acceptance of internet or mobile phone based travel planners by different age groups (CS5 survey)

Usefulness	15 -18	19 -29	30 - 45	46 -60	60+	Totals
Useless	0,0%	1,8%	11,5%	33,3%	64,7%	19,6%
Little usefulness	2,4%	8,9%	6,6%	14,0%	2,9%	7,6%
Rather useful	40,5%	25,0%	27,9%	29,8%	26,5%	29,6%
Very useful	47,6%	41,1%	44,3%	22,8%	5,9%	34,0%
Necessary	9,5%	23,2%	9,8%	0,0%	0,0%	9,2%
n=	50	67	73	69	41	300

Willingness to pay could be considered in relation to both distance and age producing the following results:

Table 4-6 Willingness to pay for internet or mobile phone based travel planners (CS5 survey)

Additional payment acceptance	Distance				Age					
	Local	Within voivodhi p >40km	Long distance	Totals	15 -18	19 -29	30 -45	46 -60	60+	Totals
yes	18,2 %	32,6%	31,3%	23,2%	38,1%	33,9 %	21,3 %	14,0 %	5,9%	23,2 %
no	81,8 %	67,4%	68,8%	76,8%	61,9%	66,1 %	78,7 %	86,0 %	94,1 %	76,8 %

For those expressing the will to pay price elasticity has been tested.

Table 4-7 Price elasticity - internet or mobile phone based travel planners (CS5 survey)

Additional cost accepted	Distance				Age					
	Local	Within voivodshi p >40km	Long distance	Totals	15 -18	19 -29	30 -45	46 -60	60+	Totals
1 PLN	62,1 %	21,4%	33,3%	44,8%	56,3 %	21,1%	38,5%	75,0%	100,0 %	44,8%
2 PLN	31,0 %	78,6%	40,0%	44,8%	37,5 %	57,9%	61,5%	12,5%	0,0%	44,8%
5 PLN	6,9%	0,0%	26,7%	10,3%	6,3 %	21,1%	0,0%	12,5%	0,0%	10,3%

Finally the effects of the solution on possible modal shift could be predicted based on respondents attitudes. Among those who have access to passenger car possible effects of internet (and/or mobile phone) based travel planner application has been tested with below results:

Table 4-8 Expected modal shift after introduction of internet or mobile phone based travel planners (CS5 survey)

Shift to bus	Distance				Age					
	Local	Within voivodship >40km	Long distance	Totals	15 -18	19 -29	30 - 45	46 -60	60+	Totals
definitely not	25,9%	31,3%	17,6%	25,3%	4,0%	24,4%	23,4%	28,9%	52,6%	25,3%
rather not	33,3%	25,0%	26,5%	30,5%	20,0%	20,0%	34,0%	42,1%	36,8%	30,5%
sometimes	24,1%	12,5%	23,5%	21,8%	28,0%	26,7%	27,7%	15,8%	0,0%	21,8%
probably yes	15,7%	31,3%	29,4%	21,3%	48,0%	24,4%	14,9%	13,2%	10,5%	21,3%
definitely yes	,9%	0,0%	2,9%	1,1%	0,0%	4,4%	0,0%	0,0%	0,0%	1,1%

For the Internet based travel planners the following general patterns emerge from the population research study:

- Travel planners are considered very useful tool. There is no big difference between local , medium and long distance users although local users are least interested. This is mainly due to the characteristics of local travel . higher frequency and good familiarity with the service. Local users have in majority memorized timetables due to frequency off use. Highest acceptance is among younger user groups while older users tend to be more reluctant most likely due to the lack of sufficient knowledge of Internet/mobile phone technology.
- The willingness to pay extra for this solution is rather low but is increasing with the distance considered. The same could be said about age groups. The highest willingness to pay is observed among 15-18 year olds followed by 19-29 and decreasing steadily as age range increases.
- Even those willing to pay for introduction of this solution majority accepts only smallest amount (up to 1 PLN)
- There is surprisingly high predicted effect in relation to modal change. Although only small fraction of users declares absolute switch to bus from car use but as many as 21,3% declare probable change of mode. The willingness to change increases with distance travelled which is in line with the increasing difference between unit price per km of travel between car and bus.

4.3.2 Electronic Real-time Information at Bus Stops

The usefulness of electronic information at bus stops provided in real-time in division by different distance user groups is given in table below.

Table 4-9 Acceptance of electronic real-time information at bus stops by different distance passengers (CS5 survey)

Usefulness	Local	Within voivodship >40km	Long distance	Totals
Useless	14,5%	2,3%	14,6%	12,4%
Little usefulness	9,4%	4,7%	8,3%	8,4%
Rather useful	34,0%	46,5%	27,1%	34,8%
Very useful	36,5%	32,6%	41,7%	36,8%
Necessary	5,7%	14,0%	8,3%	7,6%

The user response to the proposed solution also differs by age.

Table 4-10 Acceptance of electronic real-time information at bus stops by different age groups (CS5 survey)

Usefulness	15 -18	19 -29	30 - 45	46 -60	60+	Totals
Useless	4,8%	5,4%	6,6%	15,8%	38,2%	12,4%
Little usefulness	4,8%	14,3%	8,2%	8,8%	2,9%	8,4%
Rather useful	38,1%	37,5%	32,8%	31,6%	35,3%	34,8%
Very useful	38,1%	28,6%	50,8%	38,6%	20,6%	36,8%
Necessary	14,3%	14,3%	1,6%	5,3%	2,9%	7,6%
n=	50	67	73	69	41	300

The users represent different willingness to pay depended both on type of travel by distance and by user age.

Table 4-11 Willingness to pay for electronic real-time information at bus stops (CS5 survey)

Additional payment acceptance	Distance				Age					
	Local	Within voivodship >40km	Long distance	Totals	15 -18	19 -29	30 - 45	46 -60	60+	Totals
yes	20,1%	27,9%	8,3%	19,2%	28,6%	19,6%	18,0%	19,3%	8,8%	19,2%
no	79,9%	72,1%	91,7%	80,8%	71,4%	80,4%	82,0%	80,7%	91,2%	80,8%

Among those who are willing to pay extra for real-time information at bus stops there are few willing to pay substantial amount.

Table 4-12 Price elasticity - electronic real-time information at bus stops (CS5 survey)

Additional cost	Distance				Age					
	Local	Within voivodship >40km	Long distance	Totals	15 -18	19 -29	30 - 45	46 -60	60+	Totals
1 PLN	75,0%	66,7%	75,0%	72,9%	66,7%	81,8%	54,5%	81,8%	100,0%	72,9%
2 PLN	15,6%	33,3%	0,0%	18,8%	25,0%	9,1%	27,3%	18,2%	0,0%	18,8%
5 PLN	6,3%	0,0%	25,0%	6,3%	8,3%	9,1%	9,1%	0,0%	0,0%	6,3%
More than 5 PLN	3,1%	0,0%	0,0%	2,1%	0,0%	0,0%	9,1%	0,0%	0,0%	2,1%

Possible positive impact on modal shift resulting in flow of car users to bus service has been measured.

Table 4-13 Expected modal shift after introduction of electronic real-time information at bus stops (CS5 survey)

Shift to bus	Distance				Age					
	Local	Within voivodship >40km	Long distance	Totals	15 -18	19 -29	30 - 45	46 -60	60+	Totals
definitely not	23,1%	12,5%	23,5%	21,3%	8,0%	26,7%	17,0%	21,1%	36,8%	21,3%
rather not	22,2%	6,3%	29,4%	20,7%	16,0%	20,0%	21,3%	28,9%	10,5%	20,7%
sometimes	25,0%	34,4%	20,6%	25,9%	36,0%	24,4%	23,4%	21,1%	31,6%	25,9%
probably yes	27,8%	43,8%	23,5%	29,9%	36,0%	24,4%	38,3%	26,3%	21,1%	29,9%
definitely yes	1,9%	3,1%	2,9%	2,3%	4,0%	4,4%	0,0%	2,6%	0,0%	2,3%

For the real-time at bus electronic information services there are several trends that could be identified based on user responses analysis:

- Real-time information is considered useful or very useful by ¾ of users. At the same time only about 8% finds this service necessary. The solution scores highest between medium distance travellers. The age plays significant role in evaluation of its usefulness. Although general pattern of higher acceptance among younger user groups is dominant (if counted as totals of positive versus negative answers) there is significant jump in very useful marking within the 30-45 year old group. This group represent mostly daily commuters . people going to/from work for whom delays play significant role.
- The above observation is not accompanied by increased willingness to pay among this group of users. Highest willingness is attributed to the youngest users (more than 285 willing to pay) while average remains at less than 20%. This solution is generally considered as something that service provider should deliver within the price of the service.
- Within those accepting payments only 6% is willing to pay as much as 5 PLN and 2% more than that. ¾ of the population accepts additional payments not exceeding 1 PLN.
- The potential for modal shift is limited in terms of certain switchers. Those amount to only slightly above 2%. There is a group of users who are likely to resign from private car in favour of bus (30%) but majority remains reluctant.

4.3.3 Ticket Purchasing via Mobile Phone/Internet

The usefulness of electronic ticket in regard to different distance travellers could be described as rather high.

Table 4-14 Acceptance of ticket purchasing via mobile phone/internet among different distance passengers (CS5 survey)

Usefulness	Local	Within voivodship >40km	Long distance	Totals
Useless	37,7%	11,6%	14,6%	28,8%
Little usefulness	26,4%	14,0%	8,3%	20,8%
Rather useful	25,2%	53,5%	27,1%	30,4%
Very useful	8,8%	14,0%	31,3%	14,0%
Necessary	1,9%	7,0%	18,8%	6,0%

The acceptance by transport users in regard to age groups could be described in the following way:

Table 4-15 Acceptance of ticket purchasing via mobile phone/internet by different age groups (CS5 survey)

Usefulness	15 -18	19 -29	30 - 45	46 -60	60+	Totals
Useless	16,7%	10,7%	18,0%	43,9%	67,6%	28,8%
Little usefulness	45,2%	10,7%	19,7%	15,8%	17,6%	20,8%
Rather useful	21,4%	37,5%	41,0%	28,1%	14,7%	30,4%
Very useful	9,5%	30,4%	14,8%	8,8%	0,0%	14,0%
Necessary	7,1%	10,7%	6,6%	3,5%	0,0%	6,0%
n=	50	67	73	69	41	300

The willingness to pay extra for the access to the electronic ticket solution has different acceptance levels among short and long distance travellers as well as among different age groups.

Table 4-16 Willingness to pay for ticket purchasing via mobile phone/internet (CS5 survey)

Additional payment acceptance	Distance				Age					
	Local	Within voivodship >40km	Long distance	Totals	15 -18	19 -29	30 - 45	46 -60	60+	Totals
yes	14,5%	25,6%	37,5%	20,8%	19,0%	37,5%	21,3%	14,0%	5,9%	20,8%
no	85,5%	74,4%	62,5%	79,2%	81,0%	62,5%	78,7%	86,0%	94,1%	79,2%

Among those 20.8% of users who are inclined to pay extra for availability of electronic ticket there are really few who accept higher than 1 PLN cost associated with this solution.

Table 4-17 Price elasticity - ticket purchasing via mobile phone/internet (CS5 survey)

Additional cost	Distance				Age					
	Local	Within voivodship >40km	Long distance	Totals	15 -18	19 -29	30 - 45	46 -60	60+	Totals
1 PLN	56,5%	63,6%	38,9%	51,9%	50,0%	42,9%	53,8%	62,5%	100,0%	51,9%
2 PLN	13,0%	36,4%	38,9%	26,9%	25,0%	38,1%	15,4%	25,0%	0,0%	26,9%
5 PLN	30,4%	0,0%	22,2%	21,2%	25,0%	19,0%	30,8%	12,5%	0,0%	21,2%

Potentiality for modal shift in case electronic ticketing is introduced by current bus operator is limited but clearly judging by the number of probable or occasional switchers there are opportunities.

Table 4-18 Expected modal shift after introduction of ticket purchasing via mobile phone/internet (CS5 survey)

Shift to bus	Distance				Age					
	Local	Within voivodship >40km	Long distance	Totals	15 -18	19 -29	30 - 45	46 -60	60+	Totals
definitely not	29,6%	15,6%	17,6%	24,7%	20,0%	24,4%	23,4%	23,7%	36,8%	24,7%
rather not	24,1%	18,8%	23,5%	23,0%	20,0%	28,9%	14,9%	34,2%	10,5%	23,0%
sometimes	25,9%	31,3%	29,4%	27,6%	32,0%	17,8%	40,4%	21,1%	26,3%	27,6%
probably yes	14,8%	34,4%	17,6%	19,0%	20,0%	22,2%	14,9%	18,4%	21,1%	19,0%
definitely yes	5,6%	0,0%	11,8%	5,7%	8,0%	6,7%	6,4%	2,6%	5,3%	5,7%

In regard to the opportunities that introduction of electronic ticketing by bus operator could create certain user responses could be summarized:

- Electronic ticketing acceptance is strongly correlated with distance travelled. For majority of short distance travellers this is useless as they prefer either monthly ticket (this are mostly regular travellers) or find it easier to buy directly on-board. Attractiveness of this solution increases with medium distance travellers (close to 70% total positive answers) and is even higher with long distance travellers (80% positive answers). The structure of positive opinions changes with distance as well. Among long distance travellers there is significantly higher share of those finding proposed solution necessary or very useful as compared to majority of valuating it as rather useful among mid-distance customers. The age plays also significant role. Surprisingly the solution scores poorly in lowest age group (15-19) and . not surprisingly . among oldest users. Highest acceptance levels are expressed by 19-45 year olds. It is positive pattern which shows that customers which are most sought after from the marketing point of view - people who have some disposable income (students and employed) are more inclined to use electronic tickets.
- The high acceptance does not directly translates into high willingness to pay. The similar average to the one expressed with other solutions could be noticed. The steady 20% of customers are willing to pay for this ICT.
- Nevertheless there are certain patterns which show higher interest in electronic ticketing than in other discussed ICT solutions. Among those willing to pay there is visibly bigger group of people

accepting payments exceeding 1 PLN with 27% accepting additional costs associated with use of electronic ticketing services up to 2 PLN and further 21% even as much as 5 PLN. The highest acceptance for increased payments could be found among 19-45 year old which confirms that customers who have stable income are more inclined to pay for additional services.

- Possible impact on modal shift could be significant. Although only 5% of the questioned declares desire to change into bus. But as many as 19% declares likely change and further 27% occasional change into bus. Those numbers even if exaggerated clearly show that potential for modal shift is high but most likely the combination of improvements is necessary to precipitate real switch from private car use to bus use.

4.3.4 Real-time Information on Services via Mobile Phone/Internet

The usefulness of real-time phone/internet accessible information about current services is perceived differently by local and long distance passengers.

Table 4-19 Acceptance of real-time information on services via mobile phone/internet among different distance passengers (CS5 survey)

Usefulness	Local	Within voivodship >40km	Long distance	Totals
Useless	32,1%	18,6%	16,7%	26,8%
Little usefulness	24,5%	25,6%	12,5%	22,4%
Rather useful	22,6%	20,9%	31,3%	24,0%
Very useful	17,6%	27,9%	29,2%	21,6%
Necessary	3,1%	7,0%	10,4%	5,2%

Also the different usefulness is reported by users at different age.

Table 4-20 Acceptance of real-time information on services via mobile phone/internet by different age groups (CS5 survey)

Usefulness	15 -18	19 -29	30 - 45	46 -60	60+	Totals
Useless	4,8%	16,1%	19,7%	40,4%	61,8%	26,8%
Little usefulness	26,2%	10,7%	31,1%	22,8%	20,6%	22,4%
Rather useful	40,5%	21,4%	26,2%	22,8%	5,9%	24,0%
Very useful	21,4%	41,1%	18,0%	12,3%	11,8%	21,6%
Necessary	7,1%	10,7%	4,9%	1,8%	0,0%	5,2%
n=	50	67	73	69	41	300

The respondents willingness to pay for this type of real-time easily accessible information has also been tested producing following responses:

Table 4-21 Willingness to pay for real-time information on services via mobile phone/internet (CS5 survey)

Additional payment acceptance	Distance				Age					
	Local	Within voivodship >40km	Long distance	Totals	15 -18	19 -29	30 - 45	46 -60	60+	Totals
yes	16,4%	16,3%	25,0%	18,0%	21,4%	25,0%	19,7%	12,3%	8,8%	18,0%
no	83,6%	83,7%	75,0%	82,0%	78,6%	75,0%	80,3%	87,7%	91,2%	82,0%

The other aspect of willingness to pay is the question of how much the likely users are ready to pay for the offered service. Here like with all tested ICTs the predominant range is symbolic payment of less than 1 PLN.

Table 4-22 Price elasticity - real-time information on services via mobile phone/internet (CS5 survey)

Additional cost	Distance				Age					
	Local	Within voivodship >40km	Long distance	Totals	15 -18	19 -29	30 - 45	46 -60	60+	Totals
1 PLN	73,1%	42,9%	50,0%	62,2%	55,6%	57,1%	66,7%	57,1%	100,0%	62,2%
2 PLN	26,9%	42,9%	41,7%	33,3%	44,4%	28,6%	33,3%	42,9%	0,0%	33,3%
5 PLN	0,0%	14,3%	8,3%	4,4%	0,0%	14,3%	0,0%	0,0%	0,0%	4,4%

The potential for modal shift due to the introduction of this solution is rather limited.

Table 4-23 Expected modal shift after introduction of real-time information on services via mobile phone/internet (CS5 survey)

Shift to bus	Distance				Age					
	Local	Within voivodship >40km	Long distance	Totals	15 -18	19 -29	30 - 45	46 -60	60+	Totals
definitely not	25,0%	6,3%	20,6%	20,7%	12,0%	15,6%	21,3%	23,7%	36,8%	20,7%
rather not	36,1%	40,6%	29,4%	35,6%	16,0%	42,2%	29,8%	47,4%	36,8%	35,6%
sometimes	25,0%	40,6%	38,2%	30,5%	40,0%	33,3%	34,0%	21,1%	21,1%	30,5%
probably yes	13,0%	9,4%	8,8%	11,5%	28,0%	6,7%	12,8%	7,9%	5,3%	11,5%
definitely yes	,9%	3,1%	2,9%	1,7%	4,0%	2,2%	2,1%	0,0%	0,0%	1,7%

While considering the impacts of real-time information in regard to bus position and service parameters available through mobile phone application or via internet certain behavioural patterns have to be considered:

- Real-time information services provided via smartphones and/or Internet are considered useful or very useful by 45% of users. 5% find them necessary while the rest is not convinced. This gives almost 50-50 split among those accepting and reluctant towards new solution. This pattern is different in long and short distance traveller groups. For short trips reluctance is higher than for longer routes.
- Age has some impact on preferences. Younger users generally accept this solution ((40% - rather useful ranking and 28% . very or extremely useful answers) among 15-18 year old. There is sharp increase in positive attitudes in 19-45 age group (Same figures are: for 19-35 age group . 21% and 50% correspondingly and for age group 30-45 years relevant figures are: 26% and 23%). The older travellers (46-60 year group are more reluctant . 40% finds it useless and 22% of little use and among those aged 60 and more figures are even more dramatic . 62% opposing the solution and 20% finding it of little use).
- Willingness to pay remains low at all age groups but most inclined to pay are people between 19 and 29 years with 25% willing to pay while least inclined those aged 60+ (only 9% expressing will to pay) Average for the whole user population is at 18%.
- There is very few willing to pay more than 5PLN (4.4%) . and none of those in short distance travel. With about 33% willing to pay up to 2 PLN and the rest no more than 1 PLN.
- The possibility for modal shift is limited with only 1.7% definitely in favour of changing modes and further 11.5% declaring probable change. There is also a group of about 30% users who declare occasional change to bus.

4.3.5 Real-Time Information on Services on Board of Vehicles

The usefulness of real-time information about actual position of vehicle, expected arrival times, possible connections etc. available on board of the vehicle scores differently among different distance travellers.

Table 4-24 Acceptance of real-time information on services on-board of vehicles among different distance passengers (CS5 survey)

Usefulness	Local	Within voivodship >40km	Long distance	Totals
Useless	21,4%	4,7%	10,4%	16,4%
Little usefulness	7,5%	11,6%	2,1%	7,2%
Rather useful	32,1%	20,9%	27,1%	29,2%
Very useful	34,0%	39,5%	45,8%	37,2%
Necessary	5,0%	23,3%	14,6%	10,0%

The differences could also be noted in regard to age of the user.

Table 4-25 Acceptance of real-time information on services on-board of vehicles by different age groups (CS5 survey)

	15 -18	19 -29	30 - 45	46 -60	60+	Totals
Useless	7,1%	5,4%	13,1%	19,3%	47,1%	16,4%
Little usefulness	9,5%	5,4%	3,3%	14,0%	2,9%	7,2%
Rather useful	35,7%	25,0%	34,4%	26,3%	23,5%	29,2%
Very useful	38,1%	41,1%	42,6%	35,1%	23,5%	37,2%
Necessary	9,5%	23,2%	6,6%	5,3%	2,9%	10,0%
n=	50	67	73	69	41	300

The willingness to pay is rather low as majority of users believe that this type of service should be provided by operator by default. This view is reinforced by experience from other service providers as more and more city transport companies introduce some form of electronic on-board information systems without increasing price of tickets. Therefore acceptance among different users is as follows:

Table 4-26 Willingness to pay for real-time information on services on board of vehicles (CS5 survey)

Additional payment acceptance	Distance				Age					
	Local	Within voivodship >40km	Long distance	Totals	15 -18	19 -29	30 - 45	46 -60	60+	Totals
yes	20,8%	44,2%	31,3%	26,8%	28,6%	35,7%	31,1%	19,3%	14,7%	26,8%
no	79,2%	55,8%	68,8%	73,2%	71,4%	64,3%	68,9%	80,7%	85,3%	73,2%

The elasticity towards price change could be checked by analysing results of declared additional amount to pay for the on-board information services.

Table 4-27 Price elasticity - real-time information on services on board of vehicles (CS5 survey)

Additional cost	Distance				Age					
	Local	Within voivodship >40km	Long distance	Totals	15 -18	19 -29	30 - 45	46 -60	60+	Totals
1 PLN	72,7%	78,9%	46,7%	68,7%	58,3%	65,0%	63,2%	81,8%	100,0%	68,7%
2 PLN	21,2%	21,1%	40,0%	25,4%	25,0%	30,0%	36,8%	9,1%	0,0%	25,4%
5 PLN	6,1%	0,0%	13,3%	6,0%	16,7%	5,0%	0,0%	9,1%	0,0%	6,0%

The potential modal shift could be achieved if on-board information service is introduced in limited way.

Table 4-28 Expected modal shift after introduction of real-time information on services on board of vehicles (CS5 survey)

Shift to bus	Distance				Age					
	Local	Within voivodship >40km	Long distance	Totals	15 -18	19 -29	30 - 45	46 -60	60+	Totals
definitely not	24,1%	12,5%	20,6%	21,3%	12,0%	17,8%	21,3%	23,7%	36,8%	21,3%
rather not	27,8%	21,9%	23,5%	25,9%	16,0%	22,2%	23,4%	36,8%	31,6%	25,9%
sometimes	25,0%	37,5%	29,4%	28,2%	32,0%	33,3%	31,9%	21,1%	15,8%	28,2%
probably yes	22,2%	21,9%	23,5%	22,4%	36,0%	24,4%	23,4%	13,2%	15,8%	22,4%
definitely yes	,9%	6,3%	2,9%	2,3%	4,0%	2,2%	0,0%	5,3%	0,0%	2,3%

While introducing real-time on-board information services into the buses operating in rural areas the following considerations must be taken into account:

- Real-time on-board information is easily accepted by huge majority of all users(76%). The highest acceptance is among long distance passengers with 46% considering this very useful and 14.6% necessary improvement. Non-acceptance level within this group is at 10.4%. Mid-distance travellers also express high acceptance (23.3% find it necessary and 39.5% very useful with only 4.7% declining to use this service and 11.6% reluctant).
- Within different age groups the best scores are noted among 19-29 and 30-45 year olds who accept this solution fully in 23.2% and 6.6% respectively or accept it very well in 41.15 and 42.6% correspondingly. The high acceptance is also present within youngest group (15-18 year olds) with 9.55 finding on-board information necessary and 38.1% very useful. The opposition against this solution could be found mostly in the 60+ group (47,1% rejecting solution) and 46-60 year olds with 19.3% rejecting solution and 14% expressing little interest.
- There is slightly lower resistance against payment for on-board information services among users as compared to other considered ICT solutions. Nevertheless still solid 73.25 does not accept additional costs associated with introduction of this solution. Among those accepting it the highest acceptance could be found in long-distance traveller group. This is somewhat surprising as it is rather short distance traveller who needs exact information on delays due to many more possible switches to other bus/mode of transport. However this could be explained by need of long distance traveller to be on . time due to the fact that long-distance services are less frequent than sort distance. As such they require more planning. In case bus is late possible additional opportunities and options to continue trip need to be better researched while short distance traveller is more likely to find replacement connection anyway.
- Among those willing to pay majority (68%) accepts payments not exceeding 1 PLN with slightly more than 25% accepting up to 2 PLN and little more than 6% of payments up to 5 PLN. There is somewhat higher acceptance for 2 PLN range than in other considered solutions this mainly due to high acceptance of the solution among long distance passengers who seem to be main beneficiaries.
- Only 2.3% of users declare that they will totally abandon cars in case this solution is developed. Further 22.4% declares this move probable and 18.25 offers that they change to bus on some trips.

4.3.6 Demand Responsive Services

The usefulness of demand responsive bus routing is not considered as highly attractive solution by majority of users scoring well below average of other solutions researched:

Table 4-29 Acceptance of possibility for direct pick-up/delivery of passengers in response to prior demand among different distance passengers (CS5 survey)

Usefulness	Local	Within voivodship >40km	Long distance	Totals
Useless	32,7%	25,6%	31,3%	31,2%
Little usefulness	30,2%	25,6%	35,4%	30,4%
Rather useful	27,7%	32,6%	18,8%	26,8%
Very useful	8,2%	16,3%	12,5%	10,4%
Necessary	1,3%	0,0%	2,1%	1,2%

There are not significant age effects on this solution . it is almost uniformly rejected by users regardless of age with only slightly better reception within younger passengers.

Table 4-30 Acceptance of possibility for direct pick-up/delivery of passengers in response to prior demand by different age groups (CS5 survey)

Usefulness	15 -18	19 -29	30 - 45	46 -60	60+	Totals
Useless	26,2%	16,1%	24,6%	36,8%	64,7%	31,2%
Little usefulness	26,2%	32,1%	37,7%	40,4%	2,9%	30,4%
Rather useful	28,6%	41,1%	24,6%	14,0%	26,5%	26,8%
Very useful	16,7%	7,1%	13,1%	8,8%	5,9%	10,4%
Necessary	2,4%	3,6%	0,0%	0,0%	0,0%	1,2%
n=	50	67	73	69	41	300

Non-acceptance results in limited willingness to pay for the service.

Table 4-31 Willingness to pay for possibility for direct pick-up/delivery of passengers in response to prior demand (CS5 survey)

Additional payment acceptance	Distance				Age					
	Local	Within voivodship >40km	Long distance	Totals	15 -18	19 -29	30 - 45	46 -60	60+	Totals
yes	22,0%	25,6%	14,6%	21,2%	26,2%	28,6%	18,0%	15,8%	17,6%	21,2%
no	78,0%	74,4%	85,4%	78,8%	73,8%	71,4%	82,0%	84,2%	82,4%	78,8%

Yet closer look at the amounts that are declared shows that those uses who understand that this service would be very similar to the taxi services are slightly more inclined to increase offered amounts as compared to other considered ITC solutions.

Table 4-32 Price elasticity - possibility for direct pick-up/delivery of passengers in response to prior demand (CS5 survey)

Additional cost	Local	Within voivodship >40km	Long distance	Totals	15 -18	19 -29	30 - 45	46 -60	60+	Totals
1 PLN	60,0%	27,3%	28,6%	49,1%	54,5%	31,3%	54,5%	44,4%	83,3%	49,1%
2 PLN	22,9%	9,1%	14,3%	18,9%	18,2%	25,0%	9,1%	22,2%	16,7%	18,9%
5 PLN	11,4%	45,5%	28,6%	20,8%	18,2%	25,0%	27,3%	22,2%	0,0%	20,8%
7 PLN	2,9%	18,2%	14,3%	7,5%	9,1%	18,8%	0,0%	0,0%	0,0%	7,5%
20 PLN	0,0%	0,0%	14,3%	1,9%	0,0%	0,0%	9,1%	0,0%	0,0%	1,9%
More than 10 PLN	2,9%	0,0%	0,0%	1,9%	0,0%	0,0%	0,0%	11,1%	0,0%	1,9%

The possible impact on modal shift could be best described by user responses to the proposal of replacing private cars by bus services in their trips.

Table 4-33 Expected modal shift after introduction of possibility for direct pick-up/delivery of passengers in response to prior demand (CS5 survey)

Shift to bus	Distance				Age					
	Local	Within voivodship >40km	Long distance	Totals	15 -18	19 -29	30 - 45	46 -60	60+	Totals
definitely not	27,8%	9,4%	29,4%	24,7%	20,0%	26,7%	23,4%	21,1%	36,8%	24,7%
rather not	31,5%	31,3%	29,4%	31,0%	32,0%	35,6%	29,8%	36,8%	10,5%	31,0%
sometimes	31,5%	43,8%	32,4%	33,9%	36,0%	26,7%	36,2%	34,2%	42,1%	33,9%
probably yes	8,3%	9,4%	5,9%	8,0%	12,0%	8,9%	6,4%	5,3%	10,5%	8,0%
definitely yes	,9%	6,3%	2,9%	2,3%	0,0%	2,2%	4,3%	2,6%	0,0%	2,3%

Introduction of demand responsive bus service faces many barriers. While trying to attract users to this solution following has to be considered:

- In general users are not interested in demand responsive bus services with as many as 31.2% negating this solution completely and 30.4% being not interested. There are only 1.2% of enthusiasts towards this measure. The rejection of this service is almost equal among all distance groups (63% negative answers in local travellers group, 51% in medium distance travellers and 61% in long distance). What matters more there are few full supporters, majority of those accepting does it with reluctance. This is surprising especially within local distance group as this group should benefit most from buses acting almost like taxis. This result could be only explained by lack of belief that this will work and fears that just in time direct delivery is not really plausible given number of passengers that should be serviced during one bus course. Delays and impossibility to practically attain perceived elasticity are expected.
- The opposition among different age groups shows that there are no users finding this solution necessary among people older than 30 years! In addition as many as 65% 60+ finds it useless as well as 37% of 46-60 year olds. Altogether rejection or little usefulness are attributed to the solution by respectively 52.4% 15-18 year olds, 48,2% 19-29 year olds and 62.3% of 20-45 year olds.
- Lack of interest influences lack of willingness to pay. This solution is characterised by lowest level of this factor. Only 78.2% of users express positive view on payment prospect.
- Among those willing to pay there is however better understanding that this type of improvement to transport service has to cost additional money. The willingness to pay is still low with as many as 49% accepting payments not exceeding 1 PLN yet there is a significant group which understands that bus service conducted more in a taxi like fashion requires higher prices (19% willing to pay up to 2 PLN and 18% up to % PLN. There are even users accepting as much as 10 PLN increase in price (7.5%) and 1.2% being ready to incur even higher cost.
- Probably most disappointing result from the consultation is that the solution which is as close to the comfort offered by private car as possible does not induce significant effect in terms of modal shift. Only 2.3% of respondents declare the change to bus with slightly more than 8% high probability of such a move. Close to 34% of those declaring occasional change from private car to bus has to be considered as too few to justify the effort related to the provision of bus on demand service.

5 SURVEY 2 FOR CASE STUDY 5 – FUTURE INTERURBAN PUBLIC TRANSPORT IN WARMINSKO-MAZURSKIE VOIVODSHIP

5.1 EXECUTIVE SUMMARY OF THE SURVEY

The aims of in-depth focus surveys conducted were to:

- Gather general opinions on public transport advantages/disadvantages vs. individual transport in the area in order to determine possibility for modal shift and realistic acceptance levels for improvements in public transport.
- Evaluate the proposed ICT solutions.
- Identify barriers preventing their introduction.
- Test demand elasticity for solutions in regard to price change.
- Learn about most sought after/expected future improvements to the public transport.

The table below depicts the most important advantages and disadvantages of analysed solutions as expressed by users and operator employees.

Table 5-1 Summary of main effects of proposed ICT solutions

	Solution	Highest scoring advantage	Most important disadvantage
1	<i>Electronic real-time information at bus stops</i>	Passenger could use spare time for other activities	Electronic info-boards are subject to vandalism
2	<i>Real-time information on board of vehicles</i>	Exact information on arrival/connections	Potential need for input from the driver
3	<i>Internet based travel planners.</i>	Optimal travel planning	Often not up to date information
4	<i>V2V communication (as a component of above real-time ICT systems)</i>	Exact information for passenger and operator	Full control over drivers by dispatcher / operations centre
5	<i>Ticket purchasing via mobile phones / internet</i>	Guaranteed seat in bus	Lack of confidence in system
6	<i>Real-time information on services via mobile phones / internet</i>	Exact information on arrivals/departures	Difficult to use
7	<i>Demand responsive services</i>	Access to cheap (?) transport outsider the regular schedule	High cost either for passenger or operator

5.2 SURVEY CHARACTERISTICS

5.2.1 Survey Methodology

This study has been conducted based on the focus group method. Three focus groups have been selected Two composed of users and potential users and third one of representatives (drivers) of the public service provider . bus company operating from Szczytno. Groups were moderated. The focus group method was based on interviews with respondents on the preselected topics which was the user

(or in case of third focus group the provider) response to the introduction of certain ICT solutions into the bus based public transport in the region. The method allows for in-depth analysis of user / provider reactions their motives, hidden objections, factors supporting and preventing easy introduction of ICTs into the transport system. The interviews took place on 14 and 15 December 2012 in Szczytno.

5.2.2 Geographical Area Covered by the Survey Research

The area of the survey is Szczytno region in the warminsko-mazurskie voivodship North-Eastern part of Poland. This is low GDP rural area. It has about 25,000 inhabitants, while in the close vicinity of Szczytno area (powiat) lives about 70,000 people for whom Szczytno is centre of gravity. The survey area is the same as the attempted case study area.



Figure 5-1 Szczytno region in the North-Eastern part of Poland.

Source: maps.google.pl

The transport network at the area is rather underdeveloped. There road network constitutes the three national roads:

- No 53 (Olsztyn-Ostroja).
- No 57 (Bartoszyce-Pułtusk).
- No 58 (Olsztyn-Szczuczyn).

There is also one voivodship level road - no 600 (Szczytno-Mragowo) and few local roads. There is a railway connection from Szczytno to Olsztyn and Ełk (line no 219). Two local lines (no 35 to Ostroja and no. 262 to Biskupiec) have been disconnected from the network by PKP. However there is an international airport in the area . Szczytno-Szymany which is 7km from Szczytno. However this airport is for occasional rather than regular flights.

5.2.3 Respondents

The focus study has been conducted in three groups. Group one . 8 users/potential users of public transport aged 20-30. Group two . 6 users /potential users of public transport aged 50-65. Group three - 5 drivers, employees of the public transport provider.

5.2.4 Solutions Considered

ICT solutions surveyed in this case are:

1. Internet based travel planners.
2. Electronic real-time information at bus stops.
3. Ticket purchasing via mobile phones / internet.
4. Real-time information on services via mobile phones / internet.
5. Real-time information on estimated arrival times, stops, route on board of vehicles.
6. Demand responsive services - possibility for direct pick-up/delivery of passengers in response to prior demand.

5.3 RESULTS

Depending on specific solution different favourable and unfavourable conditions for solution implementation as well as expected results are addressed by focus groups.

5.3.1 Internet or Mobile Phone Based Travel Planners

Advantages of the internet and/or mobile phone based travel planners:

- Quick access to the information.
- Good spectrum of information.
- Possibility to optimise travel plan.
- Passengers also welcome additional information, e.g. about road works etc.
- Additional information are welcome (like type of bus, its quality etc).
- Reduced burden on the operator part (less frequent call to operation centre by passengers).

Disadvantages/barriers preventing widespread use of internet/mobile phone based travel planners:

- Not always reliable information.
- Necessary access to the Internet and skills (problem for older users).
- On the service provider part . need to service on-line services.

5.3.2 Electronic Real-Time Information at Bus Stops

Advantages of the electronic real-time information available at bus stops:

- Traditional are more exposed to weather . they disappear due to rain wind etc.
- Visible from distance.
- Shows real arrival / departure passenger could resign or use additional time for other activity if coach is delayed.
- Reduces uncertainty (whether bus has already left or not?).
- Drivers points that this could also give additional information in order to reduce people anger over delays (e.g. technical reasons etc.).
- Accordingly to passengers it should also inform about current seats availability in coach.

Disadvantages/barriers in provision of the electronic real-time information available at bus stops:

- Electronic equipment will be likely devastated or destroyed except for main stations.
- Transport operator company employees point out that electronic boards are likely to be very expensive.

5.3.3 Ticket Purchasing via Mobile Phone/Internet

Advantages of ticket purchasing via mobile phone/internet:

- Ticket is available 24h/day this eliminates problem of ticket sales for routes operated outside the ticket booth opening hours
- Tickets could be more easily purchased by passengers using stops on which there is no ticket booth.
- Drivers are not burdened with ticket sales which reduces stop time for boarding and eliminates need to provide drivers with change money.
- Ticket purchased via electronic means guarantees place in bus while purchase on the way is only possible if there are still free places in the bus
- From the operator point of view this measure improves knowledge as to the demand and allows for allocation of appropriate size bus to the particular route.

Disadvantages of ticket purchasing via mobile phone/internet:

- Passengers must have access to the Internet and need to know how to operate it. For older passengers this is significant barrier as they are not familiar with this technology in everyday life.
- Some passengers are reluctant to purchase tickets via electronic means due to the fear of fraud
- Some passengers are reluctant to purchase tickets via electronic means due to lack of confidence in validity of electronic ticket as opposed to material+printed ticket. Others are not confident that driver will accept electronic ticket presented for instance on mobile phone.
- If the mobile phone fails or switches off due to low battery than passenger cannot proof ticket purchase.
- On some remote rural areas there might be slow transfer of data or interruptions might occur . in this case passenger might have paid for the ticket but might be unable to receive confirmation to the mobile phone.
- There is significantly more burden on the passenger with electronic ticket (for instance with self-printing or downloading and checking correctness as opposed to transport operator issued paper ticket)
- Some passengers do not have printer available at home to print ticket.
- From the operator side there might be problems with money transfers (delays in money transfer while purchase confirmation and ticket issuance is immediate . than operator does not have guarantee that money transfer will finally occur). Reserving all seats through internet means that there might be more refusals to the clients boarding bus in traditional way on more remote destinations.
- This service is most popular in regard to younger users which could often use reduced fare (e.g. students). It was often the case that whole bus was reserved by those low fare passengers resulting in reduced operator income.

5.3.4 Real-time Information on Services via Mobile Phone/Internet

Advantages of real-time information on services provided via mobile phone/internet:

- Information is always available, even if passenger is far from bus stop/station. Passenger could plan ahead.
- Passenger knows exact arrival time on particular stop. If bus is delayed could use the spare time for small activities.
- This also eliminates the fear that the bus has been cancelled or was early.
- Passengers could also welcome additional services like SMS information about cancellations etc.

Disadvantages of real-time information on services provided via mobile phone/internet:

- Use of mobile phone and especially internet based applications in mobile phone is difficult for people with impaired eyes conditions.
- Like other mobile/phone internet based services it demands certain level of familiarity with technology . which is not common among older passengers.
- Access to the internet services via mobile phone could be too expensive (this applies to users who use basic phone plan without data transfer included in monthly payments).
- Internet in mobile phone could be slow working.

- There is strong reluctance to provide operator with personal phone number (needed for services like SMS information about delays/cancelations).

5.3.5 Real-Time Information on Services on Board of Vehicles

Advantages of the real-time on-board information:

- Passenger will not miss his/her stop.
- Passengers suggest that it should be accompanied by voice announcements.
- Very useful in situation when current trip is just one leg of longer journey . information on estimated arrival reduces stress resulting from fear of not catching next bus, allows for better planning of journey.
- Might give information on longer routes about length of breaks in journey (allowing passengers for instance to shop for food/newspapers).
- Delays will be directly visible to the company management allowing for optimisation of daily fleet management and reducing driver stress resulting from need to explain reasons of delay to the superiors.
- Reduces frequent behaviour of passenger asking driver about estimated arrival times which is distressing to the drivers.
- Reduces passenger complaints as to the not stopping at particular bus stop . certain bus stops are omitted on some routes but passengers do not know about it and blame drivers.

Disadvantages/barriers in provision of real-time on-board information:

- Need to program electronic information system especially need to update it while driving.
- Not very useful on short routes.

If V2V is to be used for this purpose than following advantages are reported by focus group members:

- It is additional source of information supporting traditional communication . In many instances this replaces the manner of passengers to ask questions about connections directly to drivers.
- From the operator point of view this allows for drivers to take on board passengers from other buses . for instance in case of breakdowns.
- It allows for fleet management and for optimisation of operations . for instance if one bus is delayed the connecting bus could be delayed to allow passengers from the former continuation of multi-leg journey.
- There is an instant knowledge about breakdowns or big numbers of passengers at certain stops allowing the operator to respond by sending additional buses on given route
- The system greatly improves work of dispatcher

If V2V is to be used for this purpose than following disadvantages are reported by focus group members:

- Real-time GPS based information could be stressful to drivers (knowing that they are not meeting schedule) and might entice them to irresponsible behaviours (e.g. speeding).
- It could also create pressure on driver from the passengers who if bus is delayed might fear that they will not make connecting route and
- On some routes the drivers of competitive companies sometimes cooperate informally (for instance if one of them is late and other could pick up passengers from particular stop). They do not necessary want for the company to know about such ~~gentleman agreements~~ ~~gentleman agreements~~.

5.3.6 Demand Responsive Services

Advantages of demand responsive service . ordered buses:

- Fill the gap during service break (e.g. night). In rural areas scheduled bus service is not operational at nights (for instance in Szczytno area subjected to this research) bus operations case after 7 p.m. nor do they operate on Sundays.
- Convenience
- Depending on the price but it is perceived as very good solution as dedicated service for employees of bigger companies for daily commuter travel.

- This is also perceived as good replacement of taxi services especially to/from the nearby airport (Szczotyń-Szymany Airport)

Disadvantages/barriers preventing introduction of user responsive service . buses on demand:

- Price is believed to be too high to be really competitive against taxi services. Passengers expectations are that price for dedicate bus service will be much higher than regular fare.
- Problem with elastic route and changing arrival times . in order to make service cost efficient bus route might be very complicated and if servicing many users the travel time might lengthen beyond acceptable frame.
- Legal barrier . operator points out that from the legal point of view demand responsive bus service could be classified as rental of a bus . in this case special concession is necessary and each trip needs to be pre-accepted by authorities (due to the road transport inspection demand to check technical condition of the vehicle).

5.3.7 Consultation with the Stakeholder – Public Transport Provider

Consultation with the stakeholder . public transport bus company has been conducted in order to determine severity of technical and organisational barriers to the introduction of ITC solutions. Bus operators in rural areas often use less technically advanced equipment. This is not really a preventive barrier for installation of improvements like electronic on-board displays with real-time information or GPS service. Nevertheless it might be strange for some passengers that this older fleet is equipped with this level of technology while there are no rudimentary improvements (as perceived by passengers) like clean and comfortable seating or even more advanced but still being first on the passengers wish list like air-conditioning.

There is also significant cost barrier operators point out that cost of electronic displays is rather high and cost of purchase and maintenance of data transmission system will be even higher.

6 SURVEY FOR CASE STUDY 7 - BIKE-SHARING IN VIENNA AND THE SURROUNDING REGION

6.1 EXECUTIVE SUMMARY OF THE SURVEY

TUW carried out a computer-aided telephone survey in April and May 2013 to capture the user responses to bike-sharing schemes operating in and around Vienna. The survey was carried out in Vienna and Lower Austria. The survey in Lower Austria is designed so that the data can be compared to a survey in 2009, while the survey in Vienna is the first of its kind.

In Vienna, the survey revealed that more than 90% of the people at least know about the bike-sharing schemes, which has been served for Vienna for 10 years. Among the Viennese respondents, 28% of the people have used it. The most typical reason for not using shared bike is the ownership of the own bicycle.

In Lower Austria, the survey revealed that there is a general tendency that bicycle is more used while awareness of the shared bike of its own is low. Meanwhile, awareness of the Viennese bike-sharing scheme became higher over the four year period in Lower Austria.

In both federal states, people tend to know about the bike-sharing on street. either at the stations or by seeing shared bike in use. This strongly implies that visibility of the bike-sharing schemes on the street is an important factor to make the people aware of it and it may take some long time with a number of stations and bicycles until certain proportion of the people know the system.

Regarding ICT-relevant aspects asked in the survey, roughly two-thirds of the respondents are familiar with ICT-based user interface in general. Bike-sharing being focused, about half of the respondents, especially those in Lower Austria, still want to pay in cash, while booking/identification system employing card or phone-based system appears to be accepted widely. The development with ICTs including reporting broken bikes via app, short-term reservation as well as information about bicycle condition over the smartphone app are evaluated as useful development, while identification methods other than phone-based or card-based one tend to be evaluated less useful.

6.2 SURVEY CHARACTERISTICS

6.2.1 Survey Methodology

The survey was carried out as a CATI (computer-aided telephone interview) by a professional telephone survey institution headquartered in Vienna. The survey was carried out in April and May 2013. The survey was carried out from the institution's CATI-studio in Vienna and it was not outsourced to another country. The questionnaire was prepared by TUW in line with the 2009 survey¹ so that comparability is guaranteed, while wording and order was slightly amended by an expert at the survey institution.

6.2.2 Geographical Area Covered by the Survey Research

The survey was carried out to the individuals in two federal states (Länder) in the eastern part of Austria, namely Lower Austria and Vienna. In Lower Austria, the survey was carried out in 20 municipalities as shown in the following table. These 20 municipalities are as same as the survey in 2009 and chosen to cover various types of municipalities such as rural, regional centre or suburb, and to represent the population in the state.

The sampling was made through random address choice from the public telephone directory for the selected municipalities. The number of the chosen address is proportionally same as the number of the inhabitants in the surveyed region. After random choice, selection is made based on gender, age and municipality.

¹ Pfaffenbichler P, Pickl N (2009). Befragung Freiradl, NÖ - Organisation und Auswertung Befragung Freiradl, NÖ. AEA, Wien.

Table 6-1 List of the municipalities surveyed and their population

Federal State	Size Group	City / Town	Characteristics	Inhabitants
Lower Austria	<2,500	Allentsteig	Rural	2,163
		Bad Schönau	Rural	725
		Großmugl	Rural	1,519
		Hennersdorf	Suburb	1,418
		Lengenfeld	Rural	1,373
		Rabenstein	Rural	2,412
		Wallsee	Rural	2,049
	2,500-4,999	Kirchschlag in der Buckligen Welt	Rural	2,960
		Mannersdorf am Leithagebirge	Rural	3,731
		Neuhofen a. d. Ybbs	Rural	2,534
		Raabs an der Thaya	Rural	3,114
		Wieselburg	Rural	3,489
	5,000-9,999	Breitenfurt	Rural	5,323
		Horn	Regional Centre	6,411
		Laa a. d. Thaya	Regional Centre	6,137
		Melk	Regional Centre	5,222
		Wolkersdorf	Regional Centre	6,191
	10,000-19,999	Stockerath	Regional Centre	14,452
		Waidhofen a. d. Ybbs	Regional Centre	11,662
	>20,000	Mödling	Suburb	20,405
Lower Austria Total (including all municipalities)				1,545,804
Vienna		Wien	Urban	1,550,123

Source: STATISTIK Austria (2003)², STATISTIK Austria (2002)³

Thus the survey covers various geographic areas from rural to urban. The data from Lower Austria can be interpreted rather from rural area and regional centre while the data from Vienna can be interpreted from urban residents. In the entire report, the results from Lower Austria and Vienna are separately presented, with Vienna data shown in green in the figures and Lower Austria data shown with blue in the figures.

6.2.3 Respondents

The CATI was made to the individuals between 15 and over 75 year-old who live in Vienna or in selected municipalities in Lower Austria where bike-sharing schemes are in operation. The total number of respondents are 500 . 248 among them are from Lower Austria and 252 among them are from Vienna. This proportion well represents the actual population in the two federal states. The breakdown of the number of respondents by municipality is shown in the following table.

² STATISTIK Austria (2003). VOLKSZÄHLUNG Hauptergebnisse I . Niederösterreich.

³ STATISTIK Austria (2002). VOLKSZÄHLUNG Hauptergebnisse I . Österreich.

Table 6-2 Number of respondents in each municipality

Federal State	Size Group	City / Town	Respondents
Lower Austria	<2,500	Allentsteig	6
		Bad Schönau	3
		Großmugl	6
		Henndorf	1
		Lengenfeld	4
		Rabenstein	3
		Wallsee	4
	2,500-4,999	Kirchschlag in der Buckligen Welt	6
		Mannersdorf am Leithagebirge	8
		Neuhofen a.d. Ybbs	7
		Raabs an der Thaya	11
		Wieselburg	6
	5,000-9,999	Breitenfurt	10
		Horn	16
		Laa a. d. Thaya	16
		Melk	16
		Wolkersdorf	12
	10,000-19,999	Stockerau	38
		Waidhofen a. d. Ybbs	26
	>20,000	Mödling	49
Subtotal - Lower Austria			248
Vienna	Wien (Vienna)		252
Grand Total			500

The gender and age distribution is as shown below in the figures. The data for Vienna includes the data from the official statistics, and the data for Lower Austria includes the data from the survey in 2009 carried out by TUW as well as the data from the official statistics. The 2009 survey was carried out as a part of the OBIS (Optimising Bike-sharing in European Cities)⁴.

Gender is well represented in the both federal states as shown by the comparison with the nationwide census in 2001 (STATISTIK Austria, 2003).

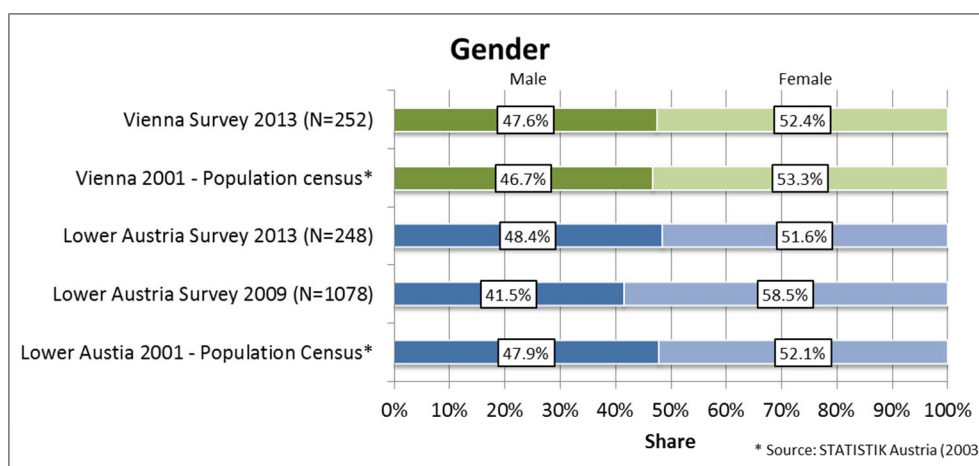


Figure 6-1 Gender of the respondents and in the study area (CS7 survey)

The age in some classes, especially the class between 25 and 40 year-old, is underrepresented while the age in other classes such as 40-60 and 60-75 is overrepresented. According to the survey institution, such underrepresented younger generation and overrepresented older generation is typical

⁴ http://www.obisproject.com/palio/html.run?_Instance=obis

among the CATI; however, as the difference is within 10%, the result still represents well the population.

As mentioned in advance, the 2013 survey was made only for those over 15 year-old due to the current Austrian regulation for the telephone survey, while the 2009 survey was made for those over 10 year-old. As the purpose is to confirm the representativeness, the data from the census for the comparison is derived for those who are over 10 (STATISTIK Austria, 2003).

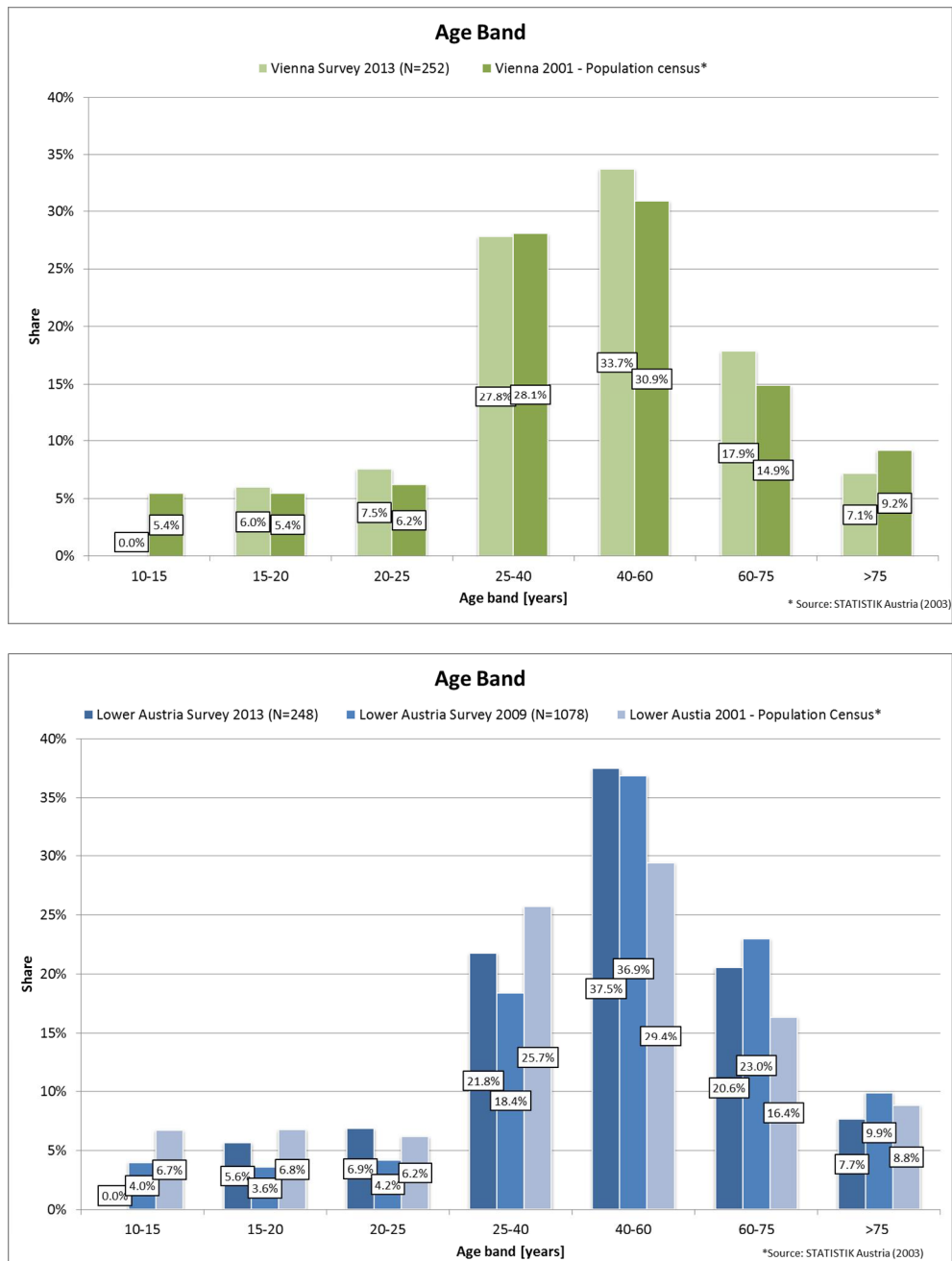


Figure 6-2 Age distribution of the respondents (CS7 survey)

Educational backgrounds were asked in the survey. For comparison, the data from Austrian Statistics Office⁵ is also presented. The Austrian Statistics Office's data covers population between 25 and 64 year-old and thus it is not exactly comparable to the survey which was made for those older than 15; however, this is the best available statistics that is comparable to the samples of the survey.

⁵ STATISTIK Austria (2013). Bildung in Zahlen 2011/12, Page 89.

The comparison for Vienna shows that the people with higher education such as those with university or college degrees are overrepresented and the people only with primary or up to secondary education are underrepresented. The similar tendency is found in the Lower Austrian survey. According to the telephone survey institution, such tendency that highly educated people are overrepresented is fairly common among any telephone survey and the result appears to be in the ordinary range of the difference.

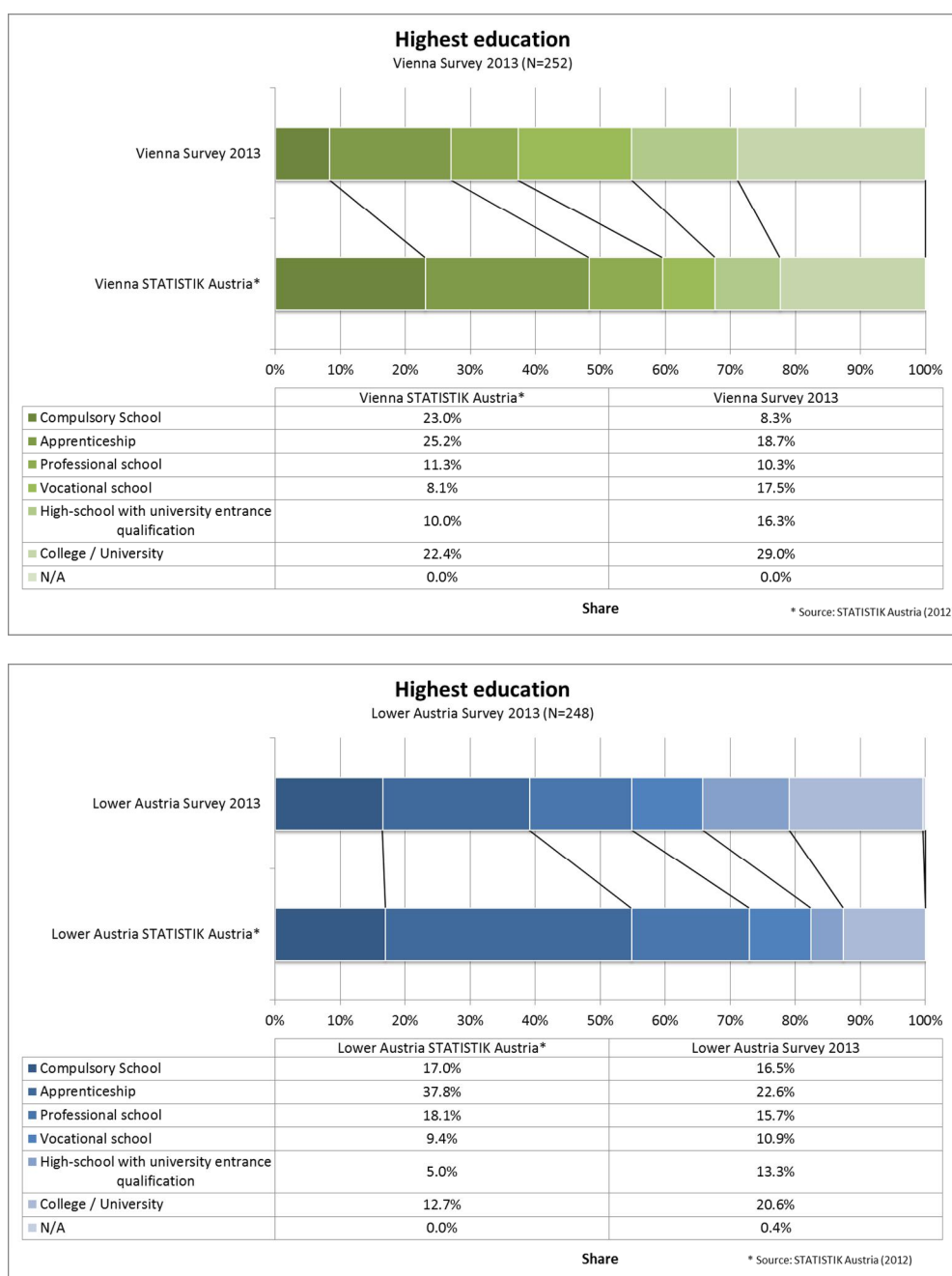


Figure 6-3 Highest education of the respondents and residents in the study area

Source: STATISTIK Austria (2013). Bildung in Zahlen 2011/12, Page 89 and CS7survey

Household size was asked in the survey. Many respondents are in the 1-person or 2-people household.

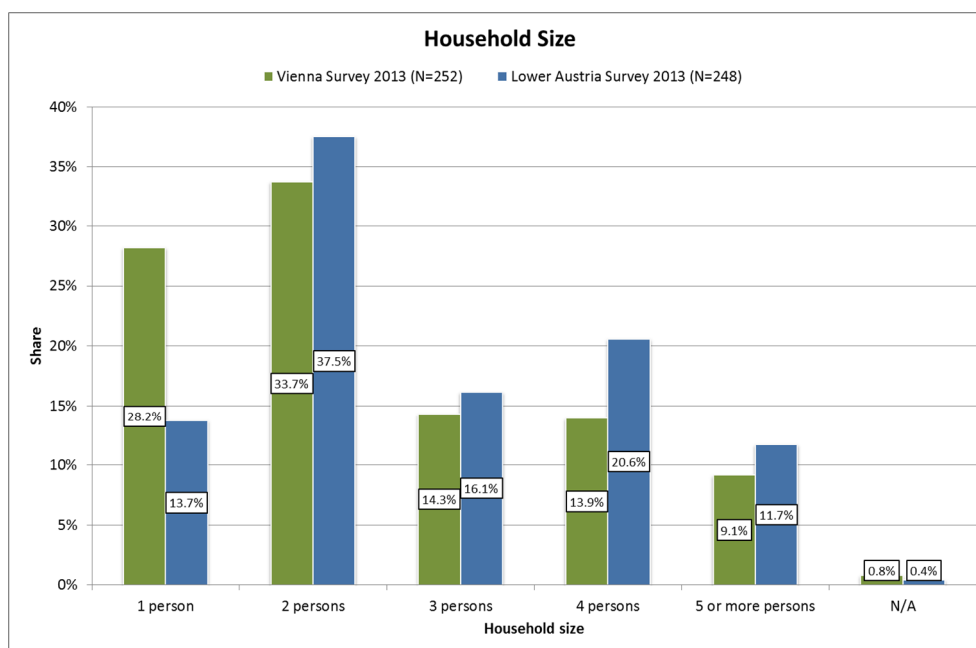


Figure 6-4 Household size in the study area (CS7 survey)

6.2.4 Solutions Considered

The solution considered in this survey is *Shared Bike Scheme Management System*.

6.3 RESULTS

6.3.1 Introduction

In this section, the survey results are presented first with bicycle ownership and usage in general, then awareness and usage experience of bike-sharing schemes, user response to the bike-sharing scheme in general, and user response to identification, authorisation, and payment method. The results are presented subdivided into Vienna and Lower Austria in order that the data of Lower Austrian respondents can be compared to the 2009 OBIS survey and thus the trend can be identified.

6.3.2 Bicycle Ownership and Usage in General

In the survey, to learn the background of the respondents, several basic questions regarding bicycle were asked, namely bicycle ownership, usage for daily needs such as commuting and shopping and the usage for leisure trip. The result is shown in the figure below. For comparison, data from STATISTIK Austria⁶ and VCÖ⁷ are shown together, as well as the result from the survey in 2009. It has to be noted that the data from STATISTIK Austria is per-household data while the data from VCÖ is per-capita data.

Bicycle ownership is high in Lower Austria with more than 80% of the respondents answering that they own. The number in Vienna is lower with approximately two thirds answering that they own bicycle. The answer is in line with the government-organised mobility survey in 2009 as well as the OBIS survey in the same year and thus the survey is supposed to represent the population in terms of bicycle ownership.

⁶ STATISTIK Austria (2011). Ausstattungsgrad der Haushalte. Bundesländerergebnisse. http://www.statistik.at/web_de/static/ausstattungsgrad_der_haushalte_-_bundeslaenderergebnisse_059000.pdf

⁷ VCÖ (2013). Österreicher besitzen mehr als sechs Millionen Fahrräder - Fahrrad braucht nach Winter ein Service - 06.03.2013. Press Release. <http://www.vcoe.at/de/presse/aussendungen-archiv/details/items/vcoe-oesterreicher-besitzen-mehr-als-sechs-millionen-fahrraeder-fahrrad-braucht-nach-winter-ein-service-06032013>

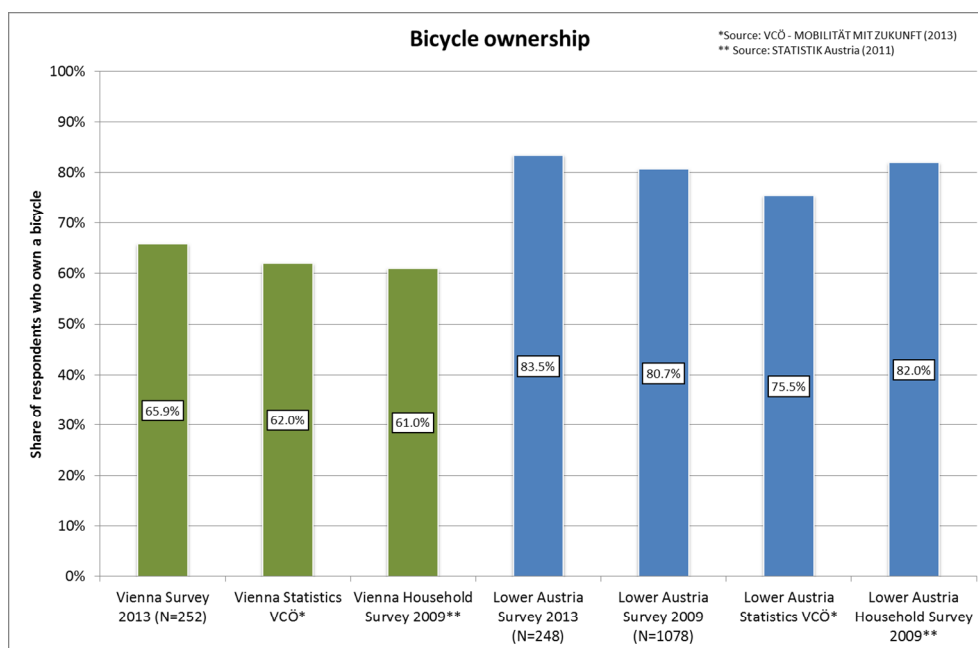


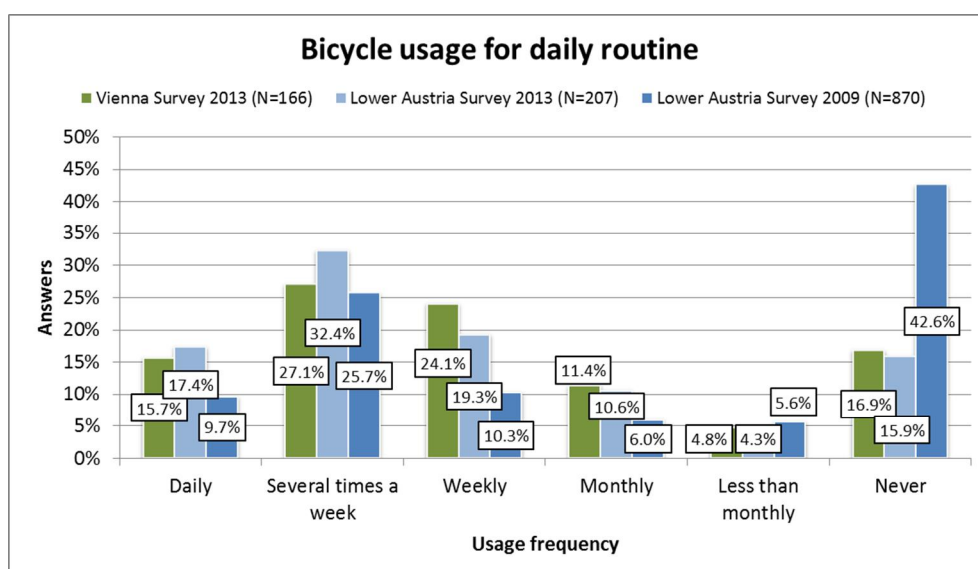
Figure 6-5 Bicycle ownership of the respondents and residents in the study area

Source: VCÖ (2013), **Source: STATISTIK Austria (2011) and CS7survey

Regarding the bicycle usage for everyday routine trip purpose, comparison of the Lower Austrian data in 2009 and 2013 shows that less respondents use bicycle monthly, less than monthly or never while more respondents use daily, several times a week or weekly. This implies that there is a general uptrend in the bicycle usage, at least in Lower Austria.

Similar uptrend in Lower Austria can be observed through the comparison of 2009 and 2013 data for leisure trips. Viennese people use less for leisure activities compared to Lower Austrians.

At large, similar distribution of the usage frequency can be observed both in Lower Austria and Vienna and both for daily routine trips and leisure trips, with approximately half of the respondents ride bicycle once or several times in a week.



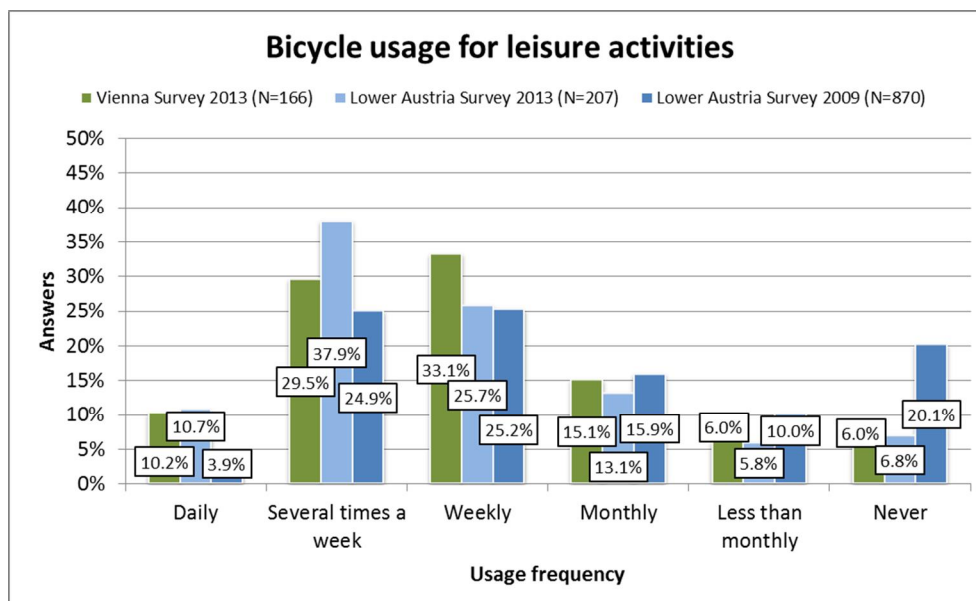


Figure 6-6 Bicycle usages of the respondents (CS7 survey)

6.3.3 Respondents' Background Related to ICTs

In the survey, three questions related to the ICTs were asked in order to identify the tendency of the respondents' familiarity to the ICTs. The first question was regarding the experiences with Internet-based services such as on-line banking, on-line shopping, and on-line ticket and hotel reservation and the respondents were asked to self-evaluate their familiarity. Although the proportion of very experienced, experienced, OK, less experienced, and inexperienced are different in the two surveyed regions, approximately two thirds self-evaluates that they are familiar with the Internet-based services and the rest evaluates less familiar.

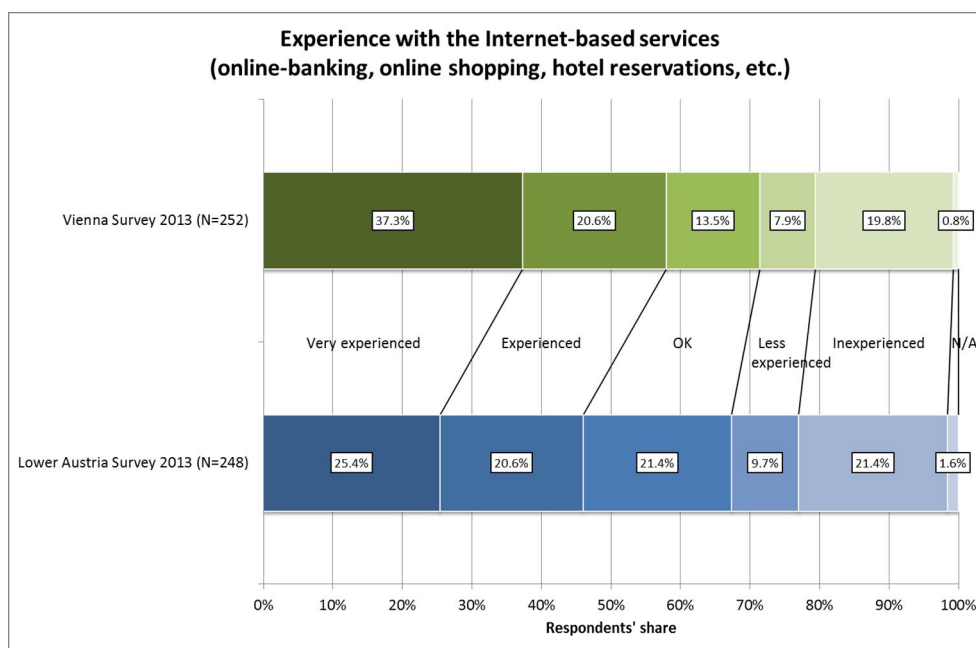


Figure 6-7 Respondents' familiarity with internet-based services (CS7 survey)

The second question was similar to the first one while the focus is on the automatic ticket vending machines such as the one at the railway station and the bar-code authorised ticket such as the

arilinesqbording pass. The respondents were asked to what extent each system is acceptable for them.

The ticket vending machine (below in the figure) is much accepted both among the Viennese and Lower Austrian respondents and thus such user interface appears to be well accepted.

The barcode-based ticket is less accepted than the ticekt vending machine. Especially, approximately half of the respondents from Lower Austria does not provide any answer, which implies that much of the respondents do not have an idea what exactly the ticket with barcode is. However, still, between one-third to half of the respondents will accept such ticket and thus the respondents are to some extent familiar with such recent ICT-based ticketing techniques.

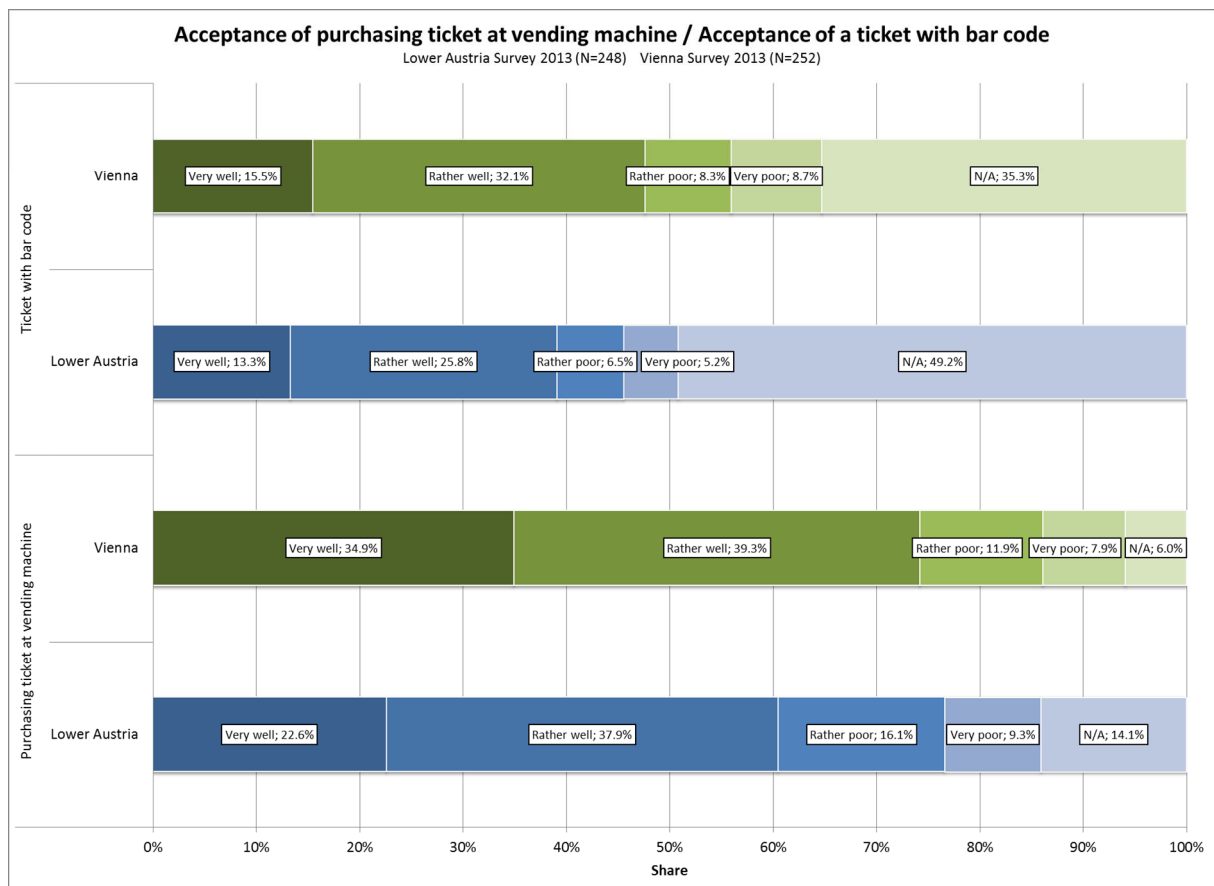


Figure 6-8 Respondents' acceptance of ticket oriented solutions (CS7 survey)

The usage of travel planners were included in the survey. About one-third do not use the on-line travel planner regularly and the rest use it. The survey included the question to the representative travel planners that are used in Austria, and the result subdivided into each travel planner is as shown in the table.

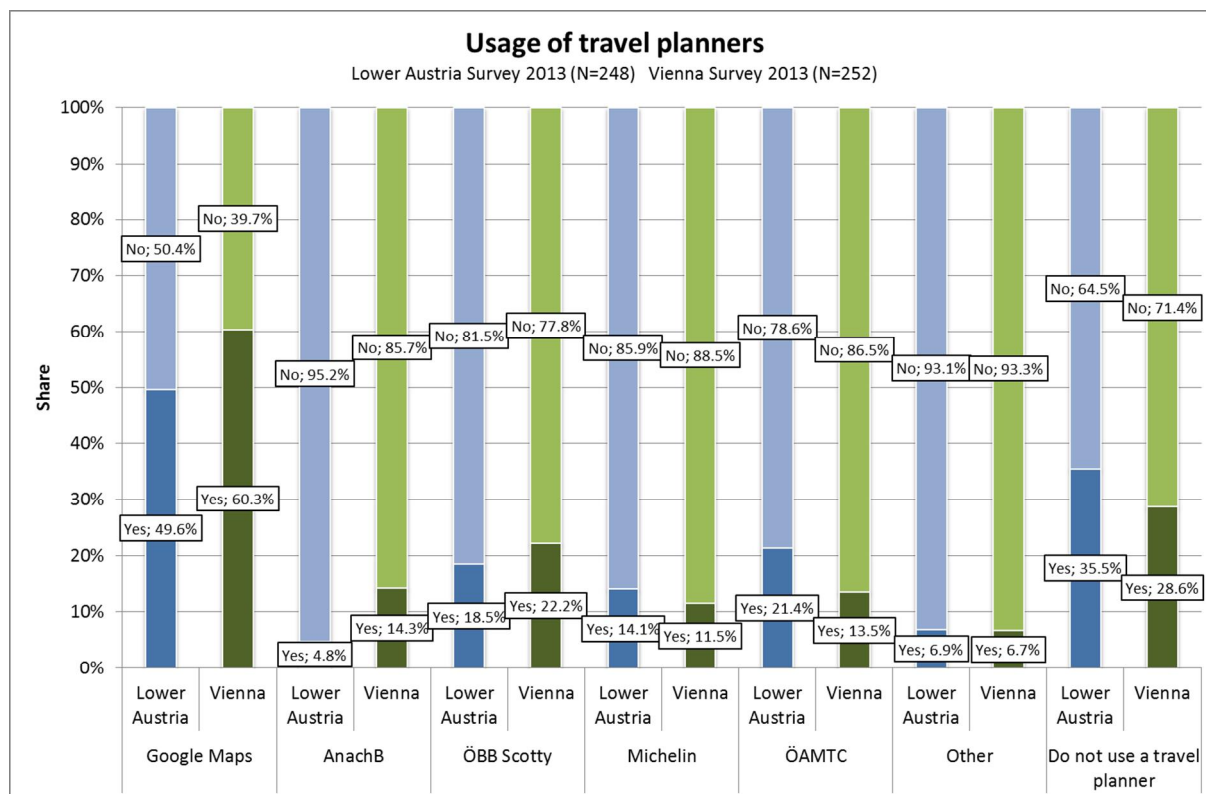


Figure 6-9 Respondents' usage of travel planners (CS7 survey)

At large, roughly two-thirds of the respondents appear to be familiar with the ICT-based services. Thus it can be assumed that about the same proportion of the people has higher potential to use the bike-sharing schemes, which are nowadays applying ICT-based techniques fully as their user interfaces, and the rest may have difficulty or may find some barrier to use the bike-sharing due to such ICT-based interface. However, as the high acceptance to the ticket vending machine implies, and the request by the non-users for an easy booking system as their requirements for their potential usage of bike-sharing system shows as shown later, the improvement of the user interface will make it possible to overcome such barrier due to the unfamiliarity to the ICT-based user interface.

6.3.4 Awareness and Usage Experience of Bike-Sharing Schemes

In the survey, the respondents were asked if they were aware of the bike-sharing schemes implemented in the region as well as a German nationwide one. %Citybike Wien+(Citybike Vienna) has been in operation in Vienna since 2003 and thus it is approximately 10 years since it commenced. Lower Austria had %Freiradl+with staffed renting station until 2009, and it is replaced with %LEIHRADL-nextbike+, which can be operated via telephone or smartphone app with 2D barcode.

The Vienna system, Citybike Wien, receives much attention by the respondents . 90% of the respondents in Vienna and 69% in Lower Austria are aware of Citybike Vienna. The current Lower Austrian system, LEIHRADL-nextbike attracts certain attention while its level is not high. Even among Lower Austrians, the awareness is still low. It is interesting that in 2013 survey, although it no longer exists, Freiradl, which was terminated in 2009, receives similar level of attention in Lower Austria after four years. However, at large, the Lower Austrian systems lose the attention by its inhabitants if 2009 and 2013 data are compared. There is no clear explanation for this so far; however, it appears that the change of the name and the transition of the scheme may have made the inhabitants away of the bike-sharing schemes.

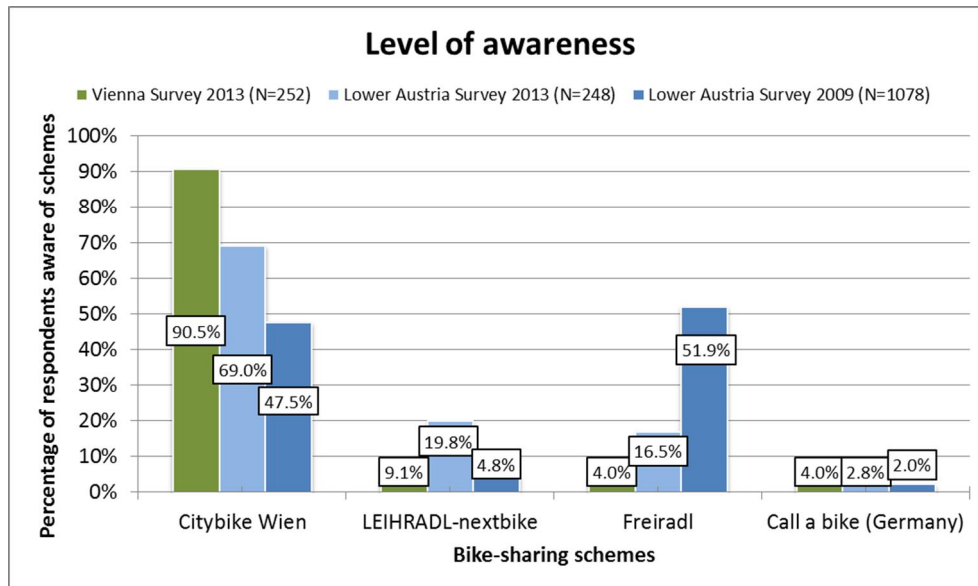
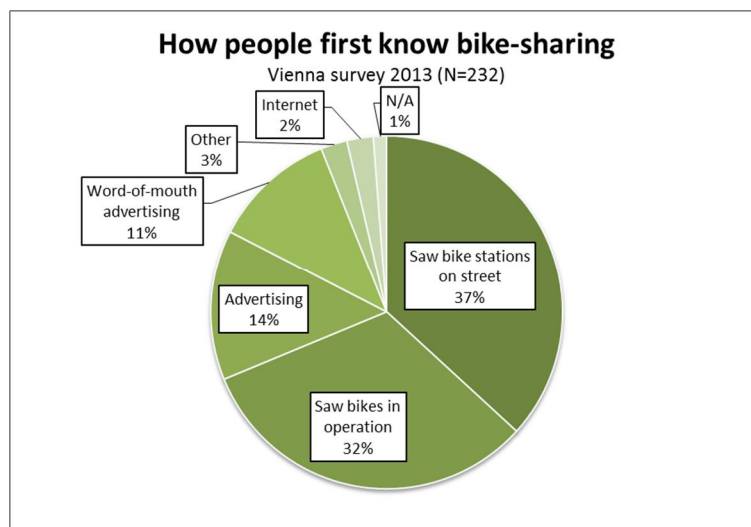


Figure 6-10 Respondents' awareness of bike-sharing schemes in the study area (CS7 survey)

How do people get to know about the bike-sharing schemes? The survey results highlights that many respondents became aware of bike-sharing schemes on street . either by seeing the station or by seeing the shared bicycle in use. Advertisement in the general term plays a certain role but to a limited manner, so does the word-of-mouth advertisement. The fact that 69% of the Viennese respondents first knew bike-sharing on the street highlights that the system in operation is the best advertisement to make the people aware of the system.



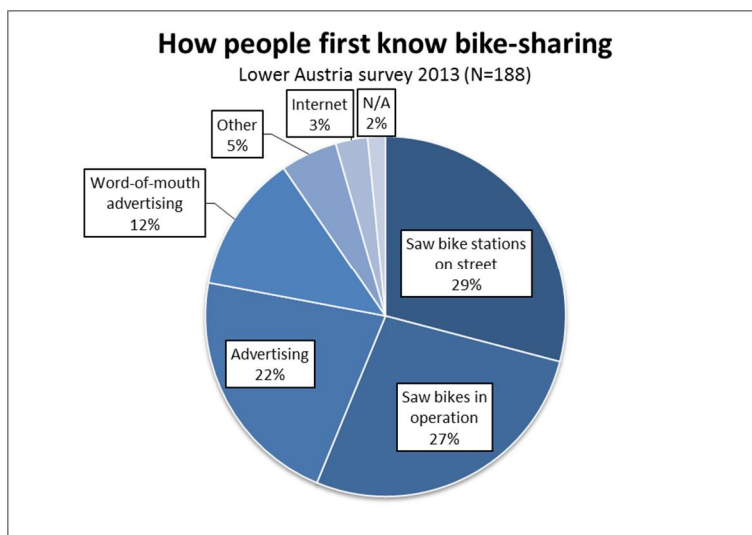


Figure 6-11 Respondents' source of knowledge about bike-sharing (CS7 survey)

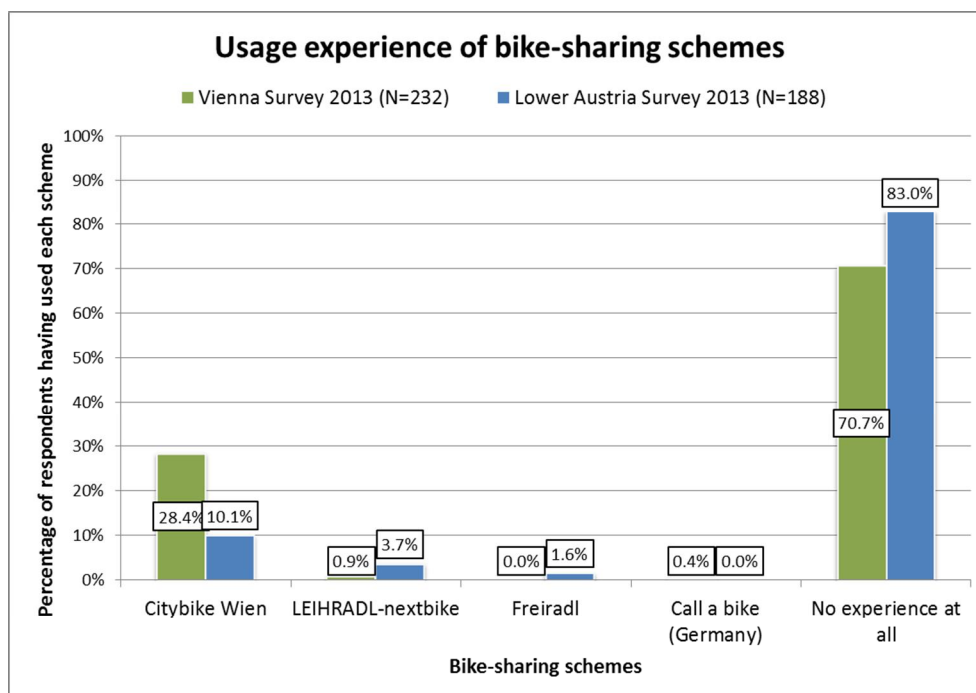


Figure 6-12 Respondents' experiences of bike sharing in the study area (CS7 survey)

Many of the respondents . 70.7% in Vienna and 83.0% in Lower Austria . have not yet used any bike-sharing schemes. 28% of Viennese respondents have used Citybike Wien at least once, while those from Vienna who have used Lower Austrian system is close to nonexistent. About 10% of Lower Austrians have used Citybike Wien in Vienna while less have experienced with the Lower Austrian systems. It has to be noted that there is no respondents in the both group (Viennese and Lower Austrian) who have used both Freiradl which existed until 2009 and LEIHRADL-nextbike which is in operation since 2009.

The comparison of 2009 and 2013 survey data about Lower Austrian respondents experience on Lower Austrian system (Freiradl and LEIHRADL-nextbike) shows that the respondents with experience has doubled during the four-year period.

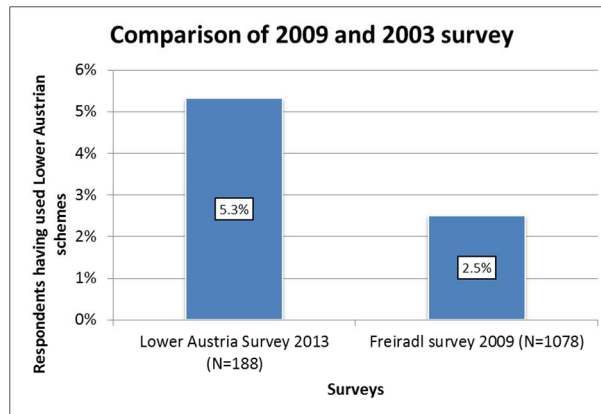


Figure 6-13 Percentages of Lower Austrians with usage experience of Lower Austrian System in 2009 and 2013 (CS7 survey)

The survey included the question about usage frequency for those who indicated the usage experiences with bike-sharing schemes. The actual usage frequency is fairly different in Vienna and Lower Austria. In Vienna, the shared bike is much used compared to the Lower Austrian counterpart and about one third uses it at least monthly or more frequently. The proportion of less often than quarterly+ is much higher in Lower Austria compared to the Viennese counterpart. Thus, at large, among those who uses shared bikes, Viennese tend to use more often than Lower Austrians.

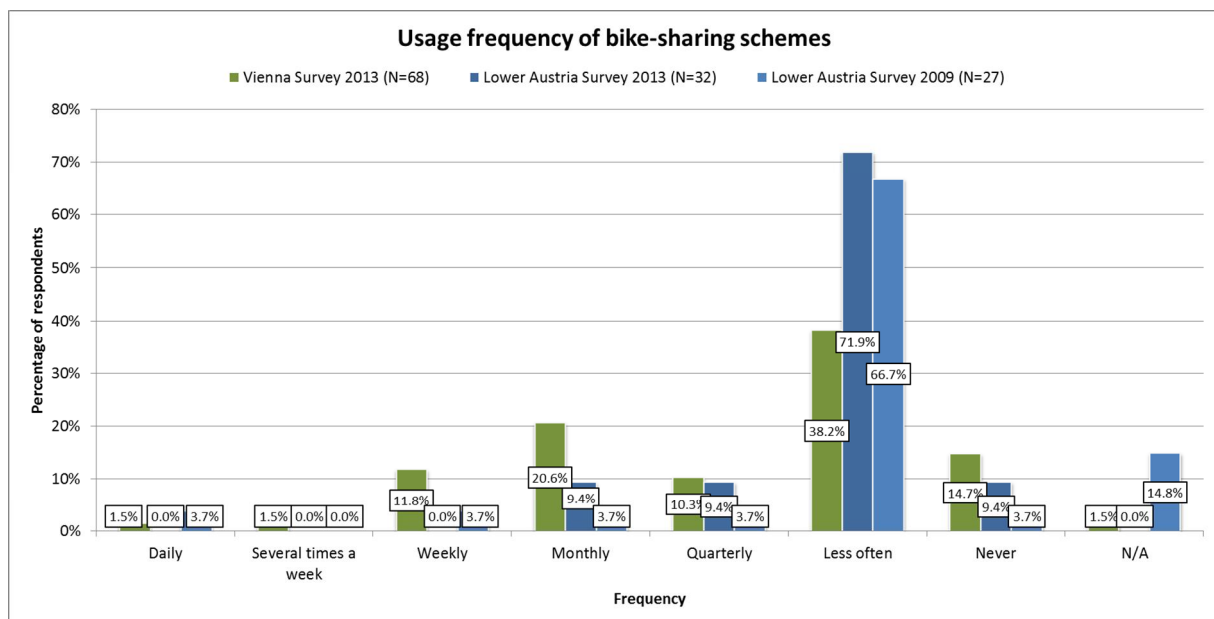


Figure 6-14 Usage frequency of bike-sharing schemes (CS7 survey)

Typical trip purpose with shared bicycles was asked in the survey and the result clearly shows that much usage is for leisure activities within the region and in other cities/regions. The usage for daily trip purposes such as commuting is limited; however, it is worth mentioning that 11% of the respondents in Vienna point out commuting as their typical trip purpose with the shared bicycle.

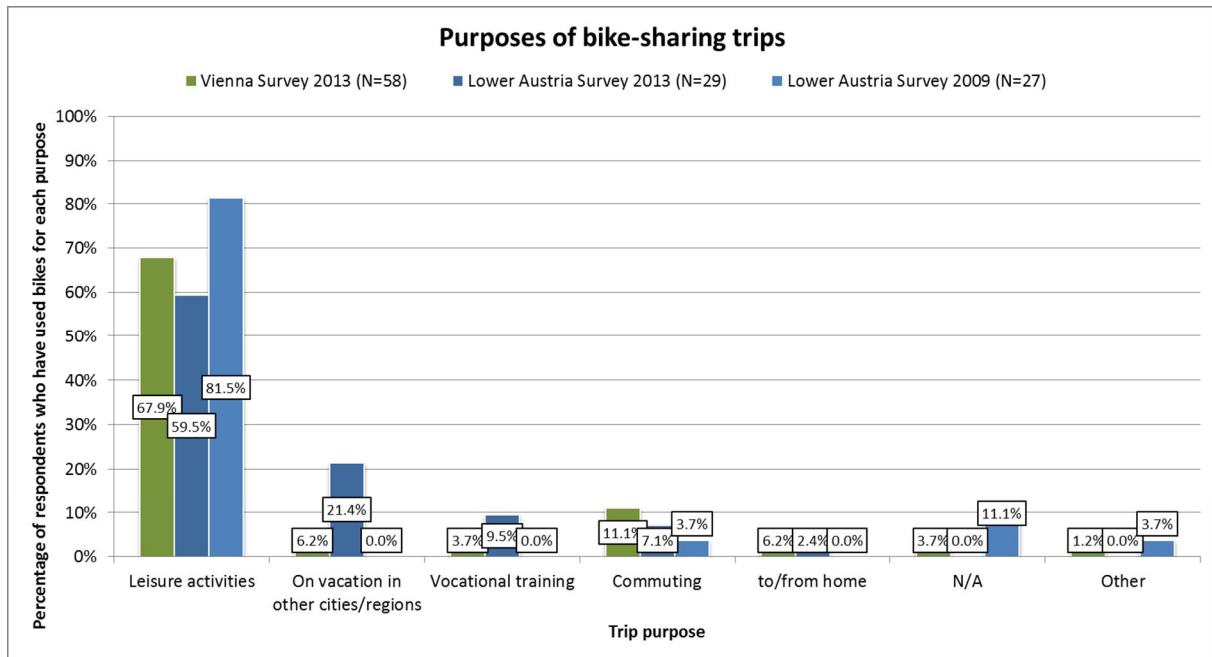


Figure 6-15 Most typical trip purpose with shared bikes reported by respondents (CS7 survey)

6.3.5 Response from Users to the Bike-Sharing in General

In the survey, the respondents were asked to indicate what they find as advantages of bike-sharing. Convenience, favourable (cheap) price, and environmental friendliness are often selected as the advantage, while certain number of respondents also point out simplicity for the usage, cycling being healthy, as well as it is faster than other transport modes and it is fun.

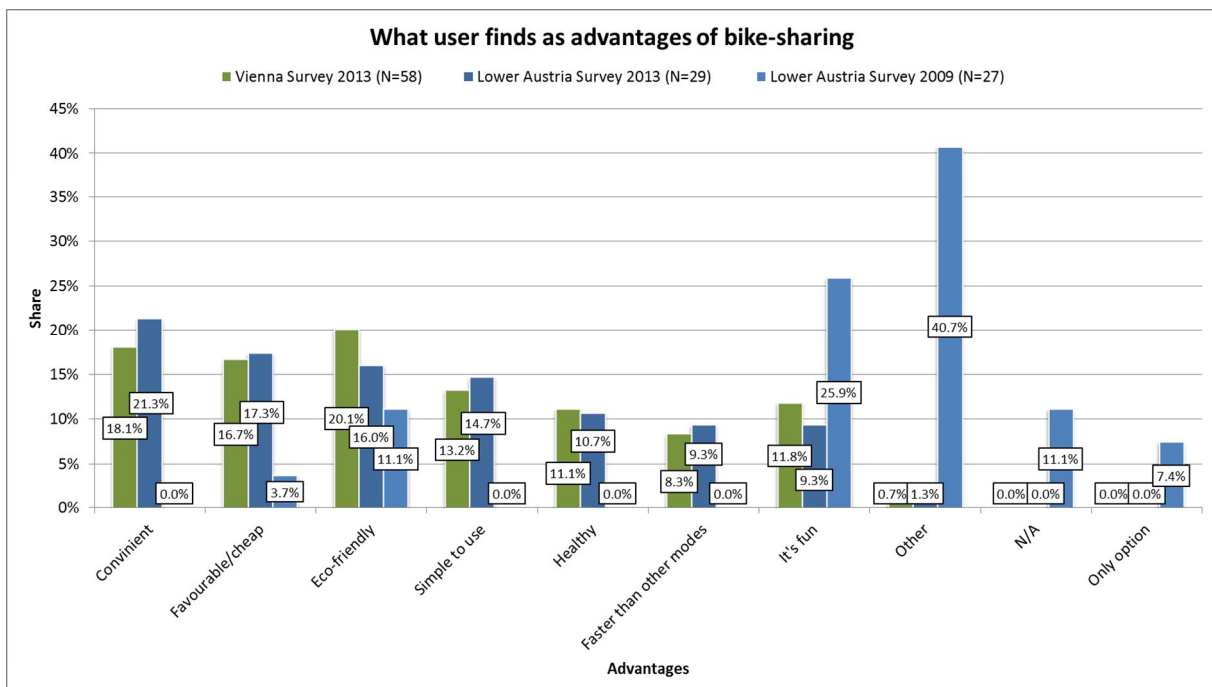


Figure 6-16 Respondents' opinion about advantages of bike-sharing (CS7 survey)

Regarding the pricing, much people are willing to pay 50 cent or 1 Euro per hour. Thus the current pricing of the system (as shown in the Tables) matches user acceptance regarding the price.

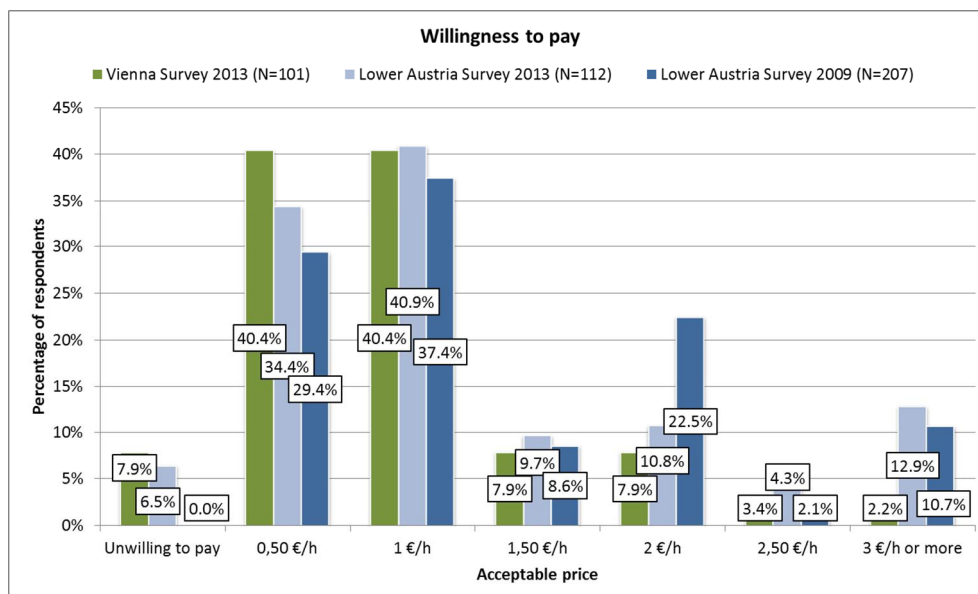


Figure 6-17 Respondents' willingness to pay (CS7 survey)

Table 6-3 Tariff of Citybike Vienna⁸

Usage period	Tariff
First 1 Hour	Free
Up to 2 Hours	EUR 1 / use
Up to 3 Hours	EUR 2 / use
Up to 4 Hours	EUR 4 / use
Longer use (up to 120 Hours)	EUR 4 per each one hour

Table 6-4 Tariff of LEIHRADL-nextbike in Lower Austria⁹

Usage period	Tariff
First 30 minutes (only in Wiener Neustadt, St. Pölten, and some area just north of Vienna)	Free
Per Hour	EUR 1
Per day maximum	EUR 8

6.3.6 User Response to Identification, Authorisation and Payment Method

The survey questions of which results are presented in this section are the most relevant to the ICTs as they are addressed to user identification, authorisation method, and payment method.

⁸ Citybike Wien (2013). CITYBIKE WIEN TARIFE+available at <http://www.citybikewien.at/>, retrieved on 24 June 2013

⁹ NÖ Energie- & Umweltagentur Betriebs GmbH (2013). .Fahrpreise available at <http://www.nextbike.at/1377.html>, retrieved on 24 June 2013

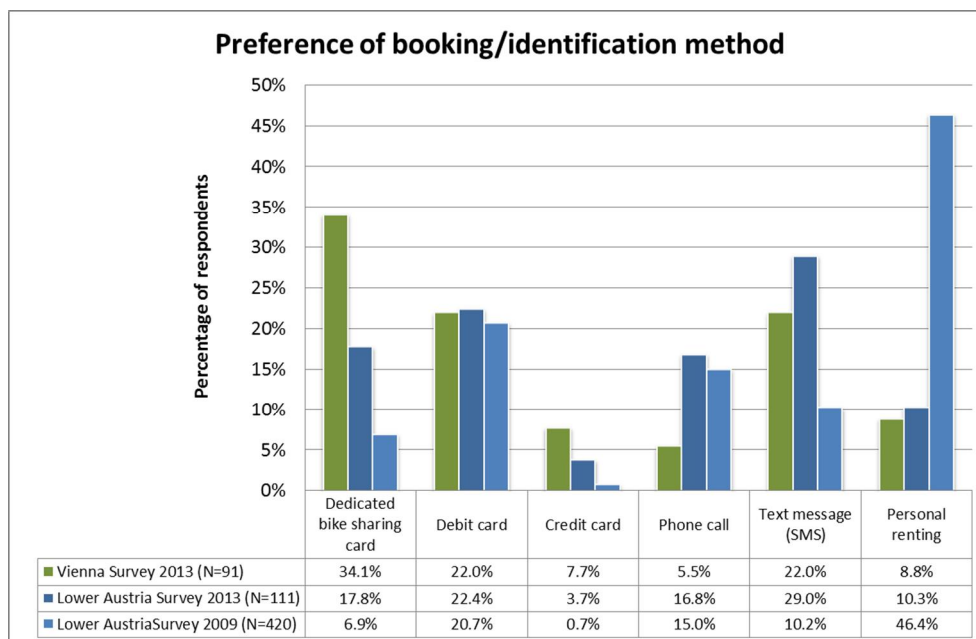


Figure 6-18 Respondents' preference for booking and identification methods (CS7 survey)

The survey respondents were asked for their preference of booking/identification method and payment method. Regarding booking/identification method, Viennese tend to prefer dedicated bike-sharing card much. Preference for the debit card is similar in Vienna and Lower Austria, and the data from Lower Austria in 2009 and 2013 shows that there appears no significant change to the preference for the identification by debit card. The identification by credit card is preferred more in Vienna but the overall preference at large is limited. Identification through phone call is more preferred in Lower Austria at the similar level in 2009 and 2013. Identification by text message is increasingly preferred. Preference for personal renting drastically fall down if 2009 and 2013 data is compared.

At large, the respondents tend to prefer the automated identification more and the identification through the staff is not much preferred.

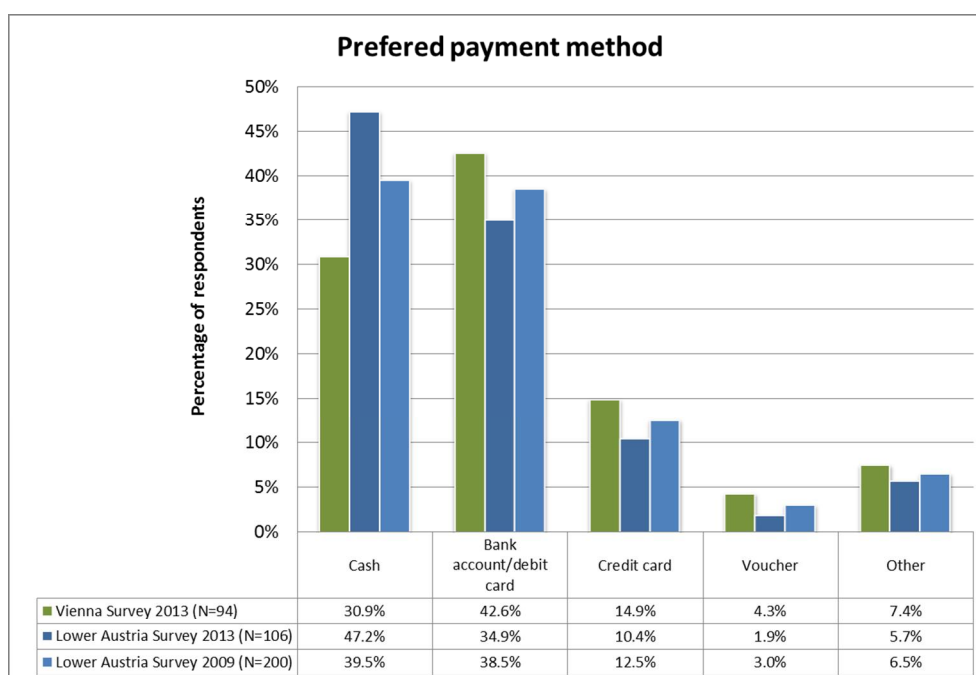


Figure 6-19 User preference of payment method (CS7 survey)

Those who have used bike-sharing schemes at least once were asked how they find various potential new developments in the future, namely:

- Opportunity to report broken bicycles (e.g. through apps).
- App indicating general conditions of bicycles.
- Option for short-term reservation (if there are only a few bikes available at the station).
- QR Code for user identification.
- Palm scan as user identification.
- Face recognition as user identification.
- Fingerprint as user identification.

Among these, opportunity to report broken bicycles and option for short-term reservation are evaluated as very useful developments, followed by (smartphone) app indicating general conditions of bicycles. The result clearly shows that these have high potential for the future development to make the bike-sharing schemes better.

Potential developments for user identification including QR code and other biometric identification tend to be evaluated useless. Considering that the users tend to prefer card-based or phone-based identification, it appears much better to remain with such bike-sharing systems identification method as the users do not find other identification methods.

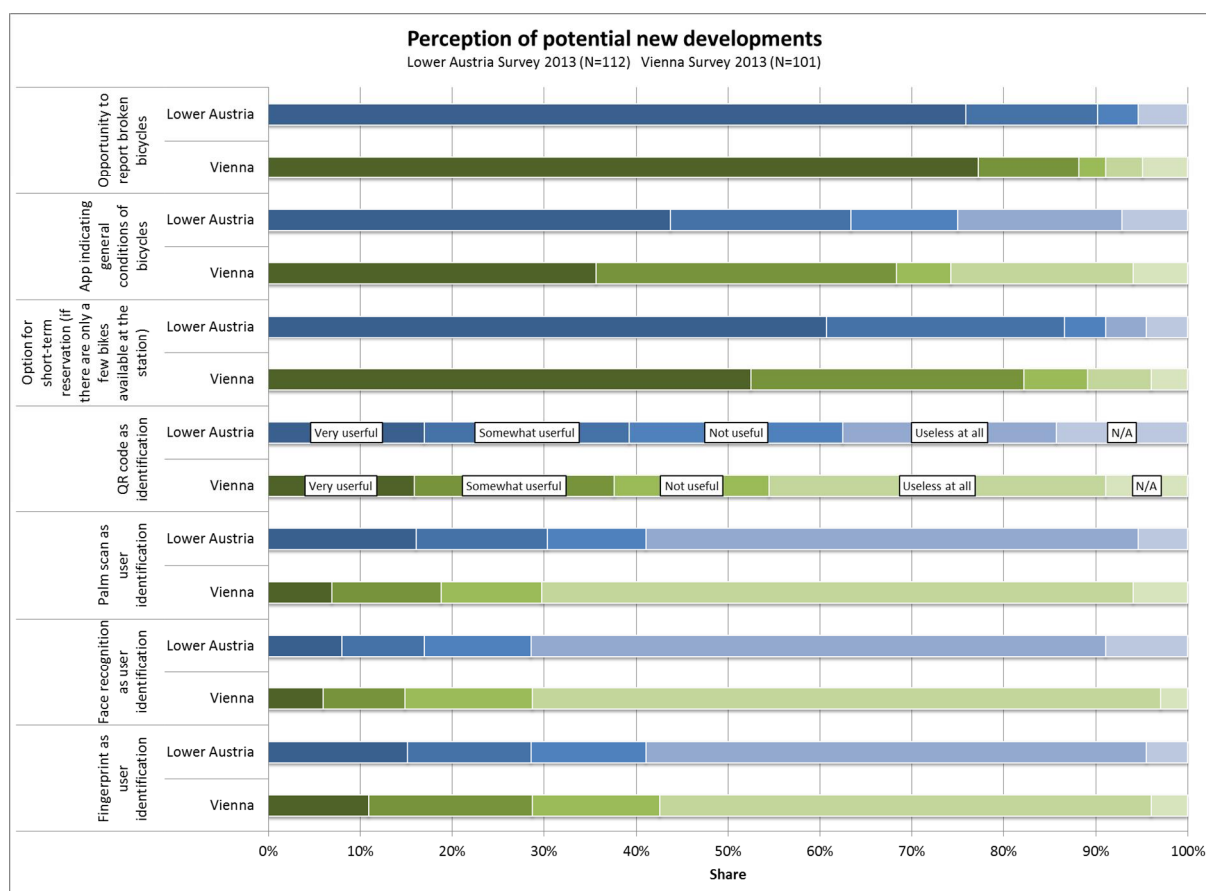


Figure 6-20 Respondents' perception of potential new developments (CS7 survey)

6.3.7 Response from Non-Users to the Bike-Sharing in General

In the survey, those who indicated that they had not used bike-sharing schemes yet were asked if they find themselves with potentials to use such bike-sharing schemes. The result is different between those who answered that they are familiar with the term bike-sharing and those who are not familiar with the term bike-sharing. In both regions (Vienna and Lower Austria), the proportion of those who

answers that they potentially use the bike-sharing is higher among those who are familiar with the term bike-sharing.

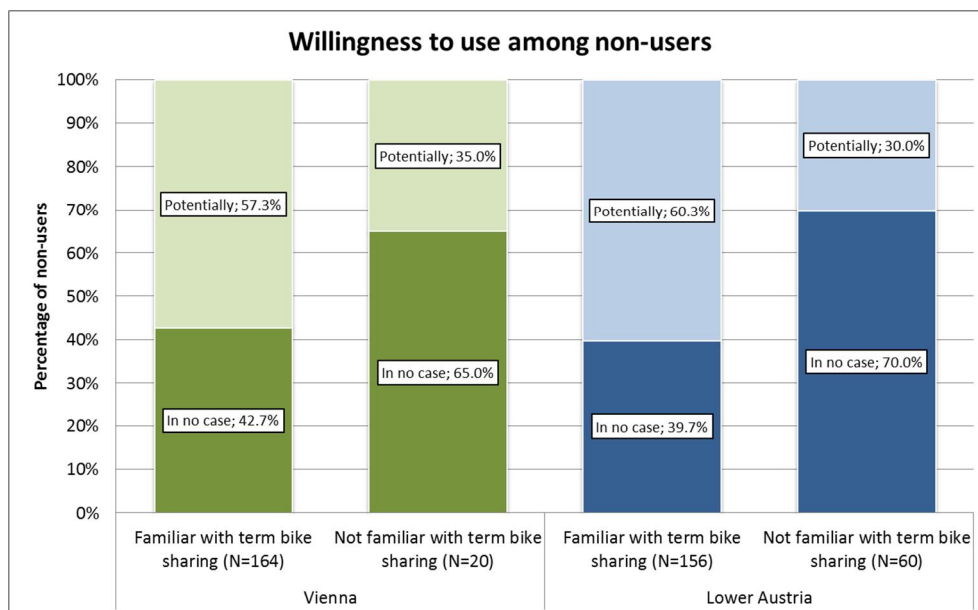


Figure 6-21 Willingness to use among non-users (CS7 survey)

The non-users who answered that they are familiar with the term bike-sharing were also asked what do they require to use bike-sharing schemes. As the same question was asked in the Lower Austria Survey in 2009, the result from this survey is also presented in the figure. The most wanted thing is the denser network of the stations, followed by easy booking systems and better bikes. This implies that the aspect relevant to the network planning and service provision is the most important, while the aspects related to ICTs and the bicycle itself have much room for improvement in the future.

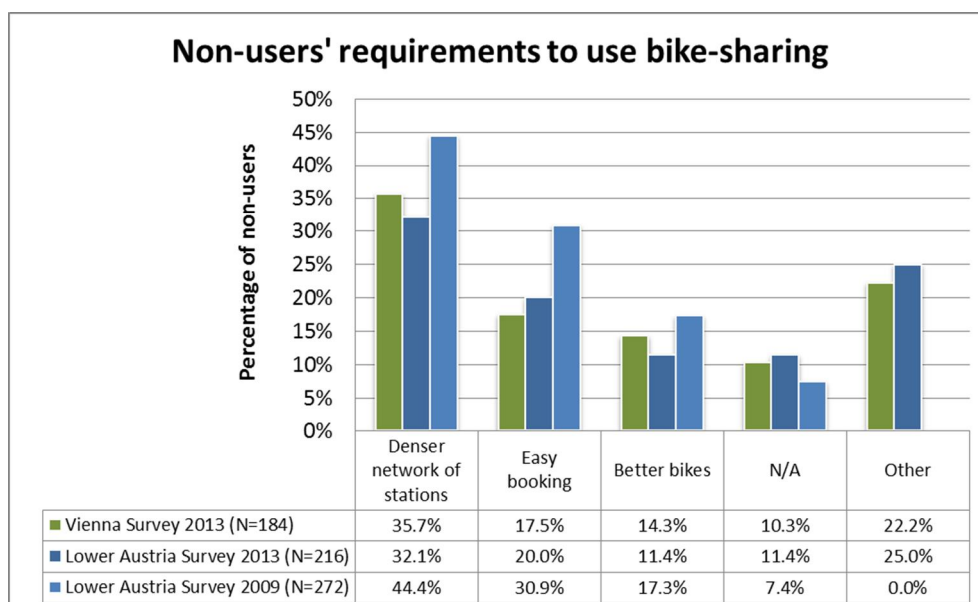


Figure 6-22 Non-user's requirements to use bike-sharing (CS7 survey)

7 SURVEY 1 FOR CASE STUDY 9 - GRASS-ROOT COOPERATIVE SMARTPHONE-BASED CAR-SHARING

7.1 EXECUTIVE SUMMARY OF THE SURVEY

This case study investigated four car-sharing groups in (rural) Austrian municipalities where conventional and electric vehicles are shared and booked via a Smartphone-based system called CARUSO. This grass-root cooperative car-sharing is very well established in all of the four analysed municipalities.

For the survey four focus group interviews with members of the car-sharing groups were conducted in January and February 2013. The aim of the focus group interviews was to find out how the respondents apply car-sharing with the booking system CARUSO in their daily life, what their motivation was for doing car-sharing and what advantages and disadvantages car-sharing has for them. The interviews were made with three to eight members of each group and were all in all quite balanced regarding age and gender of the respondents. The three municipalities Gaubitsch, Thüringerberg and Langenegg are situated in remote rural areas with dispersed settlement and a scarce public transport network while Bregenz is a densely populated urban area with a good public transport network.

The high usability of the CARUSO system is seen as a very important advantage for car-sharing. Even people with little experience with the Internet can manage to do their bookings on-line. Sharing a car is raising the awareness about the own mobility behaviour and can lead to changes in that. Sharing a car can actually substitute the ownership of a car even in remote rural municipalities.

7.2 SURVEY CHARACTERISTICS

7.2.1 Survey Methodology

In this case study four focus group interviews were conducted. Focus group interviews are moderated discussions on a defined topic of interest in an environment where people feel comfortable to talk to the interviewer and to each other. An important distinct feature of focus group interviews is its group dynamics and the type and range of data generated through the social interaction of the group (Rabiee 2004). Focus group interviews can provide information about a range of ideas and feelings that individuals have about certain issues, in this case about grass-root car-sharing. The aim of these focus group interviews was to detect the motivation, the use in daily life and the advantages and disadvantages of private car-sharing from the users' point of view. Through the interaction with other users during the interview, multifaceted examples of usages, motivations, examples etc. were captured.

The role of the moderator is to initiate the discussion with the central questions and to keep the discussion balanced and vivid. Concerning the number of focus groups it is suggested to run focus groups until a clear pattern emerges and subsequent groups produce only repetitious information. Usually three or four focus groups should be enough for a saturation of the issue. The optimum number of participants is between six and ten persons, as smaller groups show greater potential (Rabiee 2004). In the four focus group interviews, the smallest group (Thüringerberg) consisted of three persons while the largest group (Gaubitsch) consisted of eight persons. The remaining two focus groups comprised of six persons. In every focus group interview three employees from TU Vienna were present to moderate and monitor the discussions. The focus group interviews took 100 to 150 minutes. The discussions were recorded and transcribed.

The interviews took place between the end of January 2013 and the middle of February 2013 in the respective municipalities. In Gaubitsch, Thüringerberg and Langenegg, where the grass-root car-sharing is on the initiative of the municipality, the discussion was held in the municipal office. In Bregenz, where it is on private initiative, it was held at the housing block of the founder of the CARUSO system.

7.2.2 Geographical Area Covered by the Survey Research

Of the four focus group interviews one was held in the Austrian Federal State of Lower Austria, namely in Gaubitsch. The other three discussions took place in the Federal State of Vorarlberg, namely in the capital city Bregenz, in Thüringerberg and in Langenegg.

Table 7-1 Geographic coverage of the CS9 survey

Group	Gaubitsch	Bregenz	Thüringerberg	Langenegg
Federal State	Lower Austria	Vorarlberg	Vorarlberg	Vorarlberg
Inhabitants	892	28,007	671	1,064
Public transport	Very scarce public transport network (bus)	Good public transport network (bus)	Scarce public transport network (bus)	Scarce public transport network (bus)

- Gaubitsch is a small municipality with 892 inhabitants in 2012 situated in a remote rural area to the north of Vienna. The landscape of Gaubitsch is characterized by agricultural infrastructure and gentle hills 229 meter above the sea level. The public transport network is very scarce.
- Bregenz is the capital city of Vorarlberg with 28,007 inhabitants in 2012. Situated in the northern Vorarlberg, Bregenz is a densely populated urban area on the Lake of Constance with a good public transport network with frequent intervals.
- Thüringerberg is the smallest municipality of the four investigated. In the year 2012 it had 671 inhabitants. Thüringerberg is a mountain village on almost 900 meters above the sea level and is characterized by agriculture, tourism (e.g. biosphere-park) and the steep landscape. Thüringerberg is situated in a remote rural area in the middle-west of Vorarlberg with dispersed settlements and a scarce public transport network.
- Langenegg is also a municipality shaped by agriculture and tourism with 1.064 inhabitants in 2012. It is situated south-east of Bregenz and the hilly landscape lies between 690 and 912 meter above the sea level. Due to the dispersed settlement public transport can not serve all the people in this municipality.



Figure 7-1 CS9's survey area

7.2.3 Respondents

In this survey four focus group interviews were conducted. The number of the respondents differed between three and eight persons. In every focus group interview the founder or initiator of the car-sharing group was present. All in all the number of male and female respondents was balanced: from a total of 23 persons 12 respondents were male and 11 were female. The focus group interview in

Gaubitsch was dominated by male respondents (only one woman) whereas in the focus group in Thüringerberg exclusively female respondents attendant.

The age of the respondents of the four focus group interviews is also quite balanced: the persons are all between 30 and 50 or maximum 60 years old. There was no %eally young+ and no %eally old+ person joining the focus group interviews.

The majority of the respondents are economically active, working as municipal employees, workers, entrepreneurs, librarian, etc. Also pensioners and housewives were among the respondents.

Table 7-2 Respondents of the CS9 survey

Group	Gaubitsch	Bregenz	Thüringerberg	Langenegg
Number of respondents	8	6	3	6
Gender	One woman, seven men	Three women, three men	Three women	Four women, two men
Age	Middle-aged persons (30 . 60 years)	Middle-aged persons (30 . 60 years)	Middle-aged persons (30 . 40 years)	Middle-aged persons (30 . 60 years)
Occupation	Municipal employees, tailor, entrepreneur, worker	Employees, self-employed, artist, pensioner	Employee of the biosphere park office, housewife, librarian	Municipal employees, housewife, invalidity pension, volunteer

Concerning the ownership of a car most of the respondents have one private car using the car-sharing vehicle as second car. One exception is the car-sharing group in Bregenz where the majority does not own a private car and uses the car-sharing vehicles as main cars.

The majority of the respondents had prior experiences with the Internet. A few of the younger persons own Smartphones. Only a few persons in Langenegg do not use the Internet in daily life . they are booking the cars via telephone.

Due to the small sample size the results of the focus group interviews cannot be representative for the whole target group. Thus combinations with quantitative methods like the on-line- or telephone survey is very useful.

7.2.4 Solutions Considered

The grass-root cooperative Smartphone-based car-sharing can be counted to the solution family of Demand Responsive Transport Services (DRT).

7.3 RESULTS

With the interview transcripts which comprise 115 pages, much material was collected. The main results are presented here, with a detailed list with information about the specific municipalities below.

7.3.1 General Findings

The grass-root cooperative Smartphone-based car-sharing with the CARUSO system is very well established in all of the four analysed municipalities. The system has a very high usability which is a precondition for using it at all. Once a user is logged on he or she can see the availability of the car and make an own reservation with a few clicks. This easiness of booking and using a car-sharing car is the success of CARUSO in the different municipalities. Even older people and people with little experience with the Internet have no problems booking the car. As all of the four investigated municipalities have electric vehicles to share, the CARUSO tool is also helpful for estimating the actual range of the EV.

7.3.2 Founding of the Car-Sharing Groups

All four car-sharing groups have different stories and motivations for the founding of their car-sharing group:

- In Gaubitsch in Lower Austria the idea about car-sharing with an electric vehicle developed in the course of a municipal renewal group. An additional motivation for the municipality was the high operating costs for their official car. The group in Gaubitsch is the youngest CARUSO member using it since August 2012. The group consists of 29 members from whom 22 are private persons, six associations and the municipality and its employees. These members are sharing one electric vehicle, a Renault Kangoo ZE Maxi with a large loading space which is leased by the municipality. For recording the trips there is a handwritten logbook in the vehicle and additionally the CARUSO mobile phone with GPS in the car. The key-box is in the bank adjacent to the municipal office and can be opened with a common PIN-code. Sometimes there is also a private hand-over of the keys and the car.
- The car-sharing group in Bregenz formed around the founder of CARUSO in the year 2011. With the establishment of an association they bought two cars, one electric vehicle (Citroen C-Zero) and a conventional car, a Peugeot. Two members of the car-sharing group are additionally sharing their old cars, a Smart and another Peugeot, with the group. The car-sharing group in Bregenz consists of 29 private persons using these four cars. For recording the trips the CARUSO mobile phone with GPS is in the car. The key-box is located in the basement garage of the housing block of the founder where all of the four cars are parked. Additionally there are two E-Bikes that can be shared.
- In Thüringerberg there has been already a test phase with an electric vehicle a few years ago but not in the course of car-sharing. In November 2011 the municipality leased an electric vehicle, a Mitsubishi i-MiEV, which is now used as car-sharing vehicle that can be booked via CARUSO. In Thüringerberg 12 persons are sharing the electric vehicle, among them municipal employees, employees of the office of the Biosphere Park and private persons. For recording the trips the CARUSO mobile phone with GPS is in the car. The key-box is in front of the municipal office and can be opened with a common PIN-code.
- The car-sharing group in Langenegg is the group with the most experiences in car-sharing among the four groups since they are doing it since approximately 11 years. In 2002 the municipality bought the first car-sharing car for different reasons: the idea about car-sharing developed in the course of a federal energy programme (E5+) with the goal of avoiding second cars. The second motivation for car-sharing was the high costs for kilometre allowances that the municipality had to pay. This first car-sharing car was a conventional one called E5+ and got replaced through a new car (Peugeot) in the meantime. Today the inhabitants of Langenegg are sharing the conventional car E5+. In December 2011 the municipality leased an electric vehicle which is shared by the employees of the municipality. Both cars, the E5+ and the EV, can be booked online via CARUSO, the E5+ can also be booked by telephone for all those people who are not very experienced with the Internet. Today the car-sharing group in Langenegg consists of 30 members. In the cars, CARUSO mobile phones with GPS for trip recording are installed. For the E5+ two keys exist and the hand-over is personal at the municipal office or putting the key in the mailbox. The municipal office is closed on weekends so sometimes there is a private hand-over of keys and car. Additionally to the cars there are two E-Bikes that can be shared.

The costs for car-sharing differ in each group as every group can choose the price model the best suitable for the members and their usage.

7.3.3 Motivation for Car-Sharing

As the municipalities have different motivations for starting car-sharing so the group members have: the motivation for doing car-sharing was one point of interest in the focus group interviews. One motivation for joining a car-sharing group was for all the members of the investigated groups the curiosity about this innovative system and to see if it will work. In Gaubitsch the project needed a certain number of supporters and members in the beginning. Here the respondents joined this enterprise just to get the project started and because they knew the other people in the group. Another very important motivation for the people was saving: saving a second car or even saving the main car, saving of costs and saving of emissions through sharing a car. If the car is seen as one means of transport out of many and is used only for special purposes, the willingness for car-sharing is higher. Thus the relationship to a car is an important precondition for doing car-sharing or not. For a person

interviewed in Langenegg, joining the car-sharing group was even humbling in the beginning: he had to sell his own car because of financial reasons and did not feel comfortable in the shared car at the beginning. He had the feeling of losing a status symbol.

There were only a few concerns at the beginning they were primarily about the use of an electric vehicle. The main concerns referred to the driving range of the car, the silent driving and the driving in winter. Concerns about car-sharing in general were very little and referred to possible damages and to the availability of the car when needed.

7.3.4 Location and Usage of the Car-Sharing Car

For the car-sharing users the location of the car is very important. The smaller the distance to the car the more attractive is car-sharing for them. The respondents distance to the car-sharing cars is between two minutes and ten minutes on foot or by bike. As a limit they stated 15 minutes on foot. The car-sharing cars are used for private and for business trips and in all four municipalities there is a very high mobility with the shared cars. In Gaubitsch and in Langenegg there is even the idea about buying a second car for car-sharing. The four car-sharing cars in Bregenz are mainly used for private purposes like shopping, picking up of persons, transporting things, leisure time, visiting the doctor etc. In the other three municipalities the cars are used for private purposes and for business purposes like meetings, events, transports or deliveries. Although the cars are mostly used during weekdays they are booked very well also in the evenings and on weekends. The participants of the focus groups stated that since they are doing car-sharing they are more conscious about their mobility behaviour and combine different purposes on one way more often than before.

The possibility of ridesharing is not wide disseminated in the groups until now, and when it is done it is used more often for business purposes than private (for example visiting a meeting together). But there is a new function for the app under development which will facilitate ridesharing. In Gaubitsch is the idea of organising a weekly ridesharing for elderly people to go shopping for example.

Most of the participants of the focus group interviews own a car and the car-sharing car replaces a second car. In a few cases the car-sharing car even substituted the own car, which was sold after people started car-sharing. This means that car-sharing can substitute the ownership of a car even in remote rural and mountain areas like Thüringerberg. One special case is the group in Bregenz which is almost car-free and where the four car-sharing cars are used as main cars.

7.3.5 Advantages of Car-Sharing

From the users point of view the following advantages of car-sharing exist:

- High usability of the on-line booking system CARUSO. Booking a car-sharing car on-line is very simple even for persons with little experiences with the Internet. For the people it is seen as a very easy way of renting a car. The booking system allows reservations months in advance so one can book as soon as the schedule is fixed (e.g. visiting a doctor). The introduction of the on-line booking system is also advantageous for the municipal administrations where time can be saved for administrative work like answering the phone for every car-sharing booking.
- The small community where people know and trust each other is also a big advantage for private car-sharing. There are no problems; the people have a higher responsibility for the others and knowing each other can facilitate the hand-over of keys.
- The respondents like to drive an electric vehicle and enjoy the silent and smooth driving and the good speed-up of the car. Other advantages of EVs are that they raise the awareness for the environment and they help to practise an energy-efficient way of driving. Making good experiences with an electric car lifts up fears of this new technology and maybe influences the choice by the next car purchase. Sharing an electric vehicle also means thinking about the person driving after you because of the battery and the range. Through the on-line booking tool CARUSO one can see where the person driving the car before is going and the distance he or she will cover with the electric vehicle.
- For the users a big advantage of car-sharing is the costs which are composed differently in each municipality. The grass-root car-sharing is cheaper than driving with the own car and than conventional car-sharing and it can substitute the purchase of a second car. Another very important point is the cost transparency which raises awareness for the real prices of owning and

driving a private car. People who share their own car with others get money for that and share the costs for fuel, service, tires, etc.

- An advantage of car-sharing in general is getting a new way of thinking about car usage. The people started to think whether they really need a car for their special purpose and when they opted for the car they tried to combine different errands and saving additional ways through that. The car-sharing car is more valued in that term than an own car which is often taken for granted.
- A further advantage the respondents mentioned is the good maintenance of the car-sharing cars. The car-sharing users do not have to care about tyre changes in autumn or spring, about the annual car service or the annual fee to use motorways. Through that the people are saving time and money.
- The location of the car which is (except in Bregenz) in front of the municipal office is another advantage because car-sharing is visible through that directly in the municipal centre. The electric car-sharing cars have commonly a municipal logo on it which casts a positive ~~green~~ light on the municipality. Walking to the car-sharing car supports the community because people meet each other on the streets.

7.3.6 Disadvantages of Car-Sharing

From the users point of view the following disadvantages of car-sharing exist:

- The only disadvantage of the on-line booking system CARUSO is that it could set older people with no experiences with the Internet apart from using it. But this does not seem to be a serious problem because there are examples of older people using the system. In Thüringerberg even an 83-year old woman is booking the electric vehicle on-line by herself.
- The most disadvantages from the users point of view related to the use of electric vehicles are the short range as the main problem especially in winter, the high energy consumption due to heating or cooling the car, the sparse charging infrastructure, the long charging time and the silent driving which could be dangerous for pedestrians.
- As disadvantages for car-sharing in general the users mentioned the barriers of taking someone else's car, losing the status symbol if not owning a car and the lack of spontaneity because the cars need to be booked in advance.
- The condition of the car concerning cleanliness can be another disadvantage of sharing a car. If there is one person responsible for that it is no problem.
- Regarding to the location of electric vehicles the municipal parking sites which were not covered are seen as a big disadvantage, especially in winter. The snow must be shovelled every day and through the low temperatures the electric car needs more energy for heating, which reduces the driving range.

The respondents are very satisfied with the booking system, the organisation of the car-sharing and the costs for car-sharing. In Langenegg and Thüringerberg the respondents are not really satisfied with the condition of the cars; in Bregenz and Gaubitsch where one or more persons are responsible for the car, the users are satisfied. Another point of dissatisfaction is concerning the sparse charging infrastructure for electric vehicles and the frequent unavailability of the car-sharing vehicle, especially in Langenegg and Gaubitsch.

7.3.7 Detailed List of Findings

Table 7-3 Focus group characteristics and results in CS9 survey

Group	Gaubitsch	Bregenz	Thüringerberg	Langenegg
Interviews				
Interview date & time	28.01.2013 6 p.m. . 8:30 p.m.	12.02.2013 5 p.m. . 7 p.m.	13.02.2013 6 p.m. . 8 p.m.	14.02.2013 1 p.m. . 3 p.m.
Interview place	At the municipal office in Gaubitsch	At the housing block of the founder of CARUSO in Bregenz	At the office of the biosphere park in Thüringerberg	At the municipal office in Langenegg
Length of interview recorded	2 hours 30 minutes	1 hour 40 minutes	1 hour 40 minutes	1 hour 40 minutes
Focus-group participants	8 users from Gaubitsch (1 woman, 7 men)	6 users from Bregenz (3 men, 3 women)	3 users from Thüringerberg (3 women)	6 users from Langenegg (2 men, 4 women)
Information about municipalities				
Federal State	Lower Austria	Vorarlberg	Vorarlberg	Vorarlberg
Inhabitants*	892	28,007	671	1,064
Public transport	Very scarce public transport network (bus)	Good public transport network (bus)	Scarce public transport network (bus)	Scarce public transport network (bus)
Information about groups				
Group Size	29 members (22 private persons, 6 associations and the municipality) 12 . 15 % active+ users/month All members know each other.	29 members (all private persons) Members do not necessarily know each other.	12 members (municipality, office of the biosphere park and private persons) All members know each other.	30 members (municipality, private persons) Around 15 people using it actively All members know each other.
Number of cars	1 car	4 cars	1 car	2 cars
Type of car	1 EV ¹⁰ (Renault Kangoo ZE Maxi, a van)	1 EV (Citroen C-Zero) 1 Peugeot 206 1 Peugeot 306 1 Smart 2 E-Bikes	1 EV (Mitsubishi i-MiEV)	1 EV (only used by municipal staff) 1 Peugeot 107 (used by community members) 2 E-Bikes
Type of contract	The municipality offers a leased EV.	Set up an association . bought two cars (EV and Peugeot), the other two cars are private cars owned by two group members.	The municipality offers a leased EV.	The municipality offers a leased EV and the Peugeot owned by the municipality.

¹⁰ EV = Electric Vehicle

Group	Gaubitsch	Bregenz	Thüringerberg	Langenegg
Booking system	CARUSO	CARUSO	CARUSO	CARUSO & telephone (call at the municipal office)
Recording of trips	Handwritten logbook in vehicle and additionally CARUSO mobile phone (GPS) in the car.	CARUSO mobile phone (GPS) in the car.	CARUSO mobile phone (GPS) in the car.	Handwritten logbook in vehicle and additionally CARUSO mobile phone (GPS) in the car.
Hand-over of keys	Key-box in the bank near the municipal office (with a Code). Sometimes private hand-over of keys and car.	Key-box in the basement garage of the housing block.	Key-box in front of the municipal office (with Code).	They have 2 keys, hand-over at the municipal office (personal or putting it in the mailbox). Office is closed on weekends! Sometimes private hand-over of keys and car.
Location of the car(s)	At the centre of municipality, near the municipal office.	In the basement garage of the housing complex.	In front of the municipal office.	In front of the municipal office.
Car-sharing since...	August 2012; Using CARUSO since the beginning of the project.	Since two years, since 2011; development and usage of CARUSO.	Since November 2011 (EV), also using CARUSO since that time.	Fifty since 2002; EV since December 2011; using CARUSO since April 2011.
Main users	Main users are municipal employees, the initiator of the project, a tailor, a gardener, private persons (private use), associations (e.g. voluntary fire brigade).	Main users are private persons living in or near the housing complex.	Main users are municipal employees, employees of the office of the biosphere park and private persons.	Main users are municipal employees and volunteers using the EV (using it for free). The school principal or local companies can also book the car for educational purposes. Private persons are using the so-called "Fifty", a shared car.
Gender	There are more male than female users.	The number of male and female users is balanced.	There are more female than male users; men are using it mainly for business purposes.	The number of male and female users is balanced, maybe more female users.
Age	The car is mainly used by middle-aged persons (30 - 50 year old).	The cars are mainly used by middle-aged persons.	The car is mainly used by middle-aged persons; one student using it sometimes; one	The cars are mainly used by middle-aged persons; young people are also

Group	Gaubitsch	Bregenz	Thüringerberg	Langenegg
Car ownership	Here, the car-sharing car is the second car; everybody has an own car (or even 2).	Two people are sharing their private cars with the other group members; one woman has got an old car; most of the users do not own a car.	83-year-old woman using it (booking it via the Internet!)	using the %ifty+ for going out on weekends.
Internet experiences of the users	Prior experiences with the Internet.	Prior experiences with the Internet.	Most of the people own a private car and take the car-sharing car as second car. One woman will sell her old main car.	Most of the people using the %ifty+ own a car and take it as second car. One man had to sell his car . %ifty+as main car.
Costs for car-sharing	99 " yearly membership fee, 10 Cent/km.	10 " yearly membership fee; 3 " per booking; 36 Cent/km (fair use: for a longer use . 3 km/hour are assumed and accounted).	The first half-day is for free, every following half day costs 15 Euro; members negotiate twice a year their monthly monetary contribution according to the expected amount of usage.	No basic/member fee anymore; Prices are graded by km (no time units); First 15 km: decreasing from 0,43 to 0,28 Cent/km, every further km costs 0,28 Cent/km.
Note: The costs for car-sharing differ in each group; every group can choose the price model the best suitable for the members and their usage.				
Beginning of the group				
On the initiative of...	Municipality	Private	Municipality & biosphere park management	Municipality
Motivation	For the municipality: high costs for their official car; Innovative system, curiosity; Joint project, knowing the people.	Willingness to share a car (own car is old and rarely used; another motivation for sharing it: no relationship to the car, used only for specific purposes); Prior experiences with other car-sharing models (conventional and in family); Curiosity if systems works;	Curiosity if system works; Just to try it; %aving+as motivation: saving of second car, emissions, money. Car-sharing car instead of buying a second car; In some cases even saving the main car (Selling the main (very old) car); First used it for business trips	For the municipality: high costs for their official car; Instead of a 2 nd or 3 rd car (big family); since children are older, using it less; Low costs as motivation (%ifty+ as a replacement for the own car which was too expensive); Not a good feeling in the beginning; losing a status

Group	Gaubitsch	Bregenz	Thüringerberg	Langenegg
		Use car-sharing as substitution for own car (own car is old), use car-sharing cars as main car when old car breaks down.	(library); then started using it for private purposes.	symbol.
Concerns at the beginning		A lot of people are wondering if it works; thought that car is damaged earlier with car-sharing.	<p>In the beginning . concerns about EV, afraid of driving it, automatic, silent driving, driving in winter.</p> <p>Concerns about the range of the car.</p> <p>Distance as main concern, also availability when needed, does it work when needed?</p> <p>No concerns about sharing, had experiences in family (never had an own car).</p>	
Distances to the CS car	5 min on foot; 1.5 km on foot or by bike (sometimes with the car).	<p>10 . 15 min on foot;</p> <p>2 . 3 min on foot;</p> <p>15 min on foot as a limit;</p> <p>Very attractive through small distances.</p> <p>People with greater walking distances are renting the car for a longer time.</p>	<p>15 min on foot; 7-10 min on foot (or sledging); 5 min on foot;</p> <p>A few people are taking the car to the car-sharing car (especially people who are using it for business trips).</p>	<p>A few minutes on foot, between 5 and 15 min on foot, come on foot or by bike.</p> <p>It is okay to go 15 min on foot. This distance does not influence the frequency of use, but it influences if people use car-sharing or not.</p>
Purpose of use	<p>Private & for business trips;</p> <p>Private: shopping, leisure, theatre, etc.;</p> <p>For business trips: the tailor uses it for delivering clothes, the gardener also for his deliveries, municipal</p>	<p>Mainly private;</p> <p>Private: for transporting things (garbage, musical instruments);</p> <p>In the evening when there is no public transport; for sports, picking up of people, for shopping, etc.</p>	<p>Private & for business trips;</p> <p>Private: shopping, visiting a doctor, picking up of persons, for leisure, for sports, in the evening when there is no public transport, visiting family/friends, for short trips.</p>	<p>Private & for business trips;</p> <p>Private: (fifty+) visiting a doctor/pharmacy, driving family members to the doctor, for leisure, going to the hairdresser, for short trips, for sports, for heavier transports, visiting</p>

Group	Gaubitsch	Bregenz	Thüringerberg	Langenegg
	employees are using it for events, meetings, etc. The associations are using it for transporting things (e.g. cables for a festival...).	<p>The cars are sometimes used for business trips, for fixed dates, but rather seldom.</p> <p>Combination of different routes and purposes;</p> <p>Car as one possibility out of a lot, multi modal, bike, public transport, etc.</p>	<p>For business trips: municipal employees and employees from the biosphere park office are using it for events, meetings, conferences, etc., employees from the library are also using it for business purposes.</p> <p>Sometimes combining private and business purposes (doing the shopping on the way).</p> <p>The car is used on weekdays, during the days (on business), in the evening (private), and sometimes on the weekends (private).</p> <p>Do not (until now) use the possibility of ridesharing.</p>	<p>friends/people in the hospital, etc.</p> <p>For business trips (EV): municipal employees are using it for events, meetings, etc. Volunteer workers are also using it for their work (for free);</p> <p>The EV is mainly used on weekdays (for business trips). The Fifty+ is very well booked both on weekdays and weekends (when the busses run less frequently).</p> <p>Rideshare is possible and it is used more often for business trips than private trips.</p>
Mobility with shared car(s)				
Frequency of usage	Almost every day since beginning of the project.	Cars are very often booked, also in the evening and on weekends. Seasonal differences, in summer people go by bike more often.	<p>Very well booked, thinking about a second car (petrol).</p> <p>People can book the car half a day or longer.</p> <p>Car is used also in evenings and on weekends.</p>	<p>The Fifty is very well booked; the car is often handed directly to the next user. It is also used in the evening and on weekends.</p> <p>Fewer users in summer.</p>
Alternatives if car-sharing car is not available	Taking the own car.	Taking one of the three other car-sharing cars; Public transport; Bike.	<p>Taking the own car;</p> <p>Public transport, go by bike;</p> <p>If there is no other possibility - shifting the appointment;</p> <p>Booking in advance: making the appointment</p>	<p>Use of public transport;</p> <p>Booking in advance: making the appointment at a day where the car is available.</p> <p>Ask a family member for the</p>

Group	Gaubitsch	Bregenz	Thüringerberg	Langenegg
			at a day where the car is available. Asking other group members for their private car (not often the case).	car.
Advantages/Disadvantages from users' points of view				
Advantages	<p><u>Booking system</u> Booking system is very easy to use even for people with less Internet experiences.</p> <p><u>Small community</u> Advantage of small community . people know each other: higher sense of responsibility for the car & more likely to ask for a rideshare (as you see in the booking system when and where another member is driving);</p> <p><u>Rewards</u>+for cleaning the car (free-km) as motivation.</p> <p><u>EV</u> EV . automatic transmission for easy driving;</p> <p>EV as motivation for car-sharing, raising awareness for environment;</p> <p>Good experiences with EV, people are getting used to it, maybe won't buy a conventional car next time; Car-sharing lifts up fears of EVs/new technology;</p>	<p><u>Booking system & CARUSO tools</u> Booking system is very easy to use.</p> <p>Mobile phone in the car makes logging easy compared to a handwritten vehicle log.</p> <p><u>Small community</u> The car is not the own one, but as I know the people who owns it, I drive more carefully (than conventional CS). I feel more responsible and obliged considering the other group members.+</p> <p><u>EV</u> EV is very easy to drive;</p> <p>No problems with charging stations (availability, density), good infrastructure;</p> <p>Silent EV as an advantage.</p> <p><u>Car-sharing in general</u> No problems with cars that do not belong to oneself . people are used to it (company/official cars).</p>	<p><u>Booking system</u> Easy way of renting a car.</p> <p><u>EV</u> More advantageous in summer.</p> <p>It's fun to drive, it is a nice driving;</p> <p>Logo on the car . advertising effect of the EV;</p> <p>Size of the car: small and handy car, good for 1 Person and still enough space for the shopping;</p> <p>Driving an EV as an instrument for practising an energy-efficient way of driving (saving energy with different driving styles);</p> <p>Using an EV requires to think about the users having the car after you: how far is my trip and how far can he/she get with the remaining energy in the battery: ⇒ Important to write in the booking system where you are going to;</p>	<p><u>Booking system</u> Booking system allows booking months in advance; one can book as soon as the schedule is fixed (e.g. visiting a doctor).</p> <p>Booking system via Internet . saving time for administrative work (answering the telephone).</p> <p><u>Small community</u> Knowing each other . trusting each other, no problems with late or lacking payments;</p> <p>In all the years . not one problem with damages, etc.;</p> <p>On weekends . no key-box . people know each other . can ask for using the car during the using time of the actual user.</p> <p><u>EV</u> EV: nice driving, people are concerned in the beginning about driving, but they love the car after that;</p> <p>EV has a good speed-up, the</p>

Group	Gaubitsch	Bregenz	Thüringerberg	Langenegg
	<p>Size of the car, loading space in car;</p> <p>Advertising effect, car is visible.</p> <p><u>Costs</u> Low costs . membership only for 1 year; Cheaper than owning a car;</p> <p>The costs for driving the car-sharing car are very transparent. Raises awareness for the costs of a conventional car.</p> <p><u>Car-sharing in general</u> New ways of thinking about car usage . also with private car;</p> <p>Walking a longer distance to the car supports the community, meeting people;</p> <p>Car-sharing raises awareness for own car usage.</p>	<p>Possibility of lending the car for a longer time, up to maximum 3 weeks! This works because there are three other cars left.</p> <p>Getting conscious about the own driving behaviour. Getting conscious about the real costs of a car.</p> <p>The possibility of adapting a car to the needed purpose/ occasion;</p> <p>Sharing a car . sharing the ecological burden;</p> <p>The CS car is more valued than an own car (where it is taken for granted).</p> <p><u>Costs</u> People who are sharing their own car get money from the others;</p> <p>Saving of costs through not owning a car.</p> <p><u>Location of the car</u> Small distances to the car-sharing car as a big advantage;</p> <p>Covered parking site (protects the cars from snow);</p> <p>No problems with parking space in the city.</p>	<p>There are Park & Charge sites at a lot of supermarkets . but access after shop closing time?;</p> <p>Quick charging stations are very good, but rare.</p> <p><u>Car-sharing in general</u> Easy way of renting a car.</p> <p><u>Costs</u> First half day of car-sharing is for free;</p> <p>Costs . cheaper than conventional car-sharing, cheaper than owning a car.</p> <p><u>Location of the car</u> Location of the car in front of the municipal office . car is visible for other people.</p>	<p>maximum speed is not important for the use (20 km to the next motorway);</p> <p>EV . silent driving as advantage;</p> <p>Leasing the EV as an advantage . gaining experiences and having the possibility to return the car without any problems.</p> <p><u>Costs</u> Saving money for the own car, saving a second car;</p> <p>Free usage for volunteers for trainings or meetings.</p> <p><u>Car-sharing in general</u> Special facilities as advantages of the car-sharing car, for example the Vignette . saving money through not buying one for the own car;</p> <p>Young people can have a car for going out on weekends, parents don't have to pick them up in the night;</p> <p>Car-sharing car is always maintained/serviced, tires, Vignette,...;</p> <p>Good if you need it very spontaneous;</p>

Group	Gaubitsch	Bregenz	Thüringerberg	Langenegg
				<p>In larger cities the parking situation is a problem . car-sharing as the solution;</p> <p>The size of the %ifty+ is an advantage, perfectly serving the purposes which it is used for.</p>
Disadvantages	<p><u>EV</u> Silent EV . can be dangerous (but also an advantage);</p> <p>EV: heating/cooling the car consumes a lot of energy and reduces the range of the car;</p> <p>Infrastructure of electric charging stations . exists, but often do not work, knowledge of locations;</p> <p>Due to the range of the EV it can only be used as a second car.</p> <p><u>Car-sharing in general</u> Barrier of taking somebody else's car; Number of cars (1) . should be higher, otherwise car-sharing car can only be the second car.</p> <p><u>Booking system</u> On-line booking tool sets older users apart from booking the car.</p> <p><u>Location of the car</u> The distance to the car-sharing</p>	<p><u>EV</u> EV . people have to %earn+driving it, (introduction needed);</p> <p>Range of electric car;</p> <p>Long charging time;</p> <p>Silent EV . dangerous (also for pedestrians and cyclists);</p> <p>Need to get used to/to know peculiarities of cars;</p> <p>Possible technical problems with EV.</p> <p><u>Car-sharing in general</u> New group members . fear at first about damages, a lack of trust;</p> <p>Car as status symbol . most of the people do not share cars, sharing is more likely with older cars;</p> <p>People who are sharing their own car have a higher responsibility than the other group members (service</p>	<p><u>EV</u> Disadvantages particularly in winter time (like a %modern adventure+);</p> <p>Cold in the vehicle, car is freezing in the interior on cold days;</p> <p>Range of the electric vehicle;</p> <p>Searching for a charging station as problem;</p> <p>Afraid of driving in winter on snowy roads with EV (low trust in EVs);</p> <p>Charging time is seen as a limitation, but not as a disadvantage for Car-sharing . have to arrange with it;</p> <p>Parking spaces for EVs and the charging stations are sometimes occupied, other cars (no EVs) are parking there, car can't be charged;</p> <p>Infrastructure of electric charging stations . exists, but often do not</p>	<p><u>EV</u> Range of the EV, especially in winter, not suitable for cold winters;</p> <p>EV needs briefing or training in the beginning;</p> <p>EVs: before getting the car there is no knowledge about the current battery status available . uncertainties;</p> <p>Infrastructure of charging stations . there are stations in almost every municipality, but only one quick-charging station, in Bregenz . duration of charging as a problem;</p> <p>Kind of competition for charging stations . more EVs on the road than a few years ago;</p> <p>EV . silent driving may be dangerous for children.</p> <p><u>Car-sharing in general</u> Availability of car-</p>

Group	Gaubitsch	Bregenz	Thüringerberg	Langenegg
	<p>car is important . if it is too far away . would not use it.</p>	<p>once a year, insurance...);</p> <p>Not owning a car . missing status symbol;</p> <p>Less spontaneity . first booking the car, then drive; also less spontaneity through bringing the car back in time;</p> <p>Maybe problems when damages occur, %be damage is nobody's fault-;</p> <p>Different feeling of responsibility with a car that belongs somebody else; feeling constrained to repair little damages (can also be an advantage);</p> <p>Not knowing the peculiarities of a car (opening the fuel tank cap, how to get in the reverse gear) ⇒ Operation instruction needed.</p> <p>In general: missing popularity of this car-sharing model as disadvantage. Missing willingness of people for sharing a car.</p>	<p>work, knowledge of locations is important. But: LEMnet is not up to date (wrong location of stations, does not show defective stations).</p> <p><u>Location of the car</u> Walking distance (15 min) to the car-sharing car was a problem at the beginning but they got used to it;</p> <p>Location of the car - no covered parking site (snow).</p> <p><u>Car-sharing in general</u> Flexibility is needed for spontaneous bookings (if the car is occupied . go shopping the next day);</p> <p>Need to be flexible, to arrange appointments in advance;</p> <p>Availability of the car as a disadvantage (having an important appointment and the car is not available).</p>	<p>sharing car . %ifty+is booked out quite often;</p> <p>It is unfamiliar to plan things exactly, also to come back at a certain time, planning and scheduling;</p> <p>Condition of the car: problems with cleaning or refuelling . in the beginning the initiator cared about that;</p> <p>Selling the own car and sharing another . losing a status symbol;</p> <p>Car is so often booked, that initiator often does not see it for a few weeks, can't check if it is fuelled or clean. Very frequent usage means kind of losing control over the vehicle . very important to trust each other.</p> <p><u>Location of the car</u> Parking site is not covered . snow as a problem. Even a bigger disadvantaged for the EV (loss of capacity through the cold).</p> <p><u>Hand-over of keys</u> No key-box in front of the office . can't get the key on weekends (except asking another user) for spontaneous trips, also no keys during the office\$</p>

Group	Gaubitsch	Bregenz	Thüringerberg	Langenegg
				<p>lunch break.</p> <p><u>Booking system</u> Booking via internet . one could reserve the care for a few days . not fair. This can happen for bookings via telephone . the person administrating it can clarify it on the telephone.</p>
Satisfaction and future potentials from users' points of view				
User satisfaction	<p><u>Very satisfied with:</u> Condition of the car; hand-over of keys, organisation; booking system.</p> <p><u>Less satisfied with:</u> Charging stations (location, functioning); availability (early booking necessary).</p>	<p><u>Very satisfied with:</u> Booking and reservation system; cost accounting system; costs; availability of the cars (4 cars); organisation (e.g. code for mobile phone . for automatic opening of the door in the basement garage).</p>	<p><u>Very satisfied with:</u> Booking system; costs.</p> <p><u>Less satisfied with:</u> Condition of the car (sometimes dirty inside).</p>	<p><u>Very satisfied with:</u> Booking system.</p> <p><u>Less satisfied with:</u> Condition of the car (cleanliness); hand-over of keys (only personal, no key-box).</p>
Future developments	<p><u>Booking system:</u> App coming soon;</p> <p><u>EV</u> Plug-in Hybrid for overcoming the problems with the range of EVs.</p> <p>Thinking about a second car . Twizzy (for attracting young people).</p>	<p><u>Booking system:</u> Improvements for additional bookings (developing options for offering/asking for a rideshare);</p> <p>App coming soon.</p>	<p><u>Car-sharing car:</u> Maybe acquirement of a second car (fuel).</p>	<p><u>Hand-over of keys:</u> Installing a key box with code in front of the municipality.</p> <p><u>Car-sharing car:</u> A second car-sharing car is no option, the costs (per km) would increase; they also don't want to take away public transport users.</p>
Potential users	<p>Potential user groups: women, elderly, farmers (flexible time) . analysis of times, which are less used . special offers.</p>	<p>The main users have an academic background; new users could be persons who don't have a lot of money.</p>	<p>In general more people from the municipality.</p>	<p>One 80-year-old man is selling his car because of his low pension and is interested in the fifty+ (possible future user).</p>

8 SURVEY 2 FOR CASE STUDY 9 - GRASS-ROOT COOPERATIVE SMARTPHONE-BASED CAR-SHARING

8.1 EXECUTIVE SUMMARY OF THE SURVEY

An on-line survey was carried out asking the users of two different grass-root car-sharing platforms in Austria to provide various information, one of which tend to be more used in the urban area and the other of which tend to be used more in the rural area. The survey collected 112 valid answers from the grass-root car-sharing users both in the urban and rural areas.

The result shows that the grass-root car-sharing users are typically between 25 and 55 year-old, highly educated compared to the general population typically with university degrees, and well experienced with ICT-based services. More male population are using the grass-root car-sharing than female. CARUSO, which is used more in the rural area, is used for various purposes of trips such as shopping, business, private and leisure covering rather shorter travel distance, while Carsharing 24/7, which is used more in the urban area, is more used for leisure and weekend trips covering longer travel distance. Users are typically motivated by high purchase and/or ownership cost of their own cars, practicality of car-sharing as well as limited need for car usage, and thought about the environment.

8.2 SURVEY CHARACTERISTICS

8.2.1 Survey Methodology

The purpose of this survey is to obtain information from the actual users about their motivation, usage, demographic profile, and so on. This survey was carried out as a web-based survey with a number of questions targeting the users of two grass-root cooperative car-sharing systems in Austria, namely CARUSO and Carsharing 24/7. The same questionnaire was used for the both systems users. The reason to rely solely on the on-line survey is that both of the system uses Internet booking system and thus the Internet availability is a prerequisite for the users. Indeed, as the focus group interview revealed, there are a few users in one CARUSO group that still books via telephone (municipal office puts their reservation via the Internet booking system) and such users may not have the access to the Internet or they may not regularly use it although they have the access; however, as such users are exceptional and also due to the limitation of the available resources for the survey, we did not carry out the survey in other form.

The CARUSO users were asked via each group leaders to participate in the questionnaire. This is as a result of the discussion with the service provider. Only the active group members were contacted since CARUSO has a number of inactive groups that were formed and registered but seldom share the car. Such active groups were identified by the service provider using the driving record saved on the server. 6 group leaders were contacted, including the same leaders contacted for the focus group interview. However, two group leaders do not seem to have forwarded the questionnaire to the users, and only the rest of the four seems to have forwarded it. The number of the users in the four groups together is 100 and thus we estimate that c.a. 100 CARUSO users were contacted via the four group leaders. We received 17 valid responses from them.

The distribution of the survey questionnaire to the Carsharing 24/7 users was made via its regular user newsletter. The first newsletter was delivered in mid-February 2013, and the second newsletter as a reminder mail was delivered at the end of February. Based on the idea of the provider of this car-sharing system to increase the number of participants, users who complete the questionnaire were offered to take part in a competition to win three 40 Euro petrol station voucher. The newsletters were distributed to approximately 1300 registered Carsharing 24/7 users, and approximately 500 users opened the newsletter (the newsletter has a marker to count the number of receivers who actually opened it). We received 95 valid responses from them.

The on-line survey was available from mid-February to 09 March 2013.

8.2.2 Geographical Area Covered by the Survey Research

Regarding CARUSO, as described above, we tried to distribute to six groups, while it appears that only four groups distributed the questionnaire among their members. As the four is as same as the focus group interview, the geographical covered regarding CARUSO happened to be as same as the focus-group interview (Gaubitsch, Bregenz, Thüringerberg, and Langenegg).

The users of Carsharing 24/7 are mostly in the urban areas, mainly in Vienna and Graz. Therefore the survey area is extended to urban environment in this user survey. The urban residents are overrepresented in comparison with the CARUSO-only survey, as among the respondents Carsharing 24/7 users amount to approximately 80%.

8.2.3 Respondents

Together from CARUSO users and Carsharing 24/7 users, we received 112 valid answers. Among them, 17 are from CARUSO users and 95 are from Carsharing 24/7 users.

The respondents are asked to provide the size of the municipalities they are living in. The responses are summarized in the table below. Slightly less than half of the respondents are living in rural area or small to medium-sized cities, and the rest are living in the large cities. CARUSO users are mostly in small villages while Carsharing 24/7 users are in various areas in terms of municipality size, but this is a result of the different method for questionnaire distribution.

As mentioned before, the CARUSO users who responded to the survey are the users in the groups located in Gaubitsch, Bregenz, Thüringerberg, and Langenegg. These four places are as same as the focus group interviews, and thus the background of these respondents are better referred to the focus group interview section. The number is not that large while we assume that the core users in these four active groups are those who are captured in the survey.

The respondents from Carsharing 24/7 users vary largely because the distribution of the questionnaire was done via its newsletter e-mails. About half of the respondents appear to be from large cities, which are assumed mostly to be Vienna and Graz, while the survey also captured some users in rural areas.

At large, the survey captures respondents both from rural areas and cities in a good proportion.

Table 8-1 Answer rates for web-based (CS9 survey)

Size of municipality	All	CARUSO	Carsharing 24/7
100 . 1,000	12	9	3
1,000 . 10,000	9	2	7
10,000 . 50,000	12	6	6
50,000 . 100,000	2	0	2
More than 100,000	50	0	50
No answer	27	0	27
Total	112	17	95

Other profiles of the respondents such as age, sex, education, occupation, and so on are on one hand the profile of respondents to this questionnaire while on the other hand they can be interpreted as the profile of the users of the grass-root cooperative car-sharing. Considering that the questionnaire is only distributed to those who actually uses such car-sharing or those who at least registered to such car-sharing platform, the user profiles are presented in the survey result section.

8.2.4 Solutions Considered

Demand Responsive Transport is the solution considered in this survey. As an application, grass-root cooperative car-sharing is the one considered in this survey.

8.3 RESULTS

8.3.1 Introduction

In this section, the survey results are summarised, subdivided by user profile in general, user profile related to mobility, users' experiences with ICTs, motivation, and actual usages of car-sharing. Much is designated to the user profile as one of the largest interest lies in who are actually using the grass-root cooperative car-sharing. Detailed information regarding demographic profile and mobility profile as well as experiences with ICTs such as to what extent they are used to the Internet-based services are presented and discussed. Another large interest lies in the motivation of the users to participate such grass-root car-sharing. This is analysed in the following section. Finally, as the survey asked detailed information about the last two usages, the analysis result is presented, as well as the behavioural change related to mobility that the users recognise.

8.3.2 User Profile in General

In this subsection, general user profiles such as male-female ratio, education, occupation, and so on are presented. The information in this section, followed by the user profile related to mobility, gives an overview of general characteristics of grass-root cooperative car-sharing users.

First, the ratio between male and female respondents is approximately 7:3. This is self-reported with the web-interface by the respondents. CARUSO has more female users than Carsharing 24/7. This might imply that the closed-group concept that CARUSO may attract more women than the open concept that is offered by Carsharing 24/7. 27 respondents did not give the information to this question.

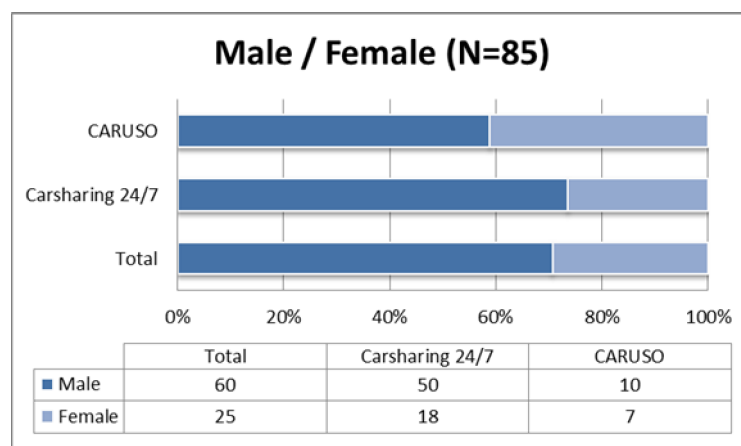


Figure 8-1 Gender ratio in web-based CS 9 Survey

The age distribution of the respondents is as shown in the table below, subdivided by the systems. The age class is self-reported by the respondents during the survey, while 28 respondents did not give the age. The result shows that most of the respondents are between 26 and 55 year-old, and the people in the thirties occupies almost one-third of the valid answers. CARUSO seems to have slightly higher age structure compared to Carsharing 24/7; however, it is difficult to confirm this due to the small number of the respondents. It might simply be because the Carsharing 24/7 respondents are rather from urban area while CARUSO respondents are from rural area (see the later part of this section).

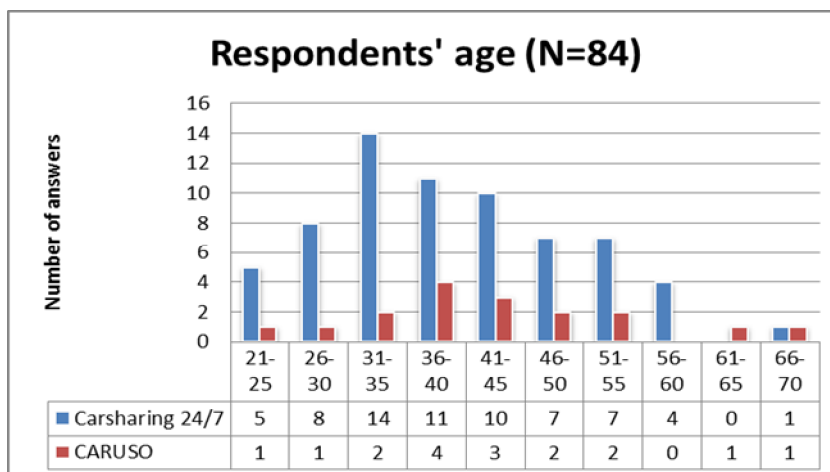


Figure 8-2 Age distribution of the respondents to the web-based CS 9 Survey

The respondents were asked their self-assessment of their housing locations. The result clearly shows that the two systems has different portfolio of their users in terms of this. CARUSO users surveyed are rather in rural areas (remote or rural) while Carsharing 24/7 users are typically in urban area (suburb or central). The result of CARUSO respondents is mostly because the survey for CARUSO users was only carried out for the four group members, three of which are in rural area. However, as mentioned before, these four groups use CARUSO most actively. Thus the result should represent the respondents residential locations.

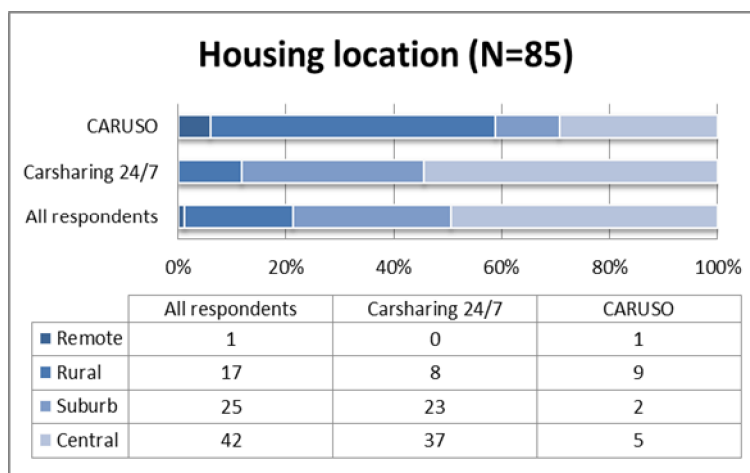


Figure 8-3 Housing location of the respondents in web-based CS9 survey based on their self assessment

Highest education is also self-reported by the respondents. More than half of the valid responses answers that they have finished university or university of applied science, followed by high-school with university entrance certification (*Matura*). 27 respondents did not give their answers to this question. Carsharing 24/7 users tend to be more educated compared to CARUSO users. This is probably related to the area where they live (see the later part in this section) that Carsharing 24/7 users surveyed are more in cities while CARUSO users surveyed are more in rural areas.

The statistics from the Austrian national statistics office is presented in figure, too. The official Austrian statistics is only available for the ages between 25 and 64-year-old; however, considering most of the respondents to this survey falls in this age group, for comparison, this is the best-comparable data. This comparison clearly shows that the grass-root cooperative car-sharing users tend to be highly-educated compared to the population in general.

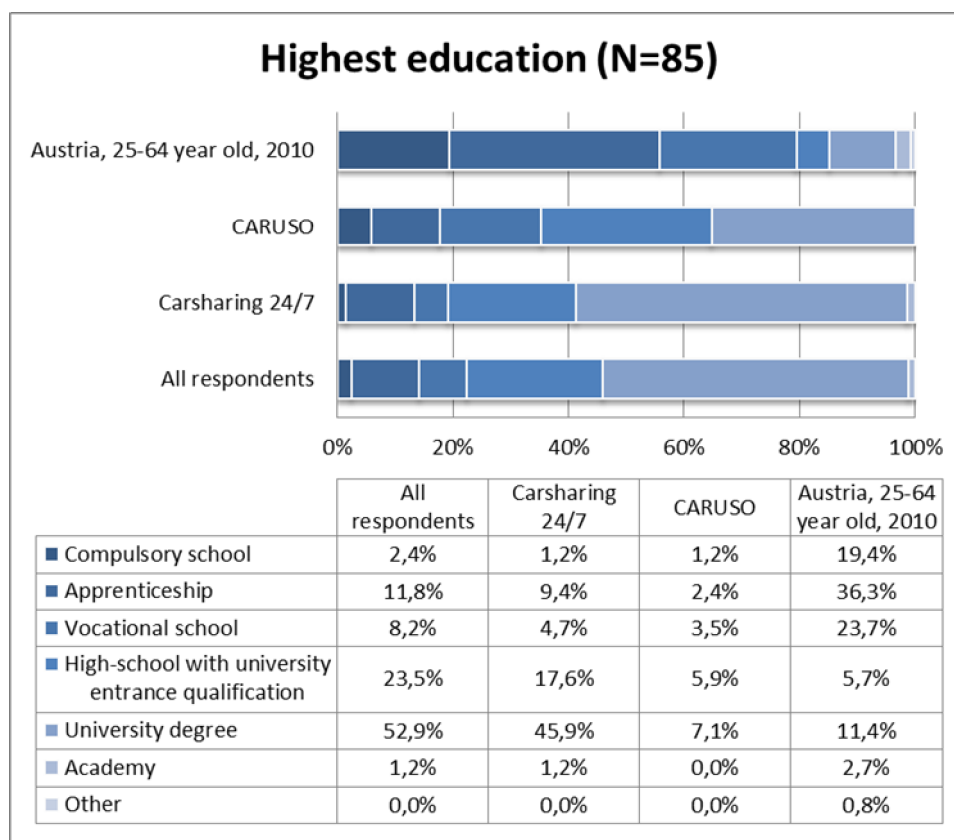


Figure 8-4 Education level in web-based CS9 survey

Source: STATISTIK Austria (2013). Bildung in Zahlen 2011/12, Page 89 and Survey for MS X

Table 8-2 Education factor in web-based (CS9 survey)

Highest education level	All Respondents	Carsharing 24/7	CARUSO
Compulsory school	2	1	1
Apprenticeship	10	8	2
Vocational school	7	4	3
High-school with university entrance qualification	20	15	5
University degree	45	39	6
Academy	1	1	0

The occupation of the respondents as self-reported is as shown in the table below. No significant difference between two systems is observed. Many car-sharing users are employed full-time. According to Austrian National Statistics Office (STATISTIK Austria), 72.5% of the Austrian residents between 15 and 64-year-old are employed, and 25.7% among them are employed as part-time worker in 2012. The unemployment is 4.3% in 2012. (STATISTIK Austria¹¹) Thus, the respondents tend to be more hired than the average, while this is understandable in that the hired people are more mobilised compared to those who are not.

¹¹ http://www.statistik.at/web_de/statistiken/arbeitsmarkt/index.html

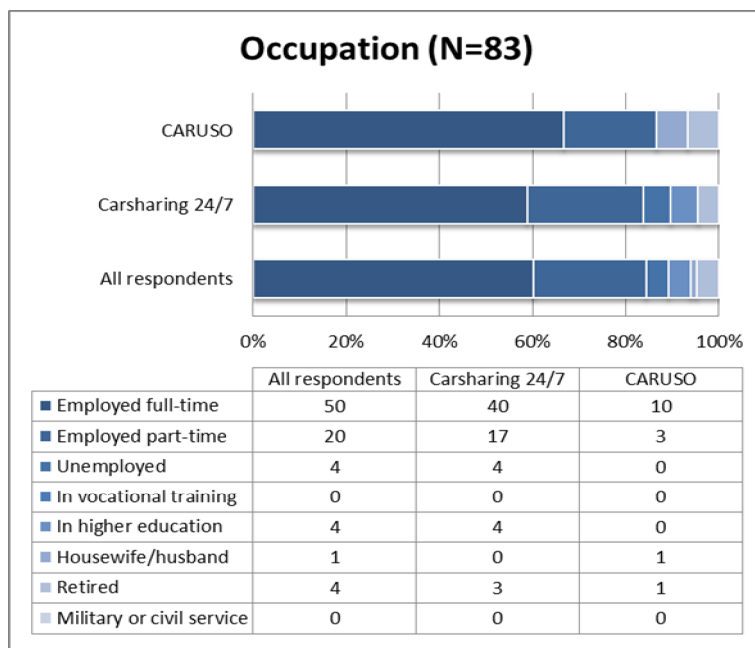


Figure 8-5 Occupation in web-based CS9 survey

8.3.3 User Profile Related to Mobility

In this subsection, the survey results related to the respondents mobility are presented, including the car ownership and public transport usage. Such information will provide an overall picture of the grass-root car-sharing users in relation to travel behaviours.

First, to the question regarding the automobile ownership, the ratio of the respondents who own their vehicle and who do not are almost one to one. 27 respondents (about one-fourth of the total respondents) did not give an answer to this question. The details are shown in the table below. Considering that the automobile ownership rate in Austria is about 530 per 1000 inhabitants in recent years according to STATISTIK Austria (521.8 in 2009, 530.3 in 2010 and 537.0 in 2011), the overall ownership rate is close to the average. More ownership of CARUSO users and less ownership of Carsharing 24/7 users can be explained with the different tendency of housing locations of the surveyed users in the two systems.

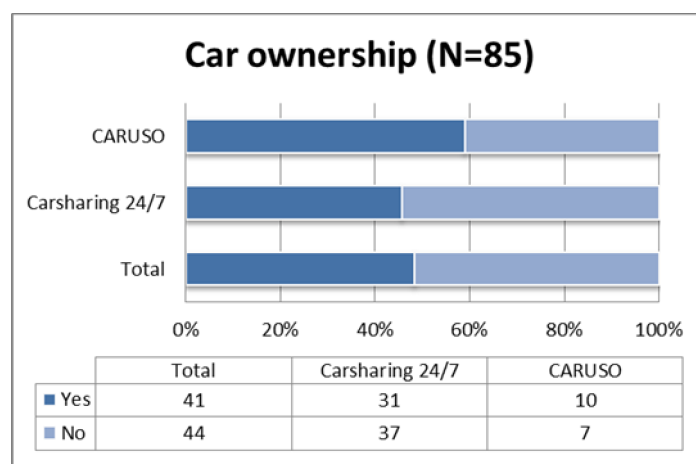


Figure 8-6 Car ownership of the respondents to web-based CS9 survey

Those who do own an automobile (41 respondents) were asked their usage frequencies and annual mileages. Self-reported results are as shown in the tables below. The profiles of the users appear to be on average regarding these aspects.

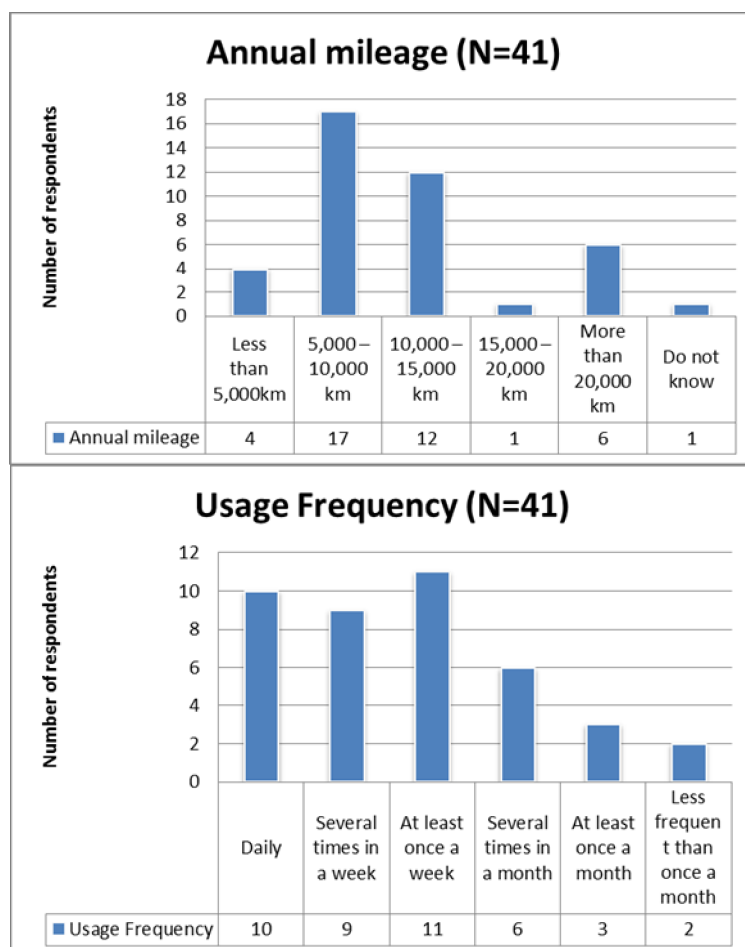


Figure 8-7 Usage frequency of cars of the respondents to web-based CS9 survey

Those who do not own an automobile (44 respondents) were asked if they have an access to a car of a family member, relatives, or friends. This question is intended to capture the non-owners' general possibility to use the cars. The result is shown in the table below. Many respondents answer that they do have some access but only sometimes.

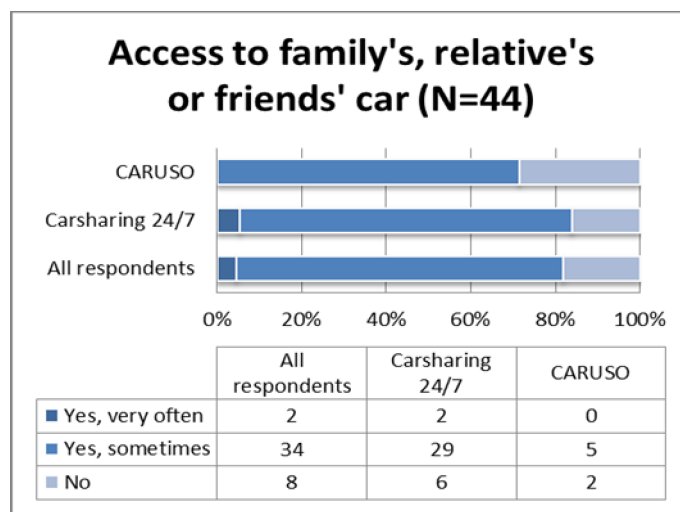


Figure 8-8 Access to other person's car reported by the respondents to web-based CS9 survey

Furthermore, for those who do not own a car and who do have an access to a car of a family member, relatives, or friends, we asked if such car is preferred or car-sharing car is preferred. The result is shown in the table below. About 70% of such respondents answer that they prefer car-sharing cars to the other cars from family member, relatives, or friends.

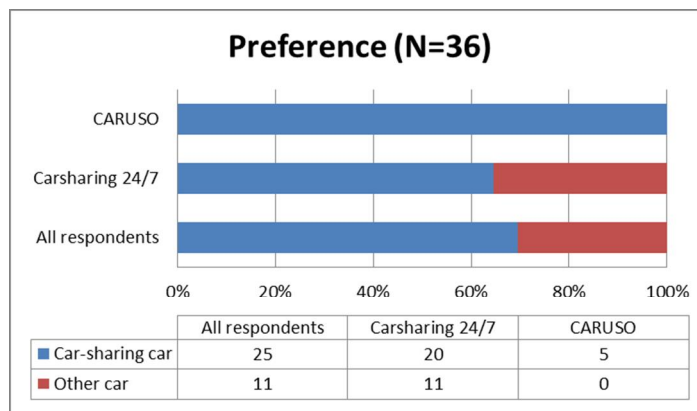


Figure 8-9 Preferences in web-based CS9 survey

The results from these two questions for non-owners of automobiles imply that a certain proportion of the users intend to replace such automobile usage with a family member's, relative's, or friend's car with the shared car. Especially, despite small number of respondents, all CARUSO users who do not own a car while have an access to another car answer the CARUSO-car is preferable to the other cars.

The public transport usage was also asked in the survey. The survey also included a question to ask if the respondent has any public transport seasonal ticket. The results are presented in the charts below

Carsharing 24/7 respondents, who tend to live in urban area, appear to be more regular public transport users. Large proportion of CARUSO users does not ride public transport that often, and this is probably because they tend to live in rural area. Similar tendency is observed with the public transport seasonal ticket that Carsharing 24/7 users tend to own more and CARUSO users less.

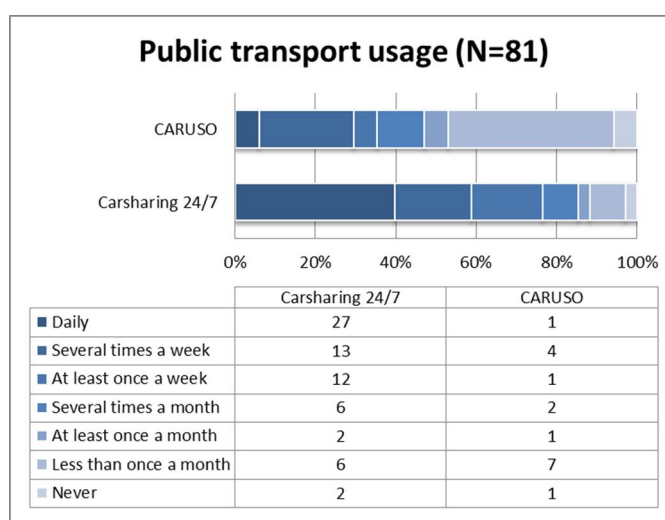


Figure 8-10 Use of public transport usage reported by the respondents to web-based CS9 survey

Carsharing 24/7 users tend to own a public transport seasonal ticket more while CARUSO users tend to own none. This corresponds to the different living area that more urban residents are registered as

Carsharing 24/7 users while more rural area residents are in CARUSO groups. 27 respondents did not give an answer to this question.

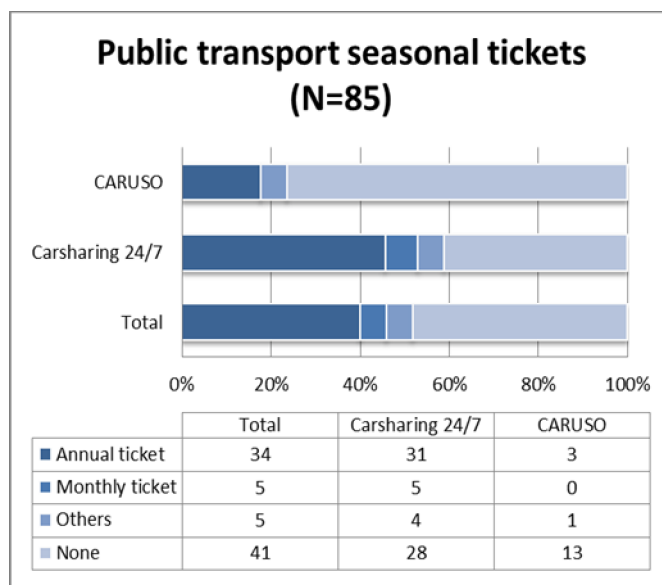


Figure 8-11 Possession of public transport seasonal ticket by respondents to web-based CS9 survey

8.3.4 User's Experiences with ICT Applications

The survey result shows that the car-sharing user tend to recognise themselves as fairly experienced with the Internet services in general such as Internet banking, on-line shopping, and hotel booking. To the question asking such experiences, most of the respondents answered **very experienced** or **experienced**. The questionnaire also provided choices **less experienced** and **no experienced**, but no respondents chose these answers. This clearly shows that most of the users of the grass-root car-sharing at the moment use other Internet-based services quite often. 27 respondents did not give an answer to this question.

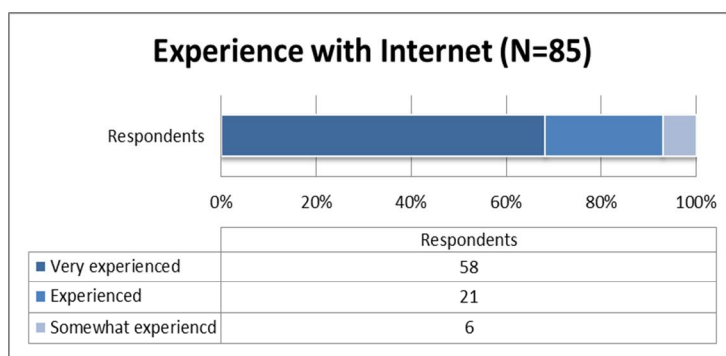


Figure 8-12. Self-assessment of the experiences with the Internet by the respondents to web-based CS9 survey

In addition to this general experiences with Internet-based services, the respondents were asked the frequently-used on-line travel planner. The following table shows the result (multiple choice was allowed). It is clear that most of the respondents use some travel planner available on-line regularly.

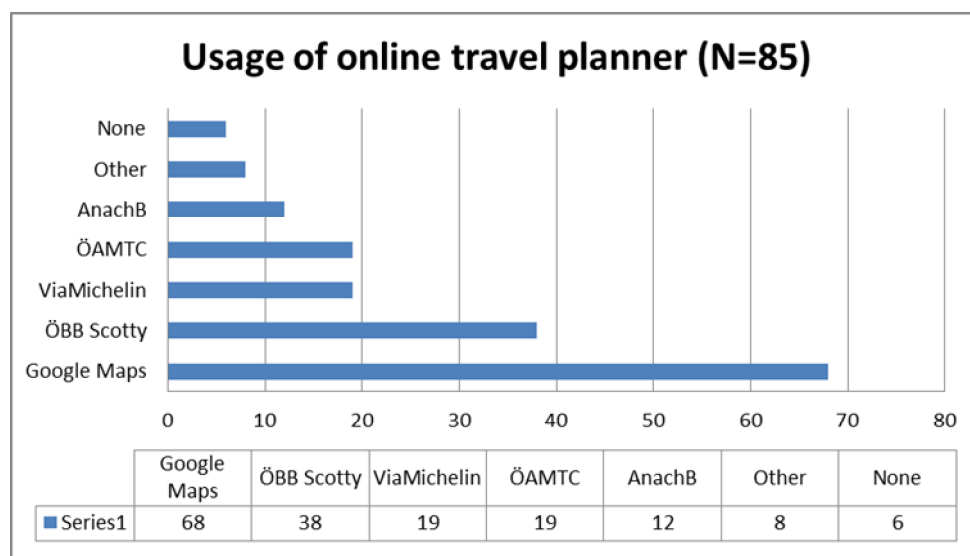


Figure 8-13 Use of on-line travel planner as per responses in web-based CS9 survey

Table 8-3 List of major travel planners covering the survey region (CS9 survey)

On-line travel planner	Note
Google Maps	Multimodal travel planner mainly used for road-based private modes
ÖBB Scotty	Travel planner for train and public transport
ViaMichelin	Route planner for road-based private modes
ÖAMTC	Route planner for road-based private modes
ANachB.at	Multimodal travel planner
Other	-
None	-

The respondents were also asked the availability of some Internet-enabled devices, namely smartphones, tablet PCs and desktop or laptop computers. Most of the respondents have a laptop or desktop personal computer and also four-thirds have a smartphone. The tablet-pc has not yet been penetrated into the users at the moment. This result shows that the respondents have at least one and likely two or more Internet-enabled devices.

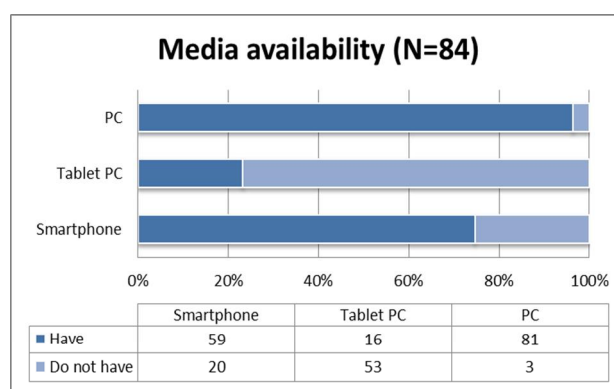


Figure 8-14 Digital media availability of the respondents to web-based CS9 survey

The respondents were also asked how they usually book the car-sharing. It is clear that most of the users book via laptop or desktop computers. Smartphone booking is only possible for Carsharing 24/7 users as it provides smartphone apps for iOS and Android. At the time of the survey, CARUSO did not provide any smartphone app and development had been just started. It has to be noted that, because

of this, the survey did not include the answering option %smartphone+ for the one designated to CARUSO users.

It is interesting that some users still make the reservation via telephone, while they appear to be the case that the members of very small groups (e.g. 2 members) calls when they want to use the groupsq cars to make an agreement before the reservation is made into the reservation system or the organizer provides an opportunity to book via telephone (see the focus-group interview for the details).

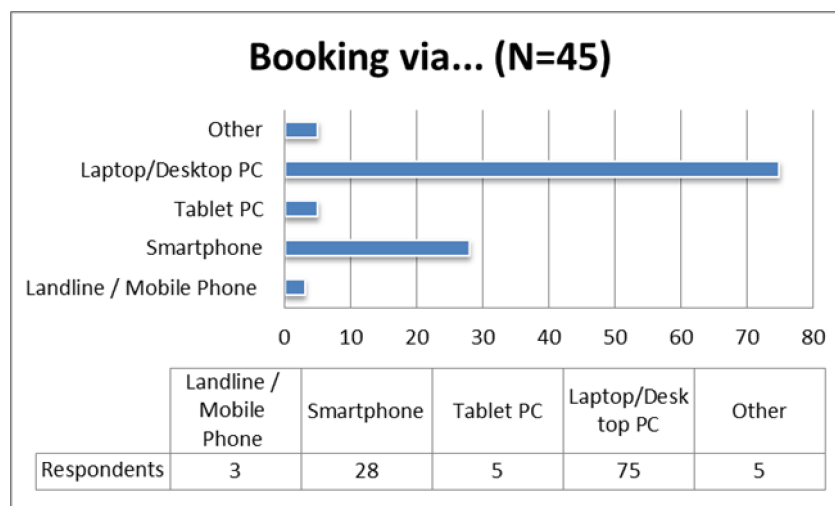


Figure 8-15 Electronic equipment use for booking purposes as per responses in web-based CS9 survey

8.3.5 Motivation to Start Car-Sharing

The respondents were asked the motivation to start the car-sharing. The results are shown in the figure below. The respondents were asked if they total agree, agree, somewhat agree, or do not agree to the statement to indicate their motivations.

Among the answers, following six points are agreed much among the users of CARUSO and Carsharing 24/7:

- Because it is an innovative form of mobility.
- Sharing a car is more functional than owning one.
- Environmental thoughts were an important factor.
- I need a car only occasionally.
- A car's insurance, fuel and maintenance costs of a private car are too expensive.
- An own car is too expensive.

The following statements received some agreement and disagreement.

- Because it is a great system for sharing a car within the family.
- The type of car was essential for me (e.g. EV, van, etc.).
- Friends of mine are doing car-sharing too.

The proportion for each statement is shown in the following figures.

The motivation related to cost of the cars is much higher among the Carsharing 24/7 respondents. The Carsharing 24/7 appears to attract more car owners who want to offer his/her car as a car-sharing car to reduce the overall cost compared to CARUSO, because Carsharing 24/7 focuses on car owners and potential users much more individually rather than focusing a group to share a car while CARUSO's assumption is that the users form a group first.

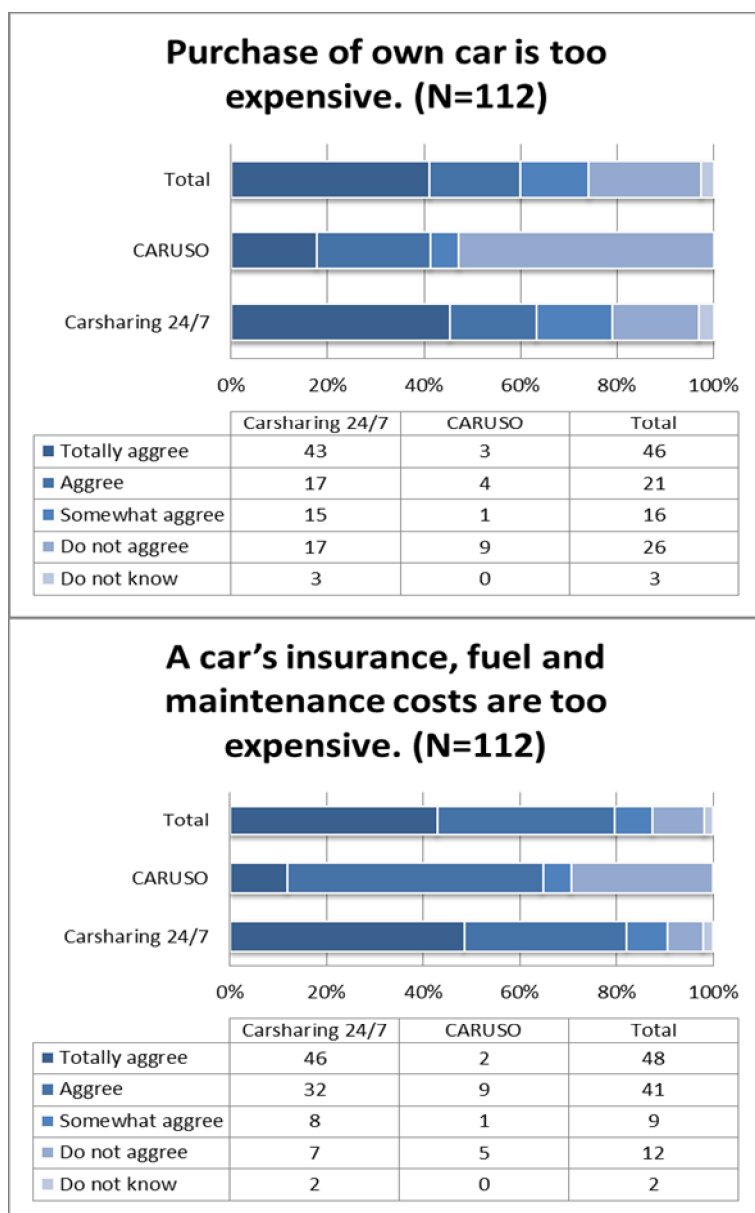


Figure 8-16 Reasons for using car-sharing schemes as per responses in web-based CS9 survey

The occasional needs for car seems to be an important motivation to participate in grass-root car-sharing, too. This is somewhat classical argument related to car-sharing, while the result confirms to some extent that the occasional need for the car in the city serves as a valid motivation for the car-sharing users. The Carsharing 24/7 users has much stronger motivation related to this than CARUSO users. This can be explained by the different housing locations of the respondents from the two systems that there are more urban residents among the surveyed Carsharing 24/7 users.

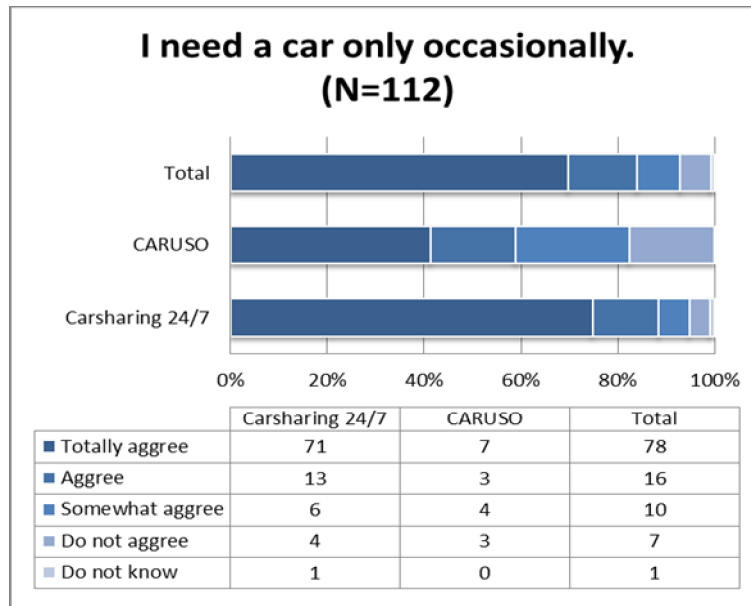


Figure 8-17 Reasons for using car-sharing schemes as per responses in web-based CS9 survey

Much attention for special type of a car is paid by CARUSO users. This is clearly because some CARUSO groups provide electric vehicles and another does a van that can carry a large amount of luggages. CARUSO can choose the vehicle according to the needs of the initial members so that the people with interests of a certain type of vehicle can gather to form a group. On the contrary, Carsharing 24/7 assumes that users already own cars to put the car-sharing market and thus special type is not particularly considered.

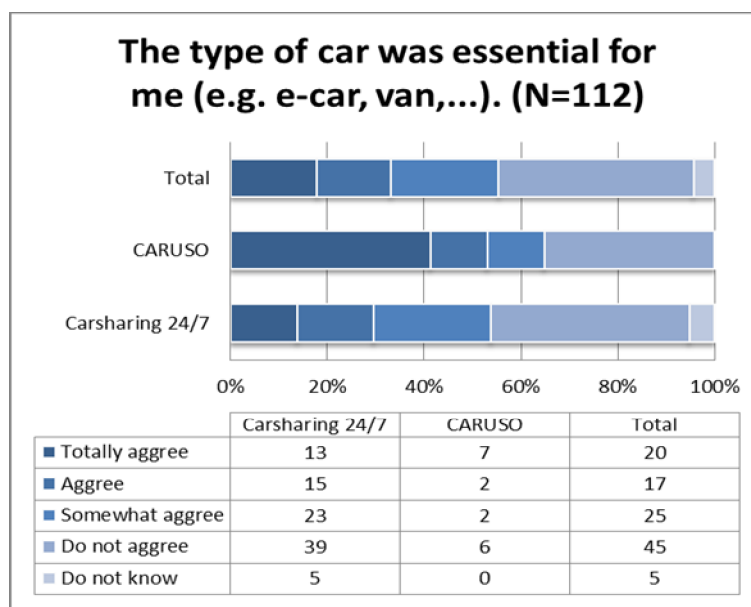
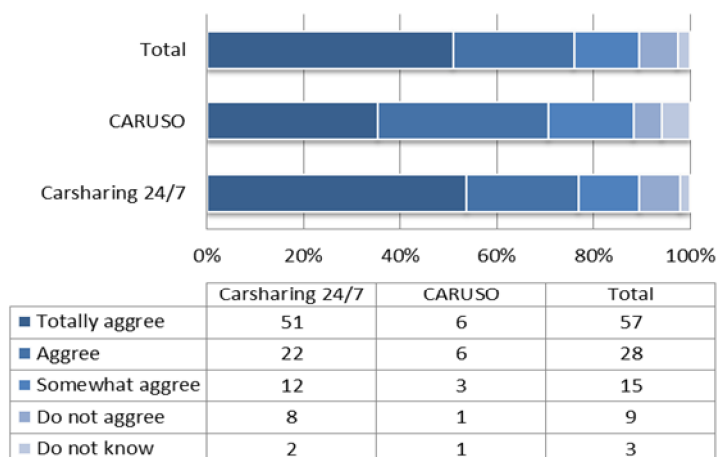


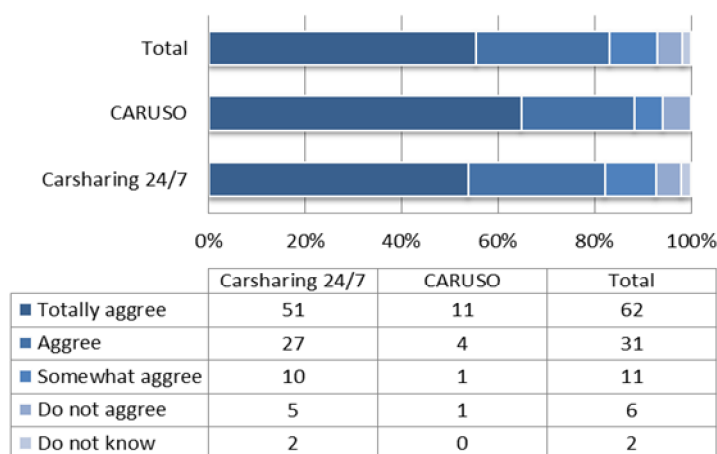
Figure 8-18. User preferences regarding car type as per responses in web-based CS9 survey

Friends participation to the car-sharing systems appears to be also an important motivation. This is especially clear with CARUSO users that are assumed to have more potential to be scouted as group members compared to Carsharing 24/7 which does not offer the group concept.

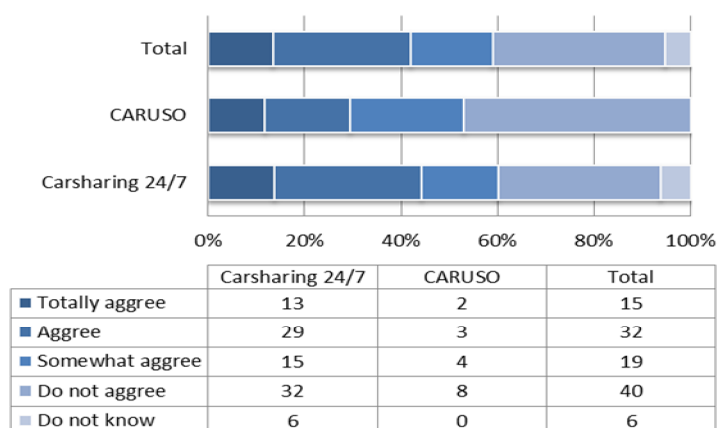
Sharing a car is more functional than owning one. (N=112)



Because it is an innovative form of mobility. (N=112)



Because it is a great system for sharing a car within the family. (N=112)



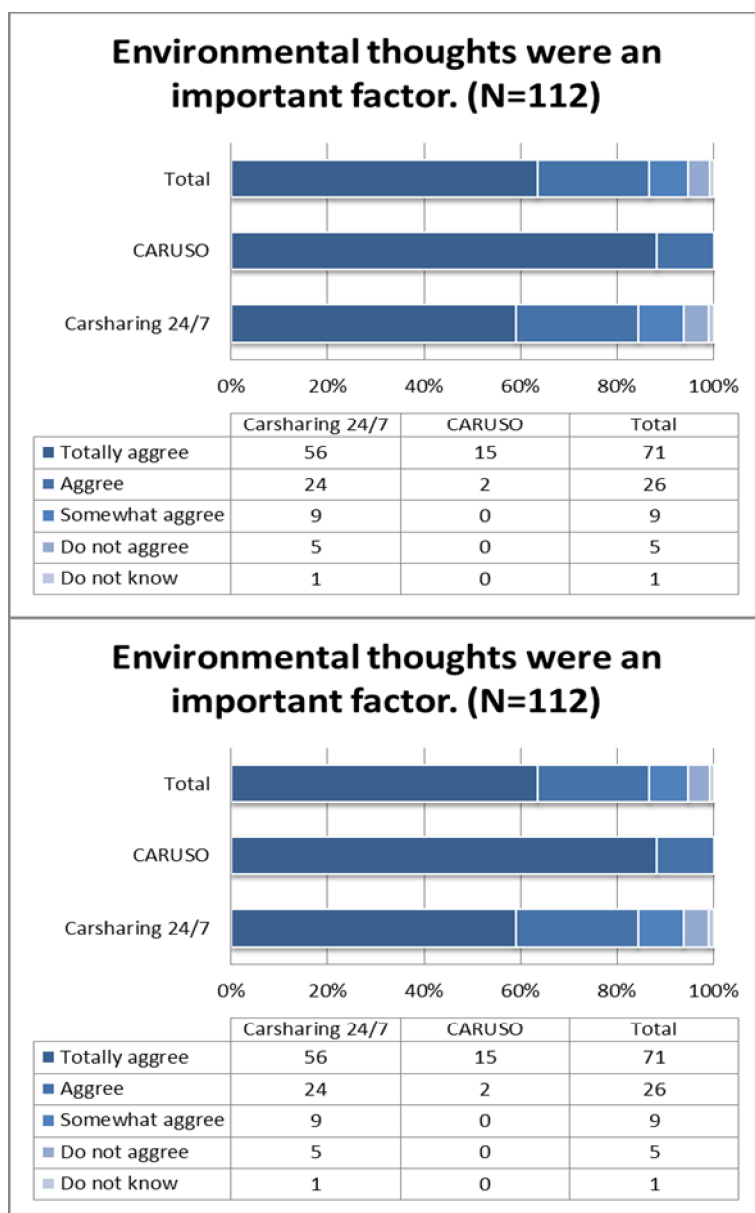


Figure 8-19 Reasons for using car-sharing schemes as per responses in web-based CS9 survey

The respondents were asked to provide their before-after information about their private vehicles. In total, about one-fourth of the users own their car to share with other members. Among non-owners, about half were those who are assumed to start using the car with car-sharing while the others are either those who use the car-sharing car as a second car or those who changed from owning a car to car-sharing.

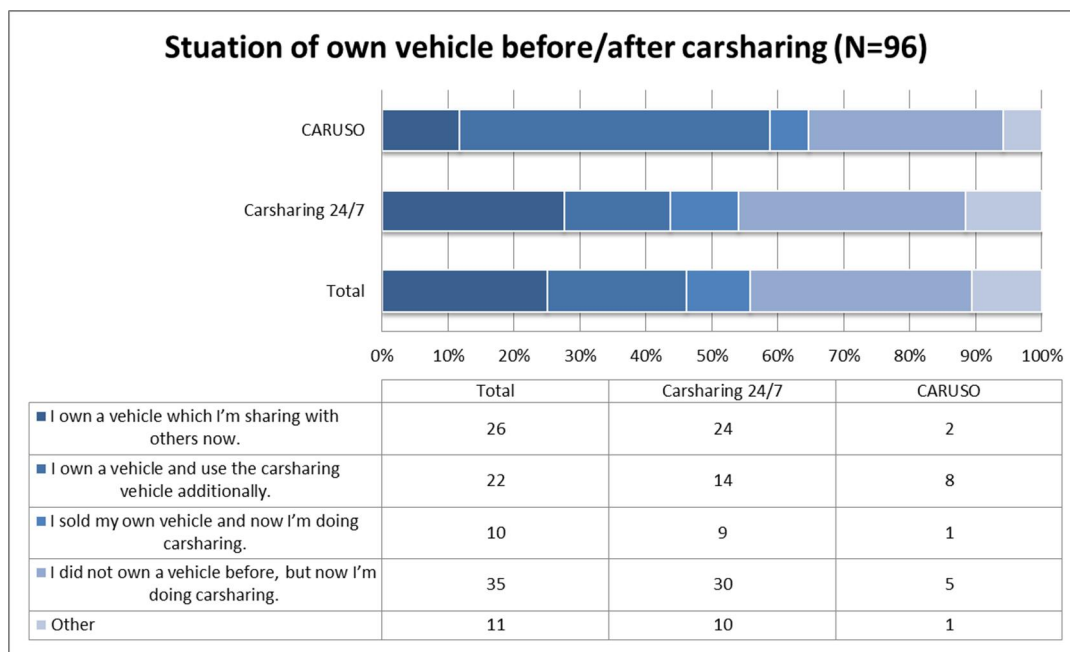


Figure 8-20 Changes to respondents' own vehicles after starting car-sharing as reported in web-based CS9 survey

This result being interpreted in relation to the motivation to start the car-sharing, in total, about one-fourth of the respondents appear to want to offer their cars to car-sharing groups, while the others appear to want to use someone else's car. The ratio of those who offer their own cars to car-sharing is much higher among the Carsharing 24/7 users, while it is lower among CARUSO users. The high percentage of this among the Carsharing 24/7 users, together with the fact that about one-third answers that they use car-sharing car while they do not own a car, implies that there is a good matching of demand and supply in terms of such car-sharing in the urban area.

The percentage of those who owns their own cars and uses car-sharing cars additionally to them confirms that many CARUSO users use the car-sharing vehicle to substitute the second car.

8.3.6 Usages of Car-Sharing Cars

In the framework of the on-line survey, a mini travel survey was carried out. The respondents were asked to recall the last two usages of the CARUSO/Carsharing 24/7 cars to provide the basic trip information such as trip purpose, travel distance, time of the day, and so on. In this section, the result is presented from this mini travel survey. All the results presented here are separated for CARUSO and Carsharing 24/7 platforms so that the comparison between two different types of grass-root car sharing platforms can be made.

The self-reported trip purpose are as shown in the following figure. CARUSO's usage is almost equally splitted to important daily trip purposes including leisure, business, private and shopping. The leisure trips together with weekend trip (up to three days) has a large share for Carsharing 24/7 almost reaching to the half of the usage.

There are much leisure-related trips undertaken with Carsharing 24/7 while other trip purpose related to daily needs are proportionally less carried out with Carsharing 24/7. Considering that much users of Carsharing 24/7 are in urban area or suburbs and much of them indicate that they use public transport regularly, the grass-root car-sharing cars are typically used on a weekend for leisure purpose while daily travel needs such as commuting and shopping tend to be fulfilled with public transport.

On the contrary, CARUSO users undertake more business, shopping, and private trips, although a certain trips were made for leisure. This implies that CARUSO is more used to fulfill the daily travel needs. This is understandable when the fact is considered that the surveyed CARUSO users are much in remote or rural area where automobiles tend to be more needed to fulfill the trip purposes

that tend to be more routine and that CARUSO enables easy booking for shorter time period that enables the users to book it for such purposes.

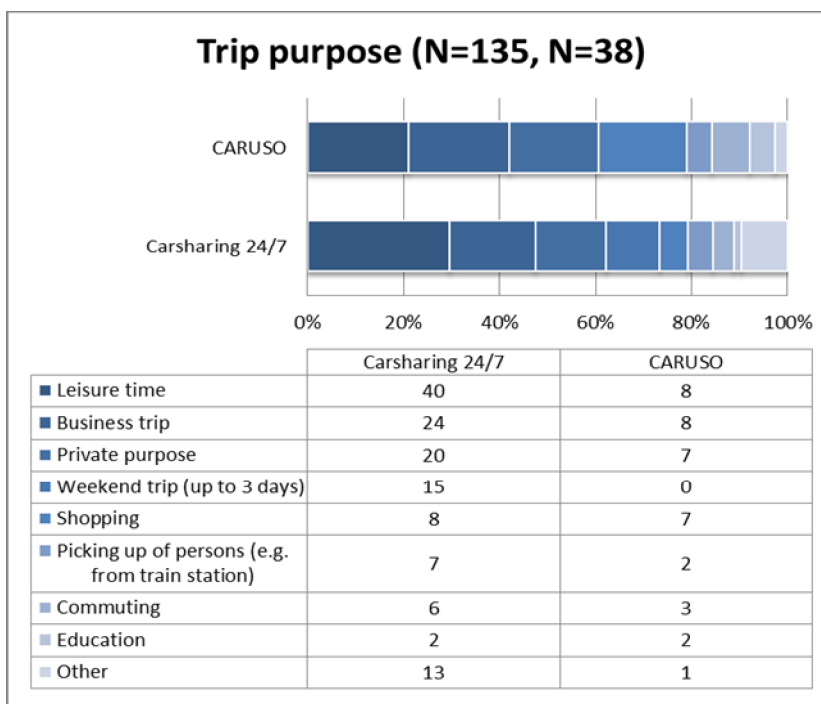


Figure 8-21 Distribution of trip purposes with shared cars as reported in web-based CS9 survey

The travel distance was also asked in the survey. The results are presented in the following figures with cumulative percentages. The travel distance indicated here is from the start of the one usage to the end of the usage such as a distance covered by a round trip.

Carsharing 24/7 users tend to drive much longer than CARUSO users and about half of the trips are over 50km. This is probably corresponding to the high share of leisure and weekend trips undertaken by Carsharing 24/7 users.

CARUSO users tend to drive less and they appear to use it for the distance covering daily needs such as to nearby towns. Another potential reason is that the CARUSO has much electric vehicles shared with it, which reduces the driving distance due to EV's shorter driving range. Furthermore, as the survey was carried out in February and early March and the result is from just two last usages, it is likely that the reported trips are mostly carried out in winter, when the driving range of the electric vehicles becomes shorter due to the low temperature.

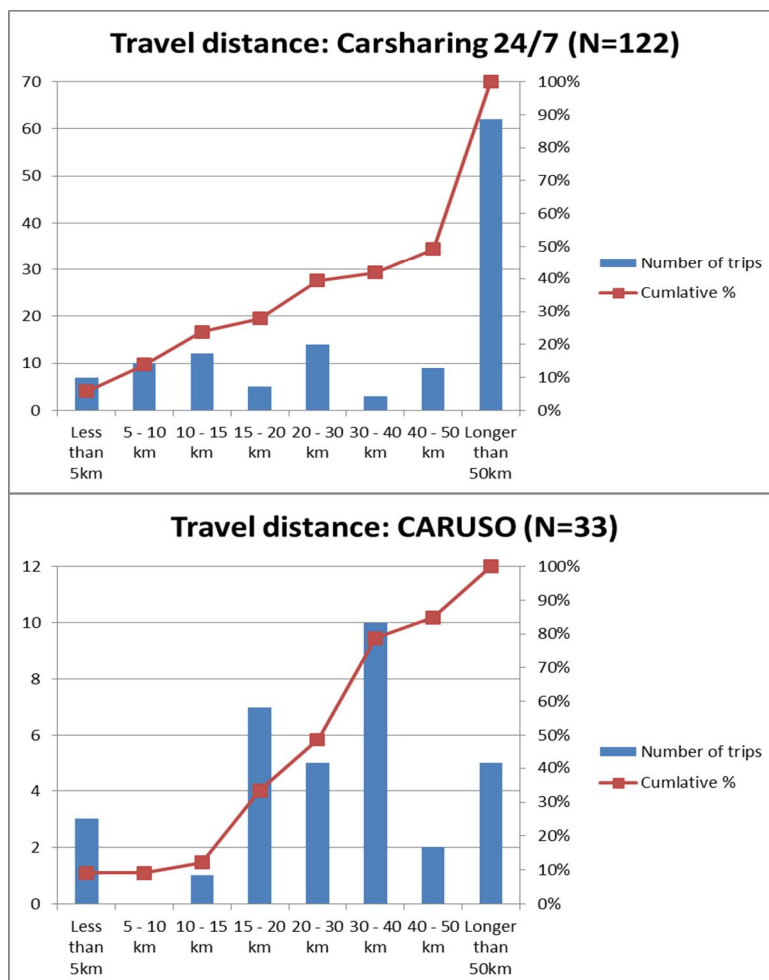


Figure 8-22 Distribution of travel distances covered with car-sharing cars as reported in web-based CS9 survey

The respondents were asked to indicate if the trip was made on a weekday or in a weekend. As the result in the following figure show, number of the trips in the weekends is high. The result is in line with the trip purpose that the percentage of leisure and short weekend trip trips is approximately one third of all the trips. This result confirms that the Carsharing 24/7 users undertake more leisure and weekend trips.

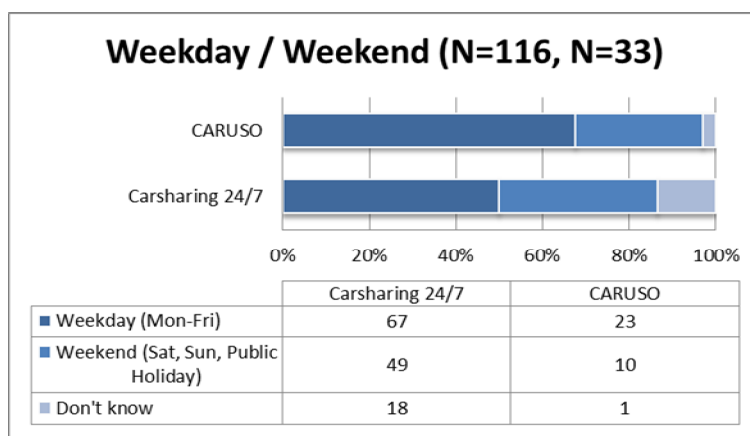


Figure 8-23 Distribution between weekday and weekend as reported in web-based CS9 survey

Time of the day is also reported from the last two usages. Trips made with Carsharing 24/7 tend to be carried out more in the afternoon and evening compared to CARUSO.

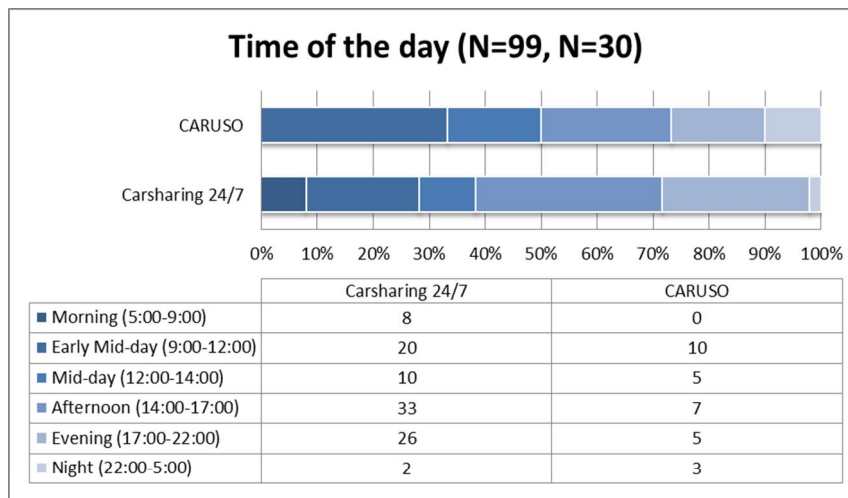


Figure 8-24. Distribution of hours as reported in web-based CS9 survey

Car occupancy was also asked in the survey. Many trips were made as single-occupancy trip or trip with a driver and another passenger on board.

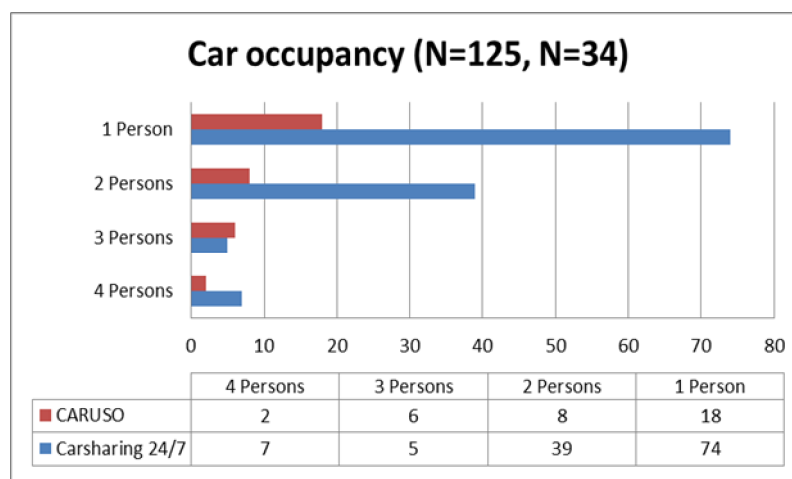


Figure 8-25 Car occupancy rates in car-sharing as reported in web-based CS9 survey

The luggage carried during the trip was also asked in the survey. Approximately half of the trips made with the grass-root car-sharing systems were with a luggage heavier than 5kg.

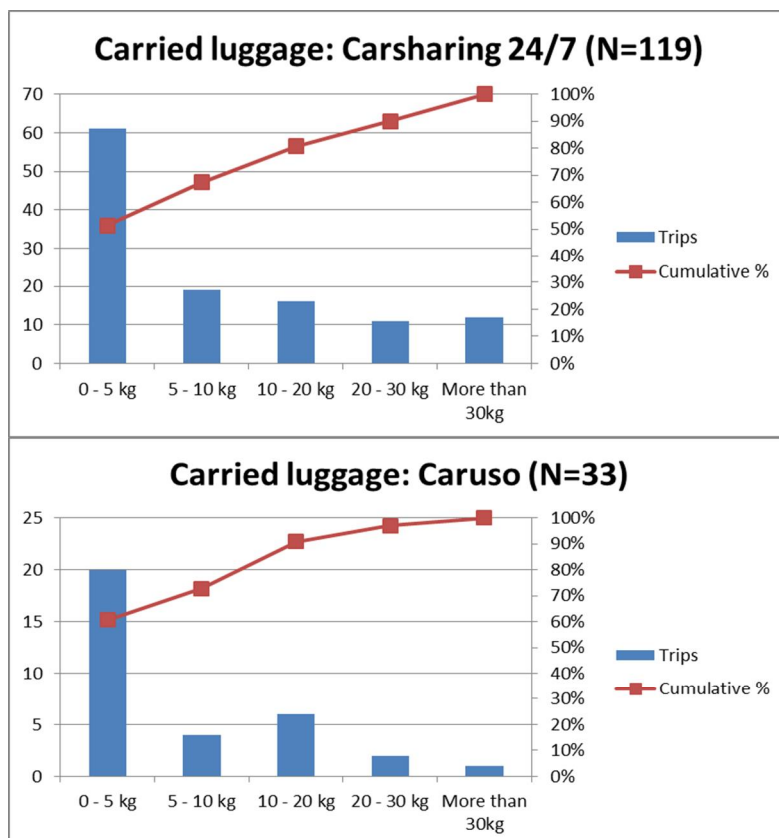


Figure 8-26 Carried luggage in car-sharing as per reported in web-based CS9 survey

In the survey, respondents were asked if they had experienced non-availability of car-sharing cars when they want to use them. The CARUSO users tend to experience much and they tend to choose their own cars or to take a car as a passenger, while many Carsharing 24/7 respondents have not experienced such situation so far. This appears to be in line with the different typical trip purposes that the CARUSO users tend to use more to fulfil everyday needs while Carsharing 24/7 is used much for leisure purposes.

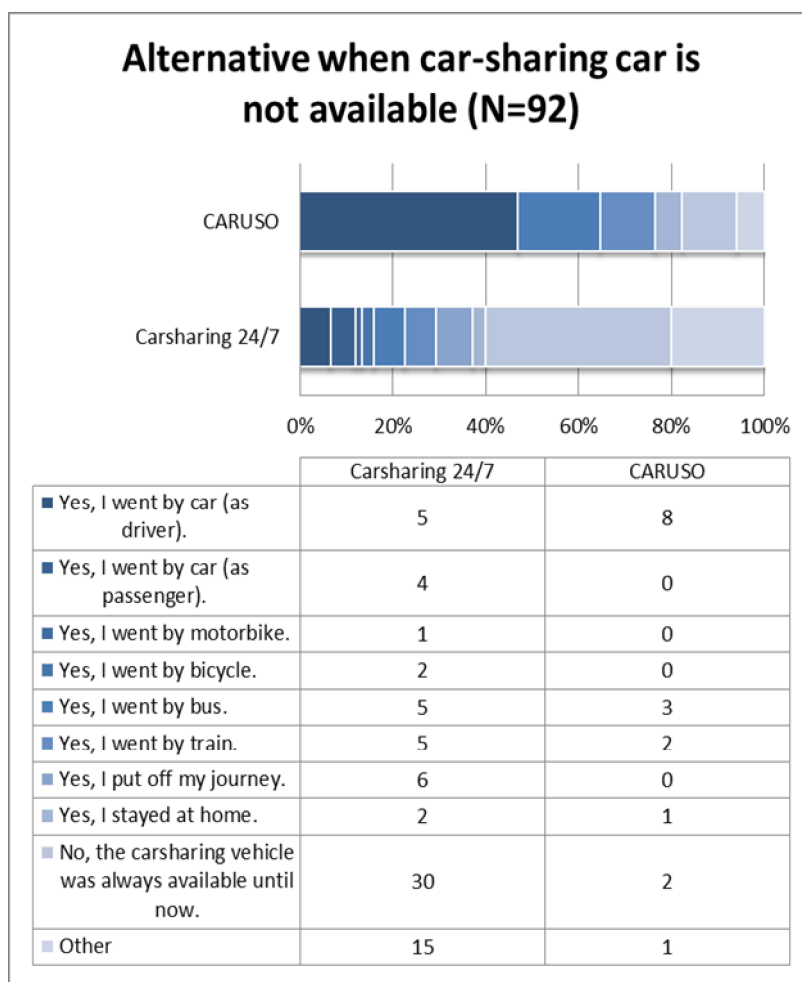


Figure 8-27 Alternatives when car-sharing car is not available as responded in web-based CS9 survey

8.3.7 Change in Travel Behaviour

The changes of travel behavior and related perception were asked in the survey. There are many points asked, while one of the most significant result is that much attention is paid to the choice of transport mode according to the purpose, as well as less single-purpose trip appears to undertaken by the car-sharing users. It also appears that car-sharing brings increased car occupancy to some users. Certain proportion of the users feel that they are more flexible and/or socially connected and they also feel they have better access to services. Some users report that they spend more for mobility than before. Usage of public transport as well as combination of a car and public transport are reported to increase after the respondents started car-sharing.

What seems most important, however, is that a certain proportion of the respondents report that they drive cars less than before. Meanwhile, some reports they drive more than before. This difference probably comes from the owner who puts his/her car to car-sharing and the non-owner who just joins car-sharing. From this result, car-usage at large does not appear to decrease through car-sharing as the decrease by some uses (probably mainly by the car owners) appear to be compensated by the increase by other users (probably mainly by the non-owners); however, regarding this point, further in-depth research is needed with another method because the result does not tell any quantitative information about the actual increase and decrease.

Grass-root car-sharing, at large, seems to influence positively to the users' travel behavior especially in that it improves their consciousness to the appropriate transport mode according to the trip purpose, it influences the users to make less single-purpose trips, make more combination of cars and other

modes as well as more public transport usage and less car driving, although they may be to some extent compensated by increased usage of cars by some users and by some other aspects.

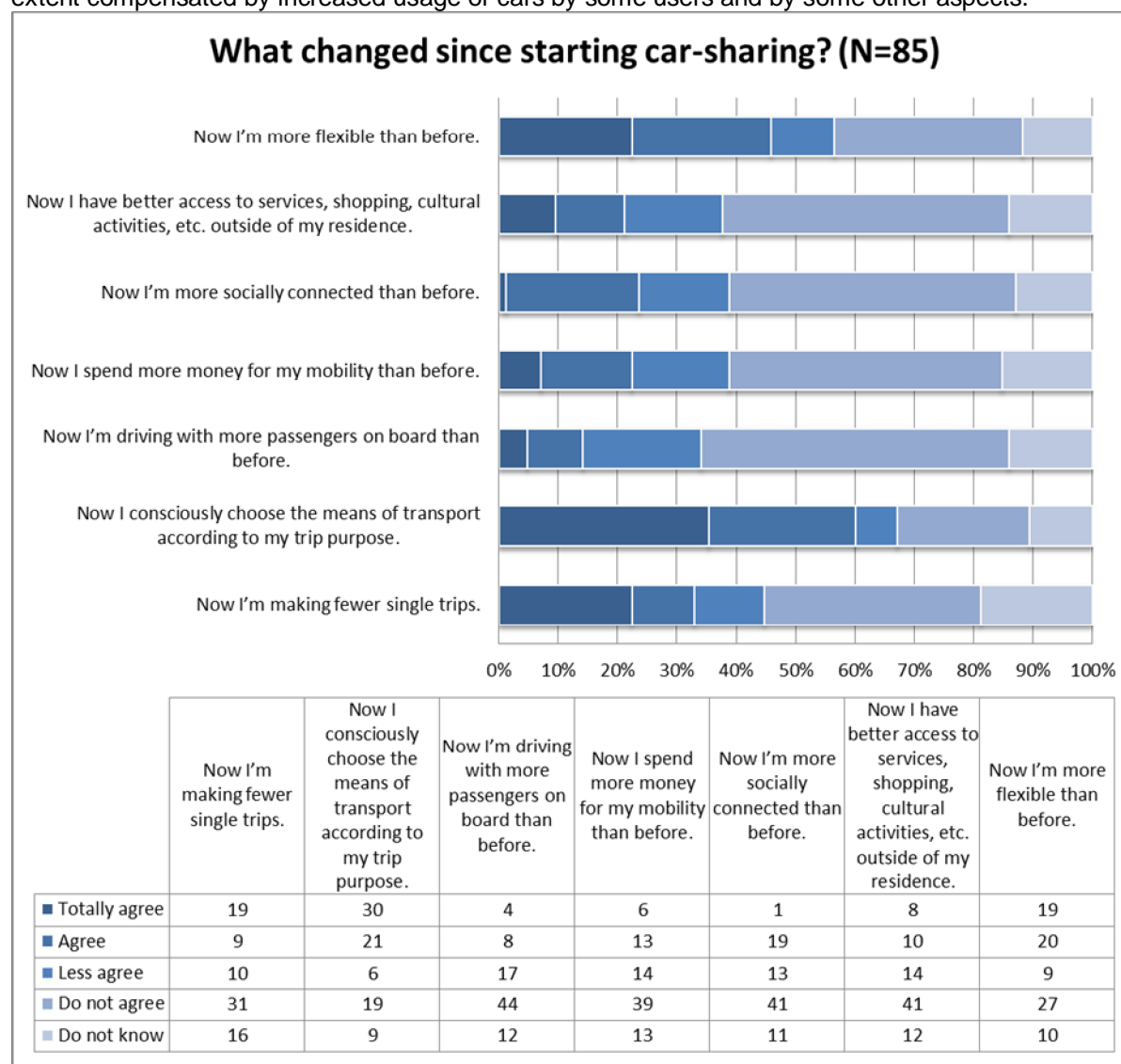


Figure 28 Respondents' self-assessment about the changes since starting car-sharing as reported in web-based CS9 survey

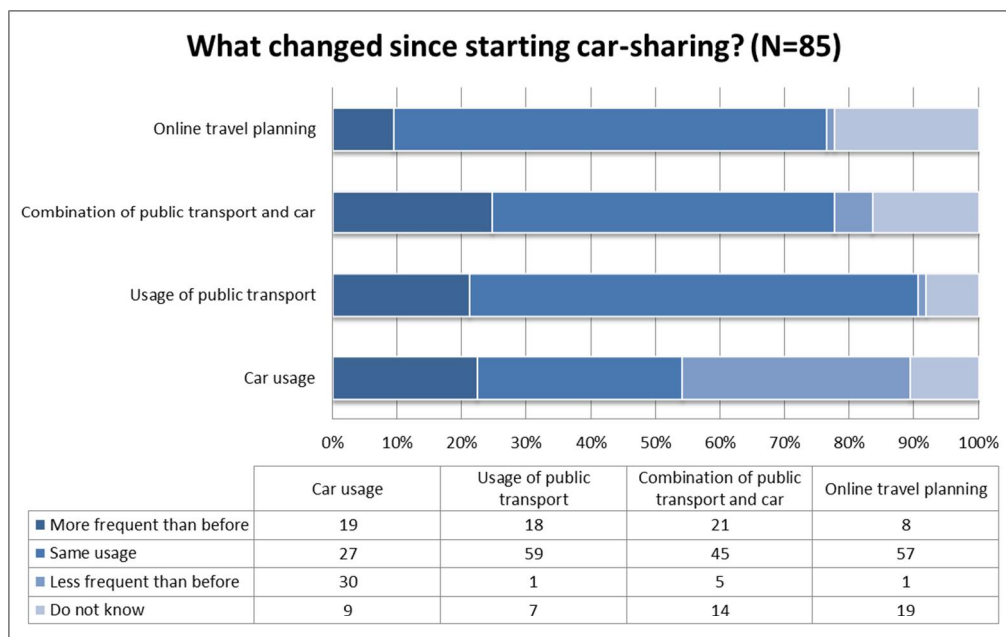


Figure 29 Respondents' self-assessment about changes since starting car-sharing schemes as per responses in web-based CS9 survey

9 SURVEY 3 FOR CASE STUDY 9 - GRASS-ROOT COOPERATIVE SMARTPHONE-BASED CAR-SHARING

9.1 EXECUTIVE SUMMARY OF THE SURVEY

For analysing the publicity and experience with car-sharing offers in rural areas in Austria a telephone survey was conducted from February to April 2013. The focus was on 14 municipalities in the western (Federal State of Vorarlberg) and eastern part (Federal State of Burgenland and Lower Austria) of Austria. All of the surveyed municipalities are either middle-sized or small cities serving as regional centres or small town/village with a few thousand inhabitants. Car-sharing offers only exist in a few of these municipalities.

The telephone survey comprised 1030 calls from which 194 respondents participated at least partially. In spite of the small number of respondents the key questions were answered providing interesting results. In spite of a high publicity of the car-sharing term, nobody has ever tried such an offer.

9.2 SURVEY CHARACTERISTICS

9.2.1 Survey Methodology

The purpose of this survey is to obtain the information both from users and non-users in small cities and rural areas regarding the following points;

- Percentage of population who knows or have heard about car-sharing (market penetration).
- Actual experience with car-sharing if the respondents have.
- Interest and willingness to use if the respondents have not yet used it.
- Reasons not to use car-sharing in general.

The reason to focus on small cities and rural areas is as follows:

- Differently from large cities such as Vienna where car-sharing services are offered and used for long time, in such small cities and rural area car-sharing is rarely offered or almost non-existent. No information about the market penetration or potential of car-sharing has been provided as of yet to the best of our knowledge.
- Grass-root private car-sharing has, as the CARUSO example demonstrates, much potential not only in large cities but also in smaller cities and in the rural area. Thus, collecting the information from such area regarding the aforementioned points can serve as a basis for the assessment of the future potential of such ICT-based grass-root car-sharing.

The survey was carried out as a telephone survey from the middle of February until the middle of April 2013. The number to be called was chosen randomly from a phone directory that is available on-line. The directory used in this survey contains a number of the private land lines and some mobile phones whose numbers the users choose to publish in it. To increase the response rate, the survey was mostly carried out on weekdays approximately between 17:30 and 20:00, when people in such rural areas or in small cities in Austria tend to be at home.

One of the most important key survey strategy is that the respondents are asked at the beginning of the questionnaire if they know car-sharing or not, and if not, a brief explanation is given to explain what car-sharing is so that some of the respondents can recall the concept although they forget the term car-sharing.

9.2.2 Geographical Area Covered by the Survey Research

The survey was carried out in the four municipalities in the Austrian Federal State of Vorarlberg, which is located in the westernmost part of Austria, and ten municipalities in Burgenland and Lower Austria (*Niederösterreich*), both of which are located in the eastern part of Austria closed to Vienna. The following table shows the list of the municipalities where the telephone survey was carried out, including the population and the number of calls we made, as well as the number of valid responses:

Table 9-1 Characteristics of telephone based CS9 survey

Federal State	Municipality	Population (>15 year-old)*	Number of Calls	Respondents'	Valid Answers	Note
Vorarlberg	Bregenz	23,620	90	21	:	CARUSO is used
	Dornbirn	38,601	108	29	22	Close to Bregenz
	Hohenems	12,619	95	27	22	Close to Bregenz
	Feldkirch	26,158	96	30	27	Close to Thüringerberg
Burgenland	Neusiedl am See	6,024	108	24	22	
	Eisenstadt	11,351	108	34	24	Rural centre
	Mattersburg	6,054	32	7	6	
Lower Austria	Laa an der Thaya	5,361	40	10	7	Close to Gaubitsch
	Mistelbach	9,516	42	10	9	Close to Gaubitsch
	Krems an der Donau	21,155	45	15	11	
	Tulln an der Donau	13,048	29	8	6	
	St. Pölten	44,642	103	24	18	
	Baden	21,779	50	10	8	
	Wiener Neustadt	35,253	50	11	8	

*Population is derived from Austrian Statistical Office (*STATISTIK Austria*). : no valid answers

The municipalities in Vorarlberg are in the geographic areas where the CARUSO cooperative car-sharing system is rather intensively used. The municipalities in the eastern part are not necessarily located in such area, while the profiles of the municipalities resembles to the ones where CARUSO system is used in terms of geographical location and/or population. All of the surveyed municipalities are either middle-sized or small cities serving as regional centres or small town/village with a few thousand inhabitants.

The four municipalities in Vorarlberg are all located along the corridor along a valley and all of them are close to the border with Swiss or Lichtenstein. The municipalities in the eastern part are mostly within 80km or within one hour by driving from Vienna while they are rural cities/towns and they are also close the borders with Czech Republic, Slovakia, or Hungary.

Conventional car-sharing is offered in some of these cities/towns. Bregenz, Dornbirn and Feldkirch have two or three car-sharing stations in each, and St. Pölten, Baden, and Wiener Neustadt have one station each in front of the main railway stations. No other cities/towns in the table offer car-sharing at the time of the survey.

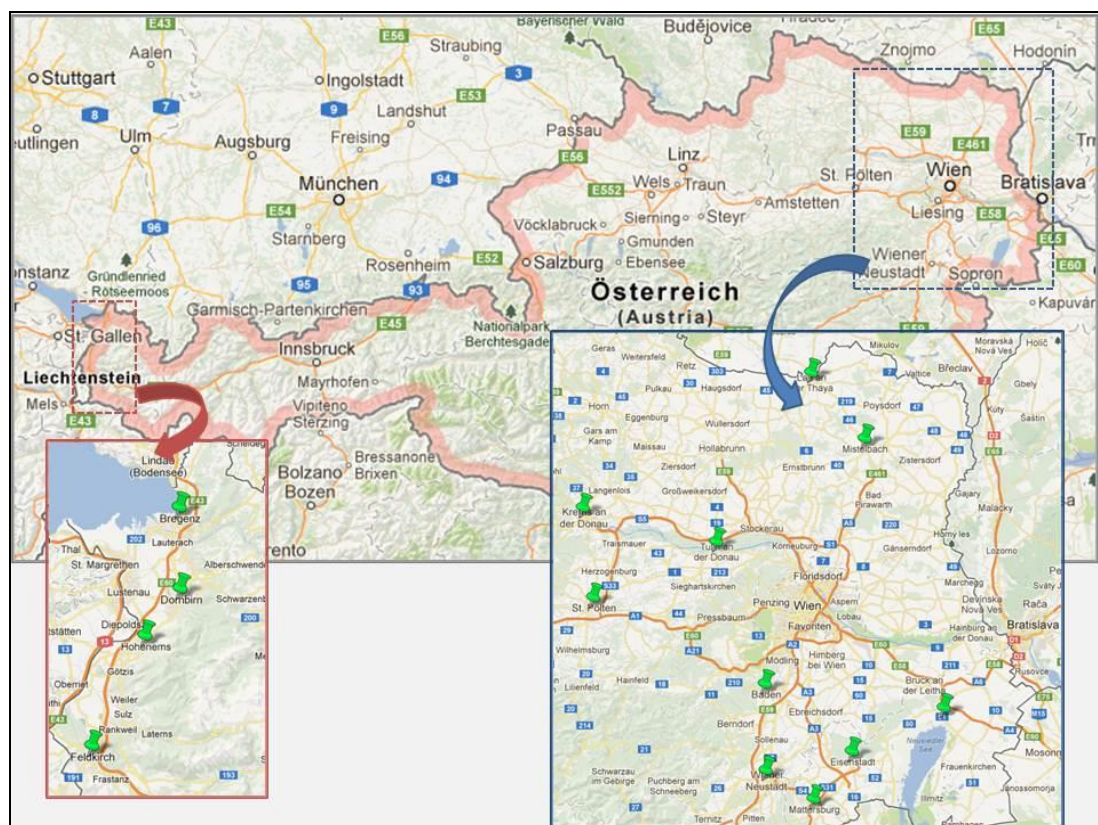


Figure 9-1 Area coverage of the telephone based CS9 survey

Source: Google maps with own presentation

9.2.3 Respondents

General information:

During the survey, 1030 calls were made, and 194 respondents (18.8%) participated at least partially. The number of the respondents who aborted their answering during the call is fairly large and only 15 respondents completed the whole survey. Nevertheless, this does not mean the survey result is useless because most of the respondents answered the key questions that were placed at the beginning of the questionnaire.

Gender of the respondents:

The ratio between male and female respondents is quite balanced while slightly more women than men participated. 54% women and 46% men were responding the telephone survey. This result reflects general findings that women are more likely to participate in surveys than men.

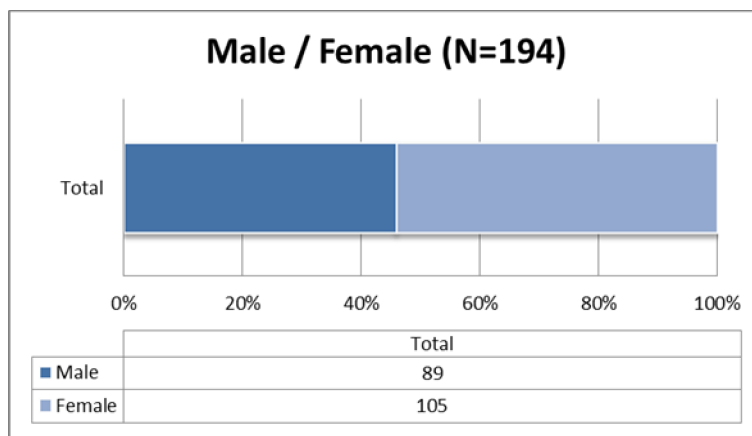


Figure 9-2 Gender ratio in the telephone based CS9 survey

Age of the respondents:

Regarding the respondents' age 27% of the respondents are young and middle-aged persons from 18 to 40 year-old. The majority of the respondents (59%) are between 41 and 65 year-old. 14% of the respondents are over 66 year-old.

The smaller number of young people participating in the telephone survey can be explained with the directory used for the survey which contains more private landlines than mobile phone numbers. A lot of young people do not use landlines anymore and only own a mobile phone. Another explanation for the high number of elderly people can be the fact that older people are more willing to participate in a survey in general.

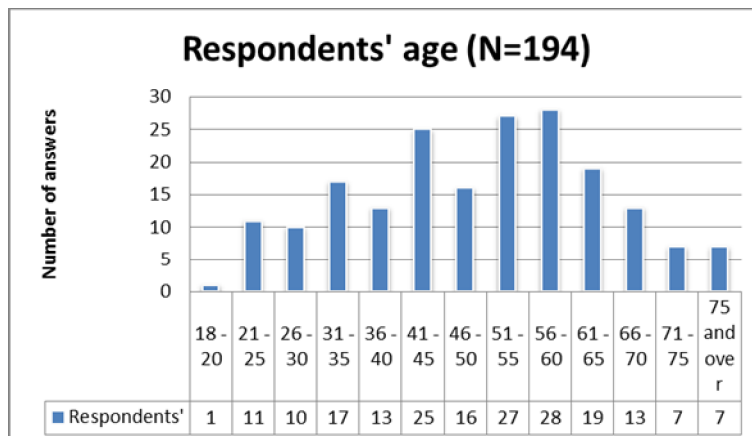


Figure 9-3 Respondents' age distribution in the telephone based CS9 survey

Highest education of the respondents:

In comparison to the Austrian population between 25 and 64 year-old compulsory school as the highest education of the respondents is below the Austrian average (4.7% vs. 19.4%) and the same applies to apprenticeship as the highest education (11.5% vs. 36.4%). The number of respondents with vocational school as highest education reflects roughly the number in the Austrian population (18.2% vs. 23.7%). Remarkably high are the numbers of the respondents that graduated in a high-school with university entrance qualification (30.7% vs. 5.7%) and the number of the respondents with a university degree (30.7% vs. 11.4%).

Therefore the respondents have a significant higher education than the average Austrian population between 25 and 64 years.

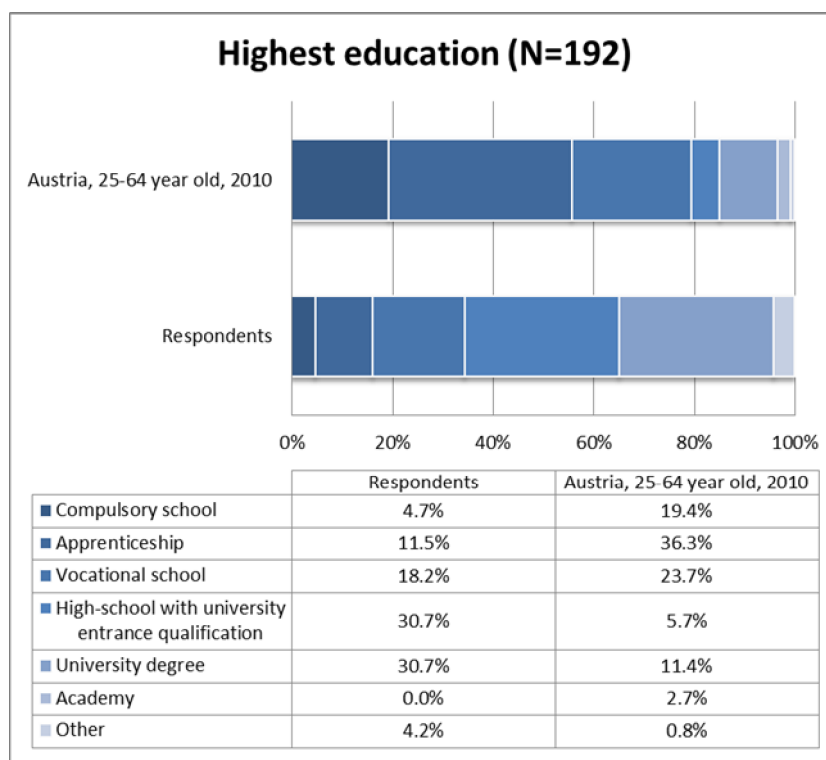


Figure 9-4. Highest education of the respondents to the telephone based CS9 survey

Occupation of the respondents:

Regarding the occupation of the respondents 44% are employed full-time and 14% are employed part-time. This ratio is in line with the Austrian average. Only 4% of the respondents are currently unemployed, 2% are in vocational training and 3% are in higher education. 8% of the respondents are housewives or . husbands and 25% are retired.

Thus almost 60% of the respondents are currently employed and retired people are overrepresented.

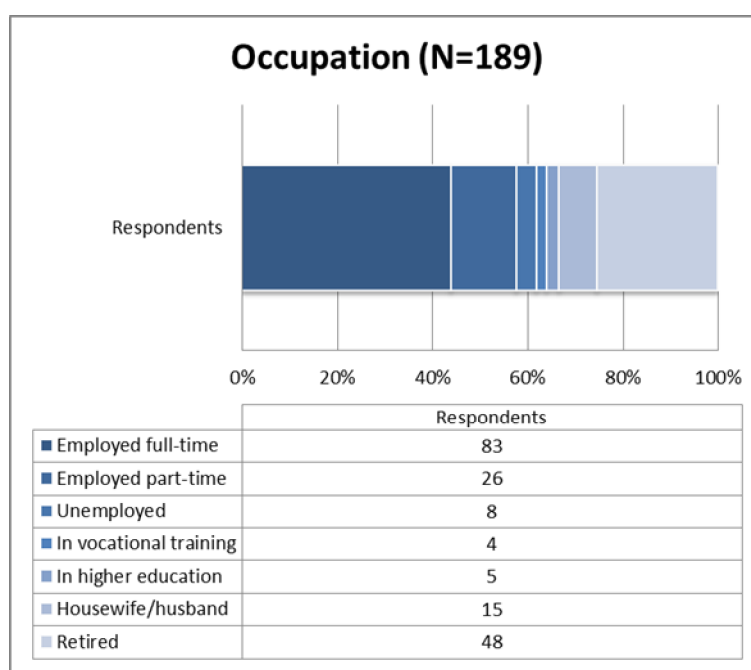


Figure 9-5 Occupation of the respondents to the telephone based CS9 survey

Public transport usage of the respondents:

In general it can be stated that 35% of the respondents are using the public transport once or several times a week or even daily. Almost 33% of the respondents are using public transport several times or at least once a month, while 24% are using it less than once a month. 8% of the respondents never use public transport.

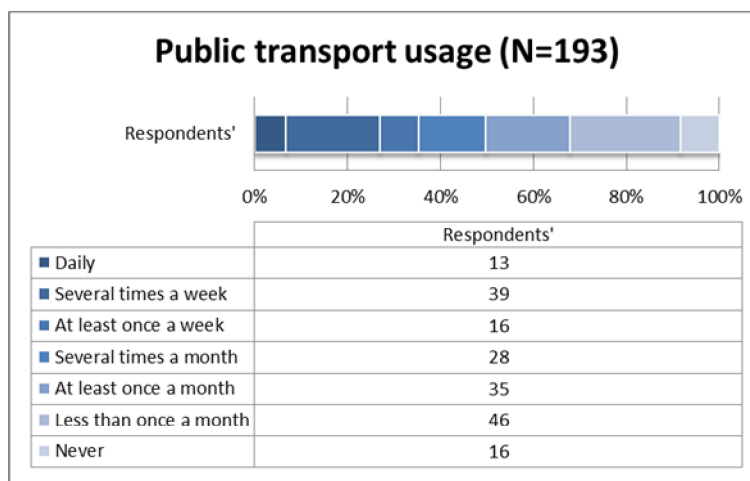


Figure 9-6 Public transport use among respondents to the telephone based CS9 survey

This sample size is not representative due to the small number of respondents but it allows a rough overview for small to middle-sized municipalities. The results do not allow an in-depth analysis.

9.2.4 Solutions Considered

Demand Responsive Transport is the solution considered in this survey. As an application, grass-root cooperative car-sharing is the one considered in this survey.

9.3 RESULTS

9.3.1 Publicity of the Term Car-Sharing

One key result of this telephone survey is the fact that almost 74% of the respondents are familiar with the term car-sharing. 26% of the respondents have never heard about the term before. This result is in line with other reports that the term car-sharing is already established, not only in urban areas. The high number of people that are aware of the concept of car-sharing is also remarkable regarding to the high number of elderly respondents.

The fact that the respondents have an over-the-average education is probably associated with the high publicity of the term car-sharing.

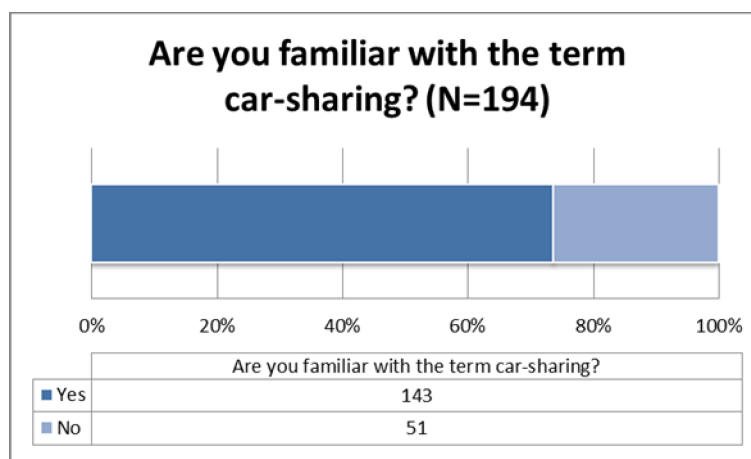


Figure 9-7 Respondents' familiarity with car-sharing as per results of the telephone based CS9 survey

9.3.2 Usage of a Car-Sharing Offer

No single person among the 74% of the respondents who are familiar with the term car-sharing has ever used a car-sharing offer yet. Although there are a lot of questions in the telephone survey concerning the actual experience with car-sharing the survey result deliver no information about this. This result also is in line with other studies showing that car-sharing is popular indeed, but in most of the cases the people have not tried this offer yet.

The reasons for not using a car-sharing offer so far are quite considerable: for 75% of the respondents there is no car-sharing offer available near their residence. In light of the high publicity of the term car-sharing the result implies that car-sharing could attract more users if there were more car-sharing offers in small cities and rural areas.

The second important reason for not using a car-sharing offer is for 42% the car ownership. This reflects the fact that people in rural areas are more likely to have an own car than people living in urban areas with a good public transport network.

The usage of public transport is for 13% of the respondents a reason for not using a car-sharing offer and the lack of flexibility with a car-sharing car is a reason for 9% of the respondents.

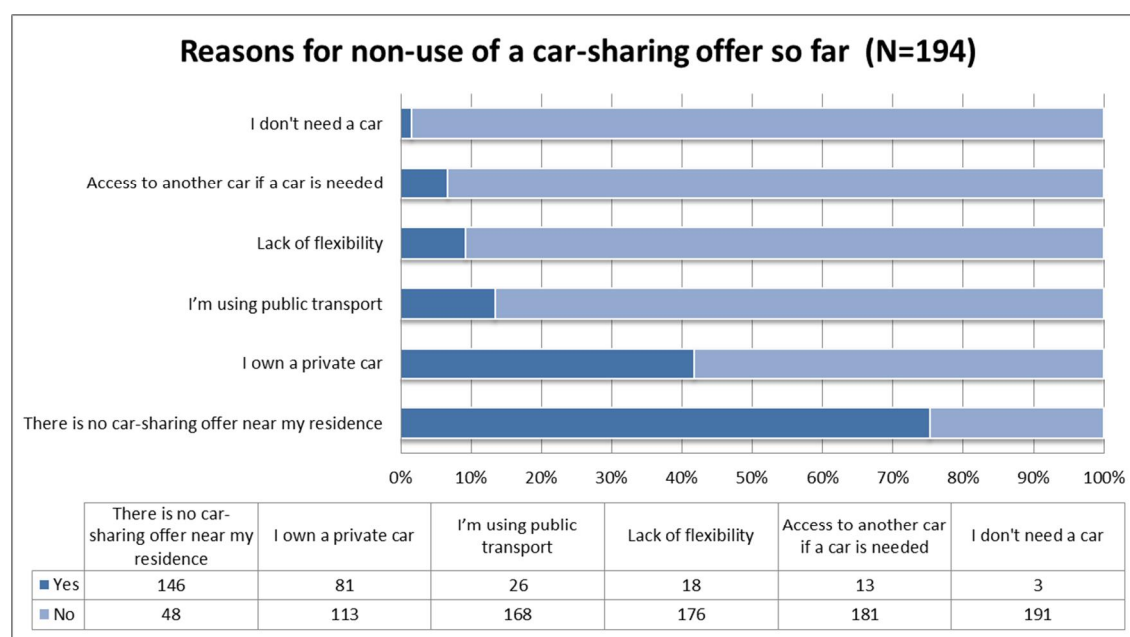


Figure 9-8 Reasons of non-use of car-sharing as per results of the telephone based CS9 survey

9.3.3 Respondents' Experiences with ICT

In the telephone survey the media availability of the respondents was another important issue. 92% of the respondents have a laptop or a desktop PC which is higher than the average Austrian figure where (81.3%). 8% of the respondents do not have any of these devices which can be explained by the percentage of people over 71 year-old at 7%.

Due to the fact that the majority of the respondents (59%) are between 41 and 65 year-old and the percentage of people between 18 and 40 years is only 27%, the number of respondents owning a smartphone is high with 50.5%. In comparison in Austria 44% are using mobile phones or smartphones for using the mobile Internet.

At least 26% of the respondents own a tablet PC, which is also a high number compared to people in Austria where almost 9% are using a tablet PC.

Thus the respondents have very high media availability. With regard to ICT-based grass-root car-sharing such as CARUSO the investigated areas have future potential for such forms of car-sharing.

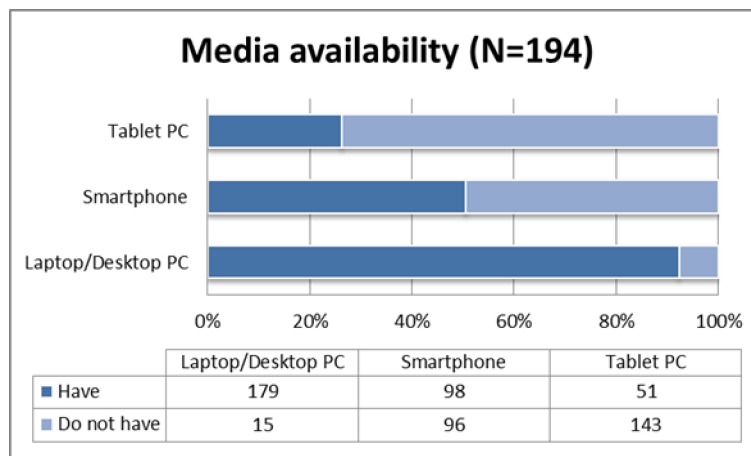


Figure 9-9 Digital equipment availability as per results of the telephone based CS9 survey

10 CONCLUSIONS

The survey approach provided useful information allowing for development of the related case studies. The variety of methods used (qualitative and quantitative analysis) gave a full picture of the users' (and potential users') attitudes towards selected ICTs. In some locations one survey was sufficient (e.g. London which is well researched in terms of transport features and here the survey was directed specifically at one group of users – people with disabilities), while in rural areas, which are not so well researched with regard to transport, more than one survey was necessary (i.e. future of public transport in warminsko-mazurskie or car-sharing in Austria). Most of the surveys dealt with real ICT solutions in place – in this case they provided answers to why people use/do not use them and how they could be improved. One of the surveys dealt with the potential for ICT introduction (warminsko-mazurskie case) – in that case it provided answers to the transferability of ICTs into a rural context, their possible acceptance and barriers preventing their full utilisation.

In section 2, the results of the on-line survey on the usefulness and value of **smartphone apps to provide travel assistance to disabled people** with a physical mobility impairment, carried out in the UK during spring 2013, are presented. From the results, the following conclusions can be derived as the main points.

Almost two thirds of the sample (65%) reported that their mobility fluctuated from day to day, and more than four fifths (82%) reported that, even on a good day, they would be capable of comfortably walking no more than 100m without needing to take a rest. Whilst less than a fifth of the sample (15%) reported that they always need assistance when going out, close to half of the sample (44%) stated that they do not go out as often as they would like to, and a similarly high proportion (41%) stated that they always had to plan their journeys really carefully.

Nearly three quarters of the sample (71%) uses the internet in connection with their travel, and nearly all possess a mobile phone, with almost half (49%) being smartphone users. Yet, only just over a half of the sample (52%) report that they use their mobile phone to assist with travel at present, and very few (7%) reported having specific travel apps which they use.

The stated choice experiment demonstrates that some smartphone app attributes are indeed valued, whilst others are not. For car users, the most useful attributes of the apps presented to them were those which provided them with en-route directions and those which enabled them to request assistance via road break-down services and to pre-book a disabled parking space. The values obtained for these attributes can be thought of as being approximately equivalent to the value of saving 10-20 minutes travel time on a round trip.

For the public transport users, the most useful attributes of the apps presented to them were those which enabled them to pre-book staff assistance and to pre-book an accessible taxi, and those which provided them with information on next station/stop and arrival time, with up to date connection information and with accessibility information about the arriving train or bus. The values obtained for these attributes can be thought of as being in a range approximately equivalent to the value of saving 10-40 minutes travel time on a round trip. Interestingly, the values of the features of an app and the propensity to buy one are somewhat larger for public transport than car users which, given that the consequences of poor accessibility information and support are likely to be more problematic when travelling via public transport, seems quite plausible.

The survey assumed that smartphone apps would be most useful for trips of a less routine nature, and so was focused on respondents' occasional or rare medium to long-distance trips. It emerged that some 20% of the sample had, in fact, not made such a trip recently and so these respondents were screened out from taking part in the stated choice experiment. One useful area for future development, therefore, would be to conduct further work with this group, to understand the reasons for them not making any non-routine medium to long-distance trips and to test the assumption about the type of trip smartphone apps would be most useful for.

On the framework of COMPASS Case Study **ITS Solutions for Barcelona Bus Network**, a survey was carried out at different access points of **Rasseig de les Aigües de Barcelona** on the 3rd of February of 2013, from 8 am till 5 pm (9 hours in total). A total number of 533 surveys were obtained, 240 of which to bikers and 329 to pedestrians.

The survey was focused on gaining knowledge of:

- The citizens' awareness of the services that TMB offers today to improve the general bus services in Barcelona (orthogonal reorganisation of bus services, upgraded bus stops, TMB smart phone app);
- The citizens' awareness of the services that TMB (Barcelona's bus operator) offers to access the mountain neighbourhoods of Barcelona (neighbourhood buses);
- The willingness of citizens to pay for additional services provided with smart phone applications.

Passeig de les Aigües de Barcelona is located in the Tibidabo hills of Barcelona. It is a recreational path for bikers and hikers overlooking the city of Barcelona, just above a set of districts characterised on the one hand for having difficult topographic conditions and relatively low population densities, and on the other side for having an increasingly old population. Most respondents accessed the Passeig for recreational purposes.

The main results of the survey are as follows:

- Only 7% of respondents used public transport to access to Passeig de les Aigües. 54% walked or cycled, and 39% of respondents used private motor vehicle. The majority of bikers (81%) accessed to the pathway by cycling. Pedestrians accessed to the pathway mostly by car (48%).
- The majority of respondents (59%) were aware of the on-going restructuring of the Barcelona bus network in Barcelona. Regular users of public transport were more aware (72%), whereas only 34% respondents who used other transport modes (private car, cycling, and foot) were aware of the new orthogonal bus network.
- Only 16% of total respondents used the TMB smart phone app. Those who did not use it either did not own a smart phone, did not know the app, or were just not interested. 52% of respondents who owned a smart phone knew the TMB smart phone application. Of these, 55% used it.
- 54% of respondents were aware of the existence of neighbourhood bus services provided by TMB. Barcelona residents respondents knew this service better: 66%.
- 50% of respondents were willing to pay for smart phones apps that could provide information about Tibidabo and the mountain neighbourhoods, and that would grant personal assistance in case of emergency.
- 32% of respondents would be willing to pay for a demand responsive transport service to bring them to Passeig de les Aigües from different areas of Barcelona. Pedestrians would be more willing to pay (38%) than cyclists (21%).
- 30% of respondents would be willing to pay for a demand responsive transport service to bring them from Passeig de les Aigües and other areas of the mountain to closest public transport station. 35% of pedestrians and 22% of bikers.
- 24% of bikers would be willing to use a new bike sharing system based on mountain bikes in the area of Tibidabo.
- 18% of people driving to Passeig de les Aigües would be willing to pay to book a parking space using a smart phone. 11% would be willing to pay up to " 1; 6% up to " 2; and 1% up to " 3.

To sum it up, the following main conclusions can be extracted:

- The awareness of area inhabitants of the improvements TMB is doing in the Barcelona bus network and bus services is relatively high. Area inhabitants showed relative high awareness of initiatives by TMB to improve bus services in Barcelona, especially regular users of the municipal public transport. In particular, 3 out of 4 respondents were aware of the reorganisation of the bus services in Barcelona, and 2 out of 3 were aware of the existence of neighbourhood proximity bus services providing access to the mountain neighbourhoods.
- Awareness raising of smart phone applications providing information on public transport services seems necessary. Amongst those owning a smart phone and knowing the TMB bus service information smart phone application, more than 1 out of 2 use it. However, the overall usage of this application amongst area inhabitants is low with only 16% of respondents. Most users either

do not own a smart phone (1 out of 3) or they do own it but are not aware of the existence of the app (another 1 out of three).

- Willingness of citizens to pay for additional services, provided with smart phone applications is low. Applications which attract most interest by users are related to guidance and personal safety (emergency assistance), 1 out of 2 revealing they would pay for their acquisition. Parking booking applications seem not attractive enough. Proposals for complex services linked to smart phone applications, such as DRT systems to access ~~W~~aszeig de les Aigües+ or mountain bike sharing systems are perceived as relatively less relevant, with only around 1 out of 5 willing to pay for them, depending on the apps.

The survey for **case study 5 on future interurban public transport in warminsko-mazurskie voivodship** has been conducted in two stages . first there was a quantitative assessment of current and potential users needs and their attitudes towards proposed ICT solutions in public transport in the area. The following ICT based improvements have been tested: internet based travel planners, electronic real-time information at bus stops, ticket purchasing via mobile phones / internet, real-time information on services via mobile phones / internet, real-time information on estimated arrival times, stops, route on board of vehicles, and demand responsive services. The second stage was based on focus groups with in-depth analysis and provided more detailed information or explanation why certain attitudes are prevailing.

The analysis shows that:

- A strong majority of users accepts ICT solutions in bus transport.
- There are differences in acceptance levels between different distance passengers (here local, medium distance . defined as within the region - and long-distance travels have been analysed). Applications of ICT solutions based on mobile phones and internet is important especially for long-distance travellers. Overall, users who travel only locally rated this feature at 2.7 (on a scale of 1- definitely not useful, 5-definitely useful) while those travelling medium distances considered it more useful with an average rating of 3.12. At the same time those who travel over 100 km attach to this type of application an even higher value, rating it at 3.31. But there is no one pattern showing higher or lower acceptance across all proposed solutions; it is rather that acceptance levels among different distance users vary depending on the particular solution considered.
- The acceptance levels vary significantly between different user age groups. The strong majority of proponents could be established in younger user groups while high opposition is noted among oldest users. Not surprisingly, willingness to accept new internet or mobile phone based solutions is higher among younger people. To illustrate this pattern the example of real-time electronic information could be used. For the age group of 15-18 years old real-time information scored highest 3.74 points for those of 19-29 years it was 3.63, for travellers aged 30-45 the score was 3.5. At the same time older users were not impressed with those aged 46-60 rating this innovation at 2.18 and those over 60 years of age at only 1.56.
- The perceived time savings on the user part are as follows: for local travel passengers expect to save about 15 minutes, the same holds true for long-distance travellers while medium distance expectation is of about 12 minutes. Altogether expectations are consistent and average at 14 minutes. It could be concluded that time savings of about 14 minutes are certainly more valuable to those travelling short distances.
- The highest time savings are expected by members of the age group 30-45 (20 minutes) while those who pointed at the proposed solution as most useful (younger users) expect to save due its introduction on average 13 minutes. At the same time it is obvious that the main reason of time saving results from elimination of need to be at the bus stop earlier than necessary. Yet focus groups interviews show that it seems that time savings do not play a central role in shaping user preferences. It is rather increased knowledge and higher level of certainty as to the services which are sought after.
- Usefulness of ICTs differ by type of ICT - with regard to travel planners, electronic information on coach stops and on-board electronic information there is clear majority of supporters. At the same time electronic ticketing or real-time vehicle positioning information is sought after by about 50% of users. Lowest interest is expressed in regard to demand responsive service with only 37% in favour of this measure.

- Users are generally unwilling to pay for any additional services and expect that cost will be fully born by the service provider. Among those who accept additional charges the majority (75%) is prepared to pay minimal amount per use (PLN 1 = about " 0.22).
- Transport service providers consider proposed ICT solutions as not economically viable in rural areas. They point out the high cost of their development with no substantial gains to them. The only justifiable way to introduce ICTs is either by government sponsored programmes or through ticket price increase.
- Users, although positive towards ICTs, do not accept additional charging. Proposed ICTs have the theoretical potential to encourage modal shift. As many as 20-30% of users declare that they might shift from private car use in favour of public bus. But there are only 2%-5% who will certainly do so, while the rest declares a possible change in behaviour or that they will switch to public transport on some occasions.

Summarising the results of the analysis of potentiality for ICT introduction into public transport in rural areas it could be said that there is rather strong acceptance on the user part. At the same time there is almost universal lack of acceptance for additional payments for use of ICTs. This could be perceived as serious handicap in development of ICTs and their practical introduction. On the other hand in-depth analysis shows that willingness to pay is significantly higher among younger users, thus ICT solutions are much more feasible in the future. There are no technology barriers due to the fact that internet/mobile phone technology is widespread even in rural areas and the technical applications for ICTs also have already been introduced in many urban areas, and the same technology could be used in rural settings. Considering that there are no significant legal and organisational barriers preventing their introduction, it could be said that ICTs can be easily introduced into rural areas under the condition that the particular ICT scheme is economically viable.

In the section of the report, the results from the telephone survey about **bike-sharing schemes carried out in Vienna and Lower Austria in 2013**, as well as the telephone survey carried out in Lower Austria in 2009 where comparable, are shown. From the results, the following conclusion can be derived as the main points.

- There is an uptrend regarding bicycle use (including non-shared bicycle) in general observed from the comparison in Lower Austrian data.
- People in the rural area tend to use bike-sharing more in Vienna rather than at home.
- Awareness of the Citybike Wien by Viennese people is already high, with 9 out of every 10 respondents being aware of it. Awareness by the Lower Austrians is also high, with 7 out of every 10 respondents being aware of it.
- Awareness of the bike-sharing schemes in Lower Austria has not gone up at large.
- About 71% in Vienna and 83% in Lower Austria have never used a shared bike.
- Most the users do not use the shared bike often, typically once or twice a year.
- Shared bikes are mainly used for leisure trips.
- Despite such large proportion of the usage for leisure trips, about 10% and 6% in Vienna use the shared bike for commuting and going home respectively. This implies that the bike-sharing is used as an alternative transport mode for daily travel usages among some users.
- To make the people aware, visibility on the street plays the most important role.
- Typical willingness to pay is around " 0.50 to " 1 per hour and thus the current pricing seems appropriate.
- Many people will accept automated booking/identification methods. Especially, card-based or phone-based identification is preferred. The fact that most of the respondents are familiar with the automated ticketing and Internet-based services confirms this. Other state-of-the-art identification methods seem unaccepted at the moment.
- About half of the people in Lower Austria and about 30% of the Viennese people still want to pay in cash rather than other methods such as debit or credit cards.

- Further development of reporting broken bicycles by users (e.g. through apps), app indicating general conditions of bicycles and short-term reservation (if there are only a few bikes available at the station) can be found useful by the users.
- Among non-users, a certain proportion between one-third and two-thirds find themselves as potential users of the shared bikes. However, they require a denser network of the stations, easy booking system, and better bicycles to be shared.

To summarise, bike-sharing is well-known among the population, while those who actually use it appear to be limited. Among those who actually use it, the leisure trips are dominant, while a small proportion of the people in Vienna uses it as an alternative transport mode for daily trips. The current pricing appears to be appropriate, while, as the certain proportion of the respondents still prefers the cash payment to the debit or credit card payments, such payment methods have to be well considered, even if the current system with debit or credit card payments has to be kept to meet the needs for those who wish to pay with them. The preference for the identification method is not uniform and there are two clear groups, one that prefers phone-based identification and one that prefers card-based identification. This implies that providing several identification methods for the same system will meet the diversifying preferences by the users.

Regarding the future development, there are two important development trends identified to capture more potential users. The first is to make the stations dense and/or extended so that more population can be covered within a reasonable catchment area from the stations. This will eventually help to increase the awareness through on-street visibility of the bicycle. Such enriched ~~hard~~ infrastructure for the bike-sharing will capture more potential users.

The second important future development should be based on the part related to ICTs, namely short-term reservation to make guaranteed users an available bike at a station, diversifying identification methods especially with phone and own or bank/credit cards, and further easy booking/identification systems, as well as the smartphone apps to show availability and conditions of bicycle and to report broken bikes. Regarding booking/identification system, it will have to be considered to integrate various schemesq user accounts so that one user account from a scheme can be recognised automatically by another scheme, as bike-sharing schemes require the users to create an account for it. Especially in light of the fact that a certain number of the people from rural areas use the system not at home but rather at the urban destination, such as Lower Austria using the shared bike more in Vienna, such integrated user account may be fairly useful to motivate the people to use the bicycle in both areas. For those from rural areas registered for an urban bike-sharing system will be able to use the shared bike at home with less barrier, while for those from cities registered for an urban bike-sharing system will be able to use the bikes in their rural leisure destinations.

The case study on **grass-root cooperative smartphone-based car-sharing** investigated four car-sharing groups in rural Austrian municipalities and in a city where conventional and electric vehicles are shared and booked via a smartphone-based system called CARUSO.

All in all the **focus groups** comprised of a balanced number of male and female users, although in one group women were overrepresented and in another group men were. The respondents are between 30 and 50 or 60 years old and all of them have prior experience with the internet.

The following conclusions are derived from the survey.

- The investigated car-sharing model differs among the four car-sharing groups in respect of the offered cars (conventional or electric, number of cars), the usage of the car (mainly private or mainly business), the hand-over of keys (private or key-box) and the pricing for car-sharing.
- Every group has a different history of formation and different conditions for car-sharing.
- The limited number of the car-sharing group members, which is up to 30 persons, seems to be an important factor for this grass-root car-sharing system. Almost all members know each other and therefore the barriers are lower for booking the car casually.
- In such communities members know and trust each other and they have a higher responsibility to keep the condition of the cars than they would have in conventional car-sharing schemes.

- The high usability of the CARUSO system is recognised in all four car-sharing groups as a very important advantage of car-sharing. Even people with little experience with the internet are able to book on their own.
- The motivation for starting car-sharing differs from group to group, while one important common factor is the curiosity whether this system will work or not. Saving money and saving a second car are also strong reasons for car-sharing. If the shared car can be used for special purposes such as a van to transport larger volume of goods, the willingness for car-sharing can get higher.
- Most of the participants of the focus group interviews own a car and the car-sharing car replaces a second car. In some cases sharing a car can actually substitute the main car even in remote rural municipalities with scarce public transport.
- The booking tool is very helpful to estimate the actual driving range of the electric vehicle (EV) as the battery level is also shown in the booking system (if an EV is shared).
- Sharing a car raises the awareness about the own mobility behaviour and can lead to changes in that.
- The respondents see many advantages in the grass-root car-sharing model, especially in the small community and the low costs for driving a car.
- Many members recognise the easy user interface of CARUSO also as an important advantage.
- Most of the disadvantages that the respondents referred to were associated with the electric vehicle, especially the driving range of the car and the sparse charging infrastructure.

As such, the CARUSO system is very flexible and it can easily be adapted to very different groups and conditions. This flexibility enables the users to organise the groups based on their needs. The simple user interface benefits the users, and thanks to that the car-sharing is usable also for those who are not used that much to the web-based user interfaces. The users do not find serious disadvantages in the system while they appear to benefit from the advantages. These imply that this type of car-sharing can be applied in various different conditions. By and large, the system is well accepted by the users.

The curiosity seems the most important motivation and thus it seems important to let them try out such systems to know whether car-sharing fits to their mobility behaviour or not. Lowering travel cost and fixed costs of a car is also an important motivation. The users appear to recognise the car as a means of transport out of many and not as a status symbol. This is probably an important pre-condition to get motivated, although it was not explicitly mentioned in the interviews.

The two ICT-based solutions surveyed through an on-line survey are fairly similar in that the web-based and/or smartphone interfaces enable car-sharing without any large companies offering vehicles to be shared. However, the two systems are fairly different regarding the formation of user groups or not. CARUSO is a closed-group system and non-members do not have access to the car designated for a group, while Carsharing 24/7 is an open system that one can theoretically share the member's car with anyone once a person is registered in the system.

The main findings from the survey are the following. Each point is common among CARUSO users and Carsharing 24/7 users unless noted.

- More males are using the Austrian private car-sharing than females.
- Typical users are in the age between 26 and 50.
- Generally, the users tend to be highly educated compared to the general population.
- Other aspects such as occupation and automobile ownership and their usage appear to be around average.
- Among those who do not own their own cars, it is typical that they have access to cars of other family members, relatives and/or friends, while most of them prefer the car-sharing vehicle to such other accessible vehicles.
- Regarding the experiences with ICTs, there seems no practical barrier as most of the users recognise themselves as fairly experienced with the internet or any other ICT-based services.

- CARUSO users, who tend to be in the rural area, appear to use the grass-root car-sharing more as a second car.
- Carsharing 24/7 users, who tend to be in the urban area, appear to use the car-sharing more as a main car.
- Among Carsharing 24/7 users, it seems that there are more people who want to offer their own cars for sharing. This implies that in the urban area there are many car owners who are ready to offer their car for car-sharing.
- CARUSO users tend to use the car-sharing car more for daily travel purposes for shorter distances.
- Carsharing 24/7 users tend to use it more as the car for weekend leisure for longer distances.
- The users appear to be motivated, in terms of mobility-related aspects, mainly by the high cost of own cars regarding both purchase and maintenance and the rare need of the car (this applies especially to the Carsharing 24/7 users) as well as because the users find sharing a car is more practical than owning car on their own.
- In addition, many users are motivated by the thoughts for the environment.
- Special types of vehicles such as EV or van can play an important role as motivations; this is significant among CARUSO users, for whom such special vehicles are offered as car-sharing vehicles.

By and large, CARUSO, which is group-based and more in the rural area, tend to be used as what the term car-sharing connotes such as business, private and shopping trips as well as leisure trips substituting the second car, while Carsharing 24/7, which is rather open and more in the urban area, tend to be used in a somewhat similar manner to rent-a-car, that enables the users with more leisure trips for longer distance. It has to be however noted that this does not mean that the users of each system do not use the car for other purposes and other distance ranges. A certain numbers of trips are made with the car-sharing vehicles for business, private and shopping trips, and travel distances of course vary among the trips.

Although the direct effect with/without the formation of a group cannot be observed through this on-line survey, the formation of the group may enable the users to take the car-sharing vehicle with fewer barriers compared to the open system. Such aspect has to be studied more to reveal the effect of the group formation more in detail.

Grass-root private car-sharing has, as the CARUSO example demonstrates, much potential not only in large cities but also in smaller cities and in the rural area. The **telephone survey** was carried out in smaller municipalities in the western and eastern part of Austria where car-sharing is offered in only a few of them.

Among the respondents more female than male persons answered the questions. The majority of the respondents are between 40 and 65 year old which could be explained by the directory used (mostly landlines) and by the fact that older persons are more likely to participate in surveys. The education of the respondents is remarkably high in comparison to the Austrian average with a third having a university degree. The majority of the respondents are employed full- or part-time but also many retired persons participated in the survey. About two thirds of the respondents are using public transport at least once a month, weekly or even daily.

The main findings from the surveys are the following points.

- The term car-sharing has a very high publicity even in rural areas where there is no such offer.
- Nevertheless people do not use a car-sharing offer as of yet.
- The main reason for not using car-sharing is the non-availability of such offers in smaller cities and rural areas.
- ICT-availability does not seem to be a barrier when it comes to the grass-root car-sharing as many respondents report that some devices are available such as personal computers and/or smartphones.

- Many respondents point out that the availability of the main car is also an important reason not to use the car-sharing.

In light of the high publicity of the term car-sharing, a higher number of car-sharing offers and locations in rural areas could attract more users. Considering that CARUSO attracts many users' attention to substitute the second car in the rural area often with a special type of vehicles such as EV and/or van, such grass-root car-sharing still appears to have much potential. There seems no serious barrier in terms of the concept itself and the ICTs while the availability of the offer itself seems the key. As the grass-root car-sharing needs an initiator of the group, setting up a group depends much on the spontaneity of the initiator and/or group members. This point is not fully taken account of so far (e.g. there is no sales personnel approaching potential initiators) and thus it appears to be a future challenge to make it better known among potential initiators and users.

11 REFERENCES

Citybike Wien (2013). CITYBIKE WIEN TARIFE, <http://www.citybikewien.at/> .

NÖ Energie- & Umweltagentur Betriebs GmbH (2013). Fahrpreise, <http://www.nextbike.at/1377.html> .

OBIS (2013), http://www.obisproject.com/palio/html.run?_Instance=obis .

Pfaffenbichler P., Pickl N. (2009). Befragung Freiradl, NÖ - Organisation und Auswertung Befragung Freiradl, NÖ. AEA, Wien.

Rabiee, F. (2004): Focus-group interview and data analysis. In: Proceedings of the Nutrition Society (2004), 63, 655 . 660. URL
http://journals.cambridge.org/download.php?file=%2FPNS%2FPNS63_04%2FS0029665104000874a.pdf&code=a3faee256a0a4d6bae713db408d36660

STATISTIK Austria (2002). VOLKSZÄHLUNG Hauptergebnisse I . Österreich.

STATISTIK Austria (2003). VOLKSZÄHLUNG Hauptergebnisse I . Niederösterreich.

STATISTIK Austria (2011). Ausstattungsgrad der Haushalte . Bundesländerergebnisse.
http://www.STATISTIK.at/web_de/static/ausstattungsgrad_der_haushalte_-_bundeslaenderergebnisse_059000.pdf .

STATISTIK Austria (2013), http://www.statistik.at/web_de/statistiken/arbeitsmarkt/index.html .

VCÖ (2013). Österreicher besitzen mehr als sechs Millionen Fahrräder - Fahrrad braucht nach Winter ein Service - 06.03.2013. Press Release. <http://www.vcoe.at/de/presse/aussendungen-archiv/details/items/vcoe-oesterreicher-besitzen-mehr-als-sechs-millionen-fahrraeder-fahrrad-braucht-nach-winter-ein-service-06032013>.

APPENDIX

12 APPENDIX - QUESTIONNAIRES

12.1 QUESTIONNAIRES FOR CASE STUDY 3 SURVEY - ACCESSIBILITY APPLICATIONS FOR DISABLED PEOPLE

Are you affected by some sort of physical impairment or difficulty in your everyday life?

- ☐ Yes
- ☐ No

Which of the following best describes your physical mobility impairment?

- ☐ Walking difficulties which require the use of a stick or some other walking aid (e.g. as a result of arthritis)
- ☐ Walking difficulties, though not to the extent of needing to use a walking aid
- ☐ Wheelchair user
- ☐ Chronic (heart or) respiratory disease
- ☐ Other (please specify)
- ☐ None

What is your gender?

- ☐ Male
- ☒ Female

What is your age?

What is your occupation?

- ☐ Full time employee
- ☐ Part time employee
- ☐ Self-employed
- ☐ Student
- ☐ Retired
- ☐ Full time home maker
- ☐ Unemployed

How many people, including yourself, are there in your household?

- ☐ One (I live alone)
- ☒ Two
- ☐ Three
- ☐ Four
- ☐ Five
- ☐ Six or more

How many of these are aged less than 16 years of age?

- ☐ 0
 - ☐ 1
-

What is the actual income of your household before the deduction of tax?

- ☐ Less than £10,000
 - ☐ £10,000 - £19,999
 - ☐ £20,000 - £29,999
 - ☐ £30,000 - £39,999
 - ☐ £40,000 - £49,999
 - ☐ £50,000 - £59,999
 - ☐ £60,000 - £69,999
 - ☐ Over £70,000
 - ☐ Prefer not to say
-

Does your physical mobility fluctuate significantly from one day to the next?

- ☐ No, it is fairly constant
 - ☐ Yes, there are 'good' and 'bad' days, in roughly equal proportion
 - ☐ Yes, there are 'good' and 'bad' days but more 'bad' than 'good'
 - ☐ Yes, there are 'good' and 'bad' days but more 'good' than 'bad'
-

On a good day, approximately how far can you comfortably walk without needing to take a rest?

- ☐ Less than 50 metres
 - ☐ 50 metres
 - ☐ 100 metres
 - ☐ 150 metres
 - ☐ More than 150 metres
-

What are the major obstacles you experience while walking?

Tick all that apply

- ☐ Steps
 - ☐ Kerbs
 - ☐ Uneven surfaces
 - ☐ Narrow footways
 - ☐ Overall distance
 - ☐ Lack of rest points
 - ☐ Other (please specify)
-

How does your physical mobility impairment affect your travel ?

Tick all that apply

- ☐ I'm only able to go travelling on 'good' days
 - ☐ I can do local trips by myself, but need assistance during longer trips
 - ☐ I always need assistance when going outside, irrespective of the trip
 - ☐ I always have to plan my journeys really carefully
 - ☐ Not specifically, but walking takes more time
 - ☐ I don't go out as much as I'd like to
 - ☐ I never go out
-

Are you able to travel by public transport?

- ☐ Yes, without any assistance
 - ☐ Yes, but I need assistance in getting on and off the vehicle
 - ☐ Yes, but I need assistance (other than with getting on and off the vehicle)
 - ☐ No
-

Do you have a driving license?

- ☐ Yes
 - ☐ No
-

Do you have access to a car?

- ☐ Yes, whenever I want
- ☒ Yes, but shared with other drivers
- ☐ Yes, but someone else needs to drive
- ☐ No

Who usually provides the required assistance during a trip?

- ☐ Friends and family
- ☐ Neighbours
- ☐ Staff at shops, train and bus stations, etc
- ☐ My PA or carer
- ☐ Other (please specify)

What kind of assistance do you need during a trip?

Thinking about your travel over the past year or so, what types of trip do you make?

Short distance

- ☐ To work/education/shopping/health
- ☐ To visit nearby friends and family or other local trips

Medium-long distance: greater than 10 miles

- ☐ To work out of town
- ☐ to shop out of town
- ☐ To an out of town health appointment
- ☐ to go on a short break or holiday
- ☐ To visit friends and family out of town or other non-local trip

And how often do you make this type of trip?

	Frequently (5 per week)	Occasionally (5 per month)	Rarely (5 per year)
To work/education/shopping/health	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To work out of town	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Do you make use of the internet in connection with your travel?

- ☐ Yes, sometimes
- ☐ Yes, always
- ☐ No

Do you have a mobile phone?

- ☐ Yes, but it is not a smartphone
- ☒ Yes, and it is a smartphone
- ☐ No

Do you use your mobile phone to assist with your travel?

- ☐ Yes, in order to speak to people
- ☐ Yes, in order to access the internet
- ☐ Yes, I have specific apps on my phone which assist me
- ☐ No

We'd like you to tell us some more details about one of the medium-long distance trips you said that you made either occasionally or rarely. Please think specifically about one of those trips... What was the destination/purpose?

- ☐ Travel to work
- ☐ Travel in the course of work
- ☐ Other (please specify)

Again, thinking about that same specific medium-long distance journey what was the distance?

- ☐ 10-30 miles
- ☐ 30-100 miles
- ☐ Greater than 100 miles

Again, thinking about that same specific medium-long distance journey, what was the mode of the transport you used?

- ☐ Car driver
- ☐ Car Passenger
- ☐ Train
- ☐ Bus
- ☐ Taxi

Again, thinking about that same specific medium-long distance journey, what was the assistance used?

Tick all that apply

- ☐ Getting into/onto the vehicle
- ☐ Getting out of/off the vehicle
- ☐ Information about the accessibility of facilities (e.g. services stations, parking, railway stations etc.)
- ☐ Satellite navigation
- ☐ Other (please specify)

Again, thinking about that same specific medium-long distance journey, how long did the journey take?

- ☐ Less than half an hour
 - ☐ Half an hour-one hour
 - ☐ One-two hours
 - ☐ Two-four hours
 - ☐ More than four hours
-

In the next screens we will present you with descriptions of some possible Apps for your smartphone. Each of the apps aim, in different ways, to help you with your travel. This help could be in the form of standard journey information about travel times and routes, or in the form of more specific information relating to the accessibility characteristics of the journey. In addition, some of the Apps will have specific features intended to facilitate your journey as a traveller with mobility difficulties, some of which features will allow for up to the minute information and communication while you travel.

You will be presented with two different apps at a time, and, thinking about how they might help with the journey you have just described to us, you are requested to select which you would prefer. Note that, whilst the Apps are intended to make specific aspects of the trip more convenient, using them comes at a cost.

Please click "Next" to continue...

Thinking about that same specific medium-long distance journey **Travel to work**, which app would you prefer out of the two options below?

Your travelling mode would be by **Train**.

Description	Option A	Option B
Accessibility info	Distance between and accessibility of platforms	Distance between and accessibility of connecting services
Pre-booking options	Pre-book accessible taxi	No options
Real - time App	Yes	No
Route info	Up to date connection info at interchange	No
Efficiency Gain in Time	15.00%	5.00%
Assist me request	Platform assistance	No
Subscription model	Permanent license	Pay as you go (per trip payment)
Cost (£)	£50	£3

Please
select your
answer
here:

None of these ●

1/10

How easy would you find it to make this journey with the first of these apps, on scale from 1 (very easy) to 5 (very difficult)?

● Very easy ● Easy ● Neither easy nor difficult ● Difficult ● Very difficult

How easy would you find it to make this journey with the second of these apps, on scale from 1 (very easy) to 5 (very difficult)?

● Very easy ● Easy ● Neither easy nor difficult ● Difficult ● Very difficult

How easy did you find it to make a decision between the presented Apps, on scale from 1 (very easy) to 5 (very difficult)?

● Very easy ● Easy ● Neither easy nor difficult ● Difficult ● Very difficult

Thinking about that same specific medium-long distance journey **Travel to work**, which app would you prefer out of the two options below?
Your travelling mode would be by **Train**.

Description	Option A	Option B
Accessibility info	Distance between and accessibility of connecting services	Station Map
Pre-booking options	No options	No options
Real - time App	Yes	Yes
Route info	Up to date connection info at interchange	Accessibility info of arriving train
Efficiency Gain in Time	10.00%	5.00%
Assist me request	Platform assistance	Platform assistance
Subscription model	Annual subscription	Annual subscription
Cost (£)	£25	£35

Please select your answer here:

☐

☐

None of these ☐

2/10

How easy would you find it to make this journey with the first of these apps, on scale from 1 (very easy) to 5 (very difficult)?

☐ Very easy
 ☐ Easy
 ☒ Neither easy nor difficult
 ☐ Difficult
 ☐ Very difficult

How easy would you find it to make this journey with the second of these apps, on scale from 1 (very easy) to 5 (very difficult)?

☐ Very easy
 ☐ Easy
 ☐ Neither easy nor difficult
 ☐ Difficult
 ☐ Very difficult

How easy did you find it to make a decision between the presented Apps, on scale from 1 (very easy) to 5 (very difficult)?

☐ Very easy
 ☐ Easy
 ☐ Neither easy nor difficult
 ☐ Difficult
 ☐ Very difficult

Thinking about that same specific medium-long distance journey **Travel to work**, which app would you prefer out of the two options below?
Your travelling mode would be by **Train**.

Description
Accessibility info
Pre-booking options
Real - time App
Route info
Efficiency Gain in Time
Assist me request
Subscription model
Cost (£)

Option A
Distance between and accessibility of connecting services
Pre-book accessible taxi
No
No
5.00%
No
Pay as you go (per trip payment)
£1
<input type="radio"/>

Option B
Distance between and accessibility of platforms
Pre-book staff assistance at station
Yes
Info on next station and estimated arrival time
15.00%
No
Permanent license
£100
<input type="radio"/>

**Please
select your
answer
here:**

None of these ☐

3/10

How easy would you find it to make this journey with the first of these apps, on scale from 1 (very easy) to 5 (very difficult)?

- ☐ Very easy
 ☐ Easy
 ☐ Neither easy nor difficult
 ☐ Difficult
 ☐ Very difficult

How easy would you find it to make this journey with the second of these apps, on scale from 1 (very easy) to 5 (very difficult)?

- ☐ Very easy
 ☐ Easy
 ☐ Neither easy nor difficult
 ☐ Difficult
 ☐ Very difficult

How easy did you find it to make a decision between the presented Apps, on scale from 1 (very easy) to 5 (very difficult)?

- ☐ Very easy
 ☐ Easy
 ☐ Neither easy nor difficult
 ☐ Difficult
 ☐ Very difficult

Thinking about that same specific medium-long distance journey **Travel to work**, which app would you prefer out of the two options below?
Your travelling mode would be by **Train**.

Description
Accessibility info
Pre-booking options
Real -time App
Route info
Efficiency Gain in Time
Assist me request
Subscription model
Cost (£)

Option A
Distance between and accessibility of connecting services
No options
No
No
5.00%
No
Annual subscription
£25
<input type="radio"/>

Option B
Distance between and accessibility of platforms
Pre-book accessible taxi
No
No
0.00%
No
Annual subscription
£15
<input type="radio"/>

**Please
select your
answer
here:**

None of these ☐

4/10

How easy would you find it to make this journey with the first of these apps, on scale from 1 (very easy) to 5 (very difficult)?

☐ Very easy ☐ Easy ☐ Neither easy nor difficult ☐ Difficult ☐ Very difficult

How easy would you find it to make this journey with the second of these apps, on scale from 1 (very easy) to 5 (very difficult)?

☐ Very easy ☐ Easy ☐ Neither easy nor difficult ☐ Difficult ☐ Very difficult

How easy did you find it to make a decision between the presented Apps, on scale from 1 (very easy) to 5 (very difficult)?

☐ Very easy ☐ Easy ☐ Neither easy nor difficult ☐ Difficult ☐ Very difficult

Thinking about that same specific medium-long distance journey **Travel to work**, which app would you prefer out of the two options below?
Your travelling mode would be by **Train**.

Description
Accessibility info
Pre-booking options
Real -time App
Route info
Efficiency Gain in Time
Assist me request
Subscription model
Cost (£)

Option A
Station Map
Pre-book accessible taxi
Yes
Up to date connection info at interchange
10.00%
On-board assistance
Pay as you go (per trip payment)
£1
<input type="radio"/>

Option B
Staff availability on station and in train
No options
Yes
No
5.00%
On-board assistance
Permanent license
£75
<input type="radio"/>

**Please
select your
answer
here:**

None of these ☐

5/10

How easy would you find it to make this journey with the first of these apps, on scale from 1 (very easy) to 5 (very difficult)?

☐ Very easy ☐ Easy ☐ Neither easy nor difficult ☐ Difficult ☐ Very difficult

How easy would you find it to make this journey with the second of these apps, on scale from 1 (very easy) to 5 (very difficult)?

☐ Very easy ☐ Easy ☐ Neither easy nor difficult ☐ Difficult ☐ Very difficult

How easy did you find it to make a decision between the presented Apps, on scale from 1 (very easy) to 5 (very difficult)?

☐ Very easy ☐ Easy ☐ Neither easy nor difficult ☐ Difficult ☐ Very difficult

Thinking about that same specific medium-long distance journey **Travel to work**, which app would you prefer out of the two options below?
Your travelling mode would be by **Train**.

Description
Accessibility info
Pre-booking options
Real - time App
Route info
Efficiency Gain in Time
Assist me request
Subscription model
Cost (£)

**Please
select your
answer
here:**

Option A
Staff availability on station and in train
No options
Yes
Info on next station and estimated arrival time
0.00%
No
Permanent license
£100

Option B
Station Map
Pre-book accessible taxi
Yes
No
15.00%
On-board assistance
Pay as you go (per trip payment)
£3

None of these ☐

6/10

How easy would you find it to make this journey with the first of these apps, on scale from 1 (very easy) to 5 (very difficult)?

☐ Very easy ☐ Easy ☐ Neither easy nor difficult ☐ Difficult ☐ Very difficult

How easy would you find it to make this journey with the second of these apps, on scale from 1 (very easy) to 5 (very difficult)?

☐ Very easy ☐ Easy ☐ Neither easy nor difficult ☐ Difficult ☐ Very difficult

How easy did you find it to make a decision between the presented Apps, on scale from 1 (very easy) to 5 (very difficult)?

☐ Very easy ☐ Easy ☐ Neither easy nor difficult ☐ Difficult ☐ Very difficult

Thinking about that same specific medium-long distance journey **Travel to work**, which app would you prefer out of the two options below?
Your travelling mode would be by **Train**.

Description
Accessibility info
Pre-booking options
Real - time App
Route info
Efficiency Gain in Time
Assist me request
Subscription model
Cost (£)

**Please
select your
answer
here:**

Option A
Staff availability on station and in train
Pre-book staff assistance at station
No
No
10.00%
No
Pay as you go (per trip payment)
£3

Option B
Station Map
Pre-book accessible taxi
Yes
Info on next station and estimated arrival time
15.00%
Platform assistance
Permanent license
£75

None of these ☐

7/10

How easy would you find it to make this journey with the first of these apps, on scale from 1 (very easy) to 5 (very difficult)?

- ☐ Very easy
 ☐ Easy
 ☐ Neither easy nor difficult
 ☐ Difficult
 ☐ Very difficult

How easy would you find it to make this journey with the second of these apps, on scale from 1 (very easy) to 5 (very difficult)?

- ☐ Very easy
 ☐ Easy
 ☐ Neither easy nor difficult
 ☐ Difficult
 ☐ Very difficult

How easy did you find it to make a decision between the presented Apps, on scale from 1 (very easy) to 5 (very difficult)?

- ☐ Very easy
 ☐ Easy
 ☐ Neither easy nor difficult
 ☐ Difficult
 ☐ Very difficult

Thinking about that same specific medium-long distance journey **Travel to work**, which app would you prefer out of the two options below?
Your travelling mode would be by **Train**.

Description
Accessibility info
Pre-booking options
Real -time App
Route info
Efficiency Gain in Time
Assist me request
Subscription model
Cost (£)

Option A
Staff availability on station and in train
Pre-book accessible taxi
Yes
Accessibility info of arriving train
10.00%
No
Permanent license
£75
<input type="radio"/>

Option B
Station Map
Pre-book accessible taxi
Yes
Info on next station and estimated arrival time
0.00%
On-board assistance
Pay as you go (per trip payment)
£1
<input type="radio"/>

**Please
select your
answer
here:**

None of these ☐

8/10

How easy would you find it to make this journey with the first of these apps, on scale from 1 (very easy) to 5 (very difficult)?

- ☐ Very easy
 ☐ Easy
 ☐ Neither easy nor difficult
 ☐ Difficult
 ☐ Very difficult

How easy would you find it to make this journey with the second of these apps, on scale from 1 (very easy) to 5 (very difficult)?

- ☐ Very easy
 ☐ Easy
 ☐ Neither easy nor difficult
 ☐ Difficult
 ☐ Very difficult

How easy did you find it to make a decision between the presented Apps, on scale from 1 (very easy) to 5 (very difficult)?

- ☐ Very easy
 ☐ Easy
 ☐ Neither easy nor difficult
 ☐ Difficult
 ☐ Very difficult

Thinking about that same specific medium-long distance journey **Travel to work**, which app would you prefer out of the two options below?
Your travelling mode would be by **Train**.

Description
Accessibility info
Pre-booking options
Real -time App
Route info
Efficiency Gain in Time
Assist me request
Subscription model
Cost (£)

Option A
Station Map
No options
Yes
Up to date connection info at interchange
15.00%
No
Pay as you go (per trip payment)
£2
<input type="radio"/>

Option B
Staff availability on station and in train
Pre-book accessible taxi
Yes
No
0.00%
On-board assistance
Permanent license
£50
<input type="radio"/>

**Please
select your
answer
here:**

None of these ☐

9/10

How easy would you find it to make this journey with the first of these apps, on scale from 1 (very easy) to 5 (very difficult)?

☐ Very easy ☐ Easy ☐ Neither easy nor difficult ☐ Difficult ☐ Very difficult

How easy would you find it to make this journey with the second of these apps, on scale from 1 (very easy) to 5 (very difficult)?

☐ Very easy ☐ Easy ☐ Neither easy nor difficult ☐ Difficult ☐ Very difficult

How easy did you find it to make a decision between the presented Apps, on scale from 1 (very easy) to 5 (very difficult)?

☐ Very easy ☐ Easy ☐ Neither easy nor difficult ☐ Difficult ☐ Very difficult

Thinking about that same specific medium-long distance journey **Travel to work**, which app would you prefer out of the two options below?
Your travelling mode would be by **Train**.

Description
Accessibility info
Pre-booking options
Real -time App
Route info
Efficiency Gain in Time
Assist me request
Subscription model
Cost (£)

Option A
Station Map
Pre-book staff assistance at station
Yes
Up to date connection info at interchange
0.00%
Platform assistance
Annual subscription
£35
<input type="radio"/>

Option B
Staff availability on station and in train
Pre-book staff assistance at station
Yes
No
5.00%
No
Annual subscription
£15
<input type="radio"/>

**Please
select your
answer
here:**

None of these ☐

10/10

How easy would you find it to make this journey with the first of these apps, on scale from 1 (very easy) to 5 (very difficult)?

- ☐ Very easy
 ☐ Easy
 ☐ Neither easy nor difficult
 ☐ Difficult
 ☐ Very difficult

How easy would you find it to make this journey with the second of these apps, on scale from 1 (very easy) to 5 (very difficult)?

- ☐ Very easy
 ☐ Easy
 ☐ Neither easy nor difficult
 ☐ Difficult
 ☐ Very difficult

How easy did you find it to make a decision between the presented Apps, on scale from 1 (very easy) to 5 (very difficult)?

- ☐ Very easy
 ☐ Easy
 ☐ Neither easy nor difficult
 ☐ Difficult
 ☐ Very difficult

How easy would you find it to make this journey such as used in the earlier example without the use of any apps, on scale from 1 (very easy) to 5 (very difficult)?

- ☐ Very easy
☐ Easy
☐ Neither easy nor difficult
☐ Difficult
☐ Very difficult

12.2 QUESTIONNAIRES FOR CASE STUDY 4 SURVEY- ITS SOLUTIONS FOR BARCELONA'S LOCAL BUS NETWORK

MOBILITY SURVEY IN THE SUROUNDINGS OF THE BARCELONA MOUNTAIN NEIGHBOURHOODS

PART I. ALL USERS

0. Have you already been surveyed in the %passeig de les Aigües+before?
 Yes No
 (If "Yes" terminate survey)

1. Sex ☐ Man ☐ Woman

2. Age . years

3. Where do you come from? ☐ Barcelona. Specify Neighborhood:
☐ Other municipality. Specify which:

4. Which access to %passeig de les aigües+did you use?

- ☐ Plaça de la Mireia (Esplugues)
☐ Pedralbes
☐ Can Caralleu
☐ Vallvidrera
☐ Bellesguard (Penitents)
☐ Pla dels Maduixers
☐ Arrabassada
☐ Mundet
☐ Valldaura

- ☐ Coll de la Ventosa (Canyelles)
☐ Torre Baró
☐ Other
5. Trip purpose: ☐ strolling ☐ Sports-bike ☐ Sports-jogging ☐ Other
6. How many parties did you come with?
☐ Alone
☐ With family. Specify number of parties: ò ò ò ò ò .
☐ Group of adults. Specify number of parties: ò ò ò ò ò .
7. When do you usually go to %passeig de les Aigües+?
☐ Weekday ☐ Saturday ☐ Sunday / holyday
8. How often do you go to %passeig de les Aigües+?
☐ more than once per week
☐ once per week
☐ once per month
☐ occasionally
9. At which time do you go
☐ early in the morning (7-8h)
☐ middle of the morning (10-11h)
☐ midday (12-13h)
☐ early in the afternoon (16h)
10. How long do you stay
☐ less than 1 hora
☐ 1 to 2 hours
☐ 2 to 4 hours
☐ more than 4 hours
11. Do you own a smartphone? ☐ Yes ☐ No
 (If "NO" go to part II)
12. Do you know the smartphone App by Barcelona Metropolitan Transport (TMB) that provides real-time information? ☐ Yes ☐ No
 (if "NO" go to question 14)
13. Do you use it regularly? ☐ Yes ☐ No
14. Would you pay " 80 cents for a smartphone App providing information about the Tibidavo mountain and user assistance in case of emergency?
☐ Yes ☐ No

PART II. BIKE USERS

15. Which transport mode did you use to go to %passeig de les Aigües+?
☐ Car as driver
☐ Car as a passenger
☐ Scooter / Motorbike
☐ FGC (rail)
☐ RENFE (rail)

- ☐ Funicular
- ☐ Urban bus. Specify line number and destination stop: ò ò ò ò ò ò
- ☐ Interurban bus. Specify line number and destination stop: ò ò ò ò ò ò
- ☐ Metro. Specify destination stop: ò ò ò ò ò ò
- ☐ On foot
- ☐ By bike all the way from home
- ☐ Other

16. Are you aware of the public transport offer available to access the %passeig de les Aigües+?
☐ yes ☐ no

17. Would you be willing to pay for a dedicated transport system for bikes (and passengers) from Barcelona to %passeig de les Aigües+(with demand-responsive pick up points)?

- ☐ No, never
- ☐ Yes. Up to " 1 per trip
- ☐ Yes. Up to " 2 per trip
- ☐ Yes. Up to " 5 per trip

18. Would you be willing to pay for a demand responsive pick up service from different areas of the Tividabo mountain to the closest rail or metro station?

- ☐ No, never
- ☐ Yes. Up to " 1 per trip
- ☐ Yes. Up to " 2 per trip
- ☐ Yes. Up to " 5 per trip

19. Would you be willing to use a mountain bike sharing system?

- ☐ yes ☐ no

20. Do you usually use public transport?

- ☐ yes ☐ no

21. Are you aware of the ongoing restructuration of the Barcelona urban bus network?

- ☐ yes ☐ no

22. Are you aware of the %Neighborhood Bus+service offered by TMB

- ☐ yes ☐ no

If subject answered "Car" in question 15, ask questions 23.a, 24, 25 and 26

23.a Why did you use your car to access the %passeig de les aigües+?

- ☐ No optimal alternative available
- ☐ Better comfort and convenience
- ☐ Because of the availability of parking free-of-charge
- ☐ Others

24. Where did you park?

- ☐ Parking (plaça de la Mireia, Pla dels Maduixers, Valldaura, Coll de la Ventosa, etc)
- ☐ In the road hard shoulder
- ☐ In the street in the closes neighborhood
- ☐ Other. Specify

25. Do you usually find it hard to find available parking space?

- ☐ No. Never
- ☐ Yes. Always
- ☐ Yes. Depending on the time of the day

26. Would you be willing to pay to book a parking space using a smartphone app?

- ☐ No, never
- ☐ Yes. Up to " 1
- ☐ Yes. Up to " 2
- ☐ Yes. Up to " 5

If subject answered "Bike" in question 15, ask questions 23.b

23.b Why did you use your bike to access %passeig de les aigües+?

- ☐ To do sport

- ☐ No optimal alternative available
☐ Other

PART II. PEDESTRIANS

15. Which transport mode did you use to go to %passeig de les Aigües+?
☐ Car as driver
☐ Car as a passenger
☐ Scooter / Motorbike
☐ FGC (rail)
☐ RENFE (rail)
☐ Funicular
☐ Urban bus. Specify line number and destination stop: ò ò ò ò ò ò
☐ Interurban bus. Specify line number and destination stop: ò ò ò ò ò ò
☐ Metro. Specify destination stop: ò ò ò ò ò ò
☐ On foot
☐ By bike all the way from home
☐ Other
16. Are you aware of the public transport offer available to access the %passeig de les Aigües+?
☐ yes ☐ no
17. Would you be willing to pay for a dedicated transport system for bikes (and passengers) from Barcelona to %passeig de les Aigües+(with demand-responsive pick up points)?
☐ No, never
☐ Yes. Up to " 1 per trip
☐ Yes. Up to " 2 per trip
☐ Yes. Up to " 5 per trip
18. Would you be willing to pay for a demand responsive pick up service from different areas of the Tividabo mountain to the closest rail or metro station?
☐ No, never
☐ Yes. Up to " 1 per trip
☐ Yes. Up to " 2 per trip
☐ Yes. Up to " 5 per trip
19. Do you usually use public transport?
☐ yes ☐ no
20. Are you aware of the ongoing restructuring of the Barcelona urban bus network?
☐ yes ☐ no
21. Are you aware of the %Neighborhood Bus+service offered by TMB
☐ yes ☐ no
- If subject answered "Car" in question 15, ask questions 22.a, 23, 24 and 25**
- 23.a Why did you use your car to access the %passeig de les aigües+?
☐ No optimal alternative available
☐ Better comfort and convenience
☐ Because of the availability of parking free-of-charge
☐ Others
24. Where did you park?
☐ Parking (plaça de la Mireia, Pla dels Maduixers, Valldaura, Coll de la Ventosa, etc)
☐ In the road hard shoulder
☐ In the street in the closes neighborhood
☐ Other. Specify
25. Do you usually find it hard to find available parking space?
☐ No. Never
☐ Yes. Always
☐ Yes. Depending on the time of the day
26. Would you be willing to pay to book a parking space using a smartphone app?

- ☐ No, never
- ☐ Yes. Up to " 1
- ☐ Yes. Up to " 2
- ☐ Yes. Up to " 5

If subject answered “Walk” in question 15, ask questions 23.b

23.b Why did you walk to access %pa passeig de les aigües+:

- ☐ To do sport
- ☐ No optimal alternative available
- ☐ Other

12.3 QUESTIONNAIRES FOR CASE STUDY 5 SURVEY- FUTURE INTERURBAN PUBLIC TRANSPORT IN WARMINSKO-MAZURSKIE VOIVODSHIP

12.3.1 Quantitative survey

P1. Sex	
1. <input type="checkbox"/> Man	2. <input type="checkbox"/> Woman
P2. Age	
1. <input type="checkbox"/> 15 to 18	3. <input type="checkbox"/> 30 to 45
2. <input type="checkbox"/> 19 to 29	4. <input type="checkbox"/> 46 to 60
5. <input type="checkbox"/> over 60	
P3. Education	
1. <input type="checkbox"/> primary	2. <input type="checkbox"/> vocational
3. <input type="checkbox"/> secondary	4. <input type="checkbox"/> higher
P4. Do you live in Szcztyno or surroundings?	
1. <input type="checkbox"/> yes	2. <input type="checkbox"/> no
P5. Frequency of usage public bus transport:	
1. <input type="checkbox"/> daily, return trip	5. <input type="checkbox"/> once per week
2. <input type="checkbox"/> daily / one-way trip	6. <input type="checkbox"/> once per two weeks
3. <input type="checkbox"/> all working days	7. <input type="checkbox"/> once per month
4. <input type="checkbox"/> only weekends	8. <input type="checkbox"/> occasionally how?.....
P6. What is the average distance flown one-way by bus?	
1. <input type="checkbox"/> locally	
2. <input type="checkbox"/> to/from Olsztyn	
3. <input type="checkbox"/> more than to/from Olsztyn	
P7. Car ownership	
1. <input type="checkbox"/> yes	
2. <input type="checkbox"/> no	
P8. Do you use a car owned by family member?	
1. <input type="checkbox"/> yes	
2. <input type="checkbox"/> no	
P9. Do you use a car as fellow (any kind of car-sharing for common trips to school or to work)?	
1. <input type="checkbox"/> yes	
2. <input type="checkbox"/> no	
P10. If you would have the access to private car will you use it instead of public bus?	
1. <input type="checkbox"/> yes, in at least 75% of current trips	
2. <input type="checkbox"/> yes, in at least 50% of current trips	
3. <input type="checkbox"/> yes, in at least 25% of current trips	
P11. Evaluation of the usefulness of information on bus traffic in real-time (available via Internet / mobile) to save time:	

Response scale of 1-5, where 1 - definitely not, 5 - definitely yes

Mark:

P12. Time (in minutes) potentially saved through the use of monitoring real-time traffic (the question corresponded to only those who found the usefulness of monitoring bus traffic in real-time for 4 or 5 in previous question)

..... minutes

P13. Evaluation of improvements through ICT in public transport in the region:

ICT solution (1)	Evaluate the usefulness for passenger (2)	Evaluation of the willingness to pay? (3)	Acceptable increase of price of the ticket (4)	The effect of the solution on possible modal shift from car to bus (5)
Internet or mobile phone based travel planners	1 <input type="checkbox"/> Useless, 2 <input type="checkbox"/> Little usefulness, 3 <input type="checkbox"/> Rather useful, 4 <input type="checkbox"/> Very useful, 5 <input type="checkbox"/> Necessary	1 <input type="checkbox"/> yes 2 <input type="checkbox"/> no (<i>discard column (4) and move to (5) if you are a car user</i>)	1. <input type="checkbox"/> 1PLN 2. <input type="checkbox"/> 2 PLN 3. <input type="checkbox"/> 5 PLN 4. <input type="checkbox"/> 7 PLN 5. <input type="checkbox"/> 10 PLN 6. <input type="checkbox"/> over 10 PLN	1 <input type="checkbox"/> definitely not, 2 <input type="checkbox"/> rather not 3 <input type="checkbox"/> sometimes 4 <input type="checkbox"/> probably yes 5 <input type="checkbox"/> definitely yes
Electronic real-time information at bus stops	1 <input type="checkbox"/> Useless, 2 <input type="checkbox"/> Little usefulness, 3 <input type="checkbox"/> Rather useful, 4 <input type="checkbox"/> Very useful, 5 <input type="checkbox"/> Necessary	1 <input type="checkbox"/> yes 2 <input type="checkbox"/> no (<i>discard column (4) and move to (5) if you are a car user</i>)	1. <input type="checkbox"/> 1PLN 2. <input type="checkbox"/> 2 PLN 3. <input type="checkbox"/> 5 PLN 4. <input type="checkbox"/> 7 PLN 5. <input type="checkbox"/> 10 PLN 6. <input type="checkbox"/> over 10 PLN	1 <input type="checkbox"/> definitely not, 2 <input type="checkbox"/> rather not 3 <input type="checkbox"/> sometimes 4 <input type="checkbox"/> probably yes 5 <input type="checkbox"/> definitely yes
Ticket purchasing via mobile phone/internet	1 <input type="checkbox"/> Useless, 2 <input type="checkbox"/> Little usefulness, 3 <input type="checkbox"/> Rather useful, 4 <input type="checkbox"/> Very useful, 5 <input type="checkbox"/> Necessary	1 <input type="checkbox"/> yes 2 <input type="checkbox"/> no (<i>discard column (4) and move to (5) if you are a car user</i>)	1. <input type="checkbox"/> 1PLN 2. <input type="checkbox"/> 2 PLN 3. <input type="checkbox"/> 5 PLN 4. <input type="checkbox"/> 7 PLN 5. <input type="checkbox"/> 10 PLN 6. <input type="checkbox"/> over 10 PLN	1 <input type="checkbox"/> definitely not, 2 <input type="checkbox"/> rather not 3 <input type="checkbox"/> sometimes 4 <input type="checkbox"/> probably yes 5 <input type="checkbox"/> definitely yes
Real-time information on services via mobile phone/internet	1 <input type="checkbox"/> Useless, 2 <input type="checkbox"/> Little usefulness, 3 <input type="checkbox"/> Rather useful, 4 <input type="checkbox"/> Very useful, 5 <input type="checkbox"/> Necessary	1 <input type="checkbox"/> yes 2 <input type="checkbox"/> no (<i>discard column (4) and move to (5) if you are a car user</i>)	1. <input type="checkbox"/> 1PLN 2. <input type="checkbox"/> 2 PLN 3. <input type="checkbox"/> 5 PLN 4. <input type="checkbox"/> 7 PLN 5. <input type="checkbox"/> 10 PLN 6. <input type="checkbox"/> over 10 PLN	1 <input type="checkbox"/> definitely not, 2 <input type="checkbox"/> rather not 3 <input type="checkbox"/> sometimes 4 <input type="checkbox"/> probably yes 5 <input type="checkbox"/> definitely yes
Real-time information on services on-board of vehicles	1 <input type="checkbox"/> Useless, 2 <input type="checkbox"/> Little usefulness, 3 <input type="checkbox"/> Rather useful, 4 <input type="checkbox"/> Very useful, 5 <input type="checkbox"/> Necessary	1 <input type="checkbox"/> yes 2 <input type="checkbox"/> no (<i>discard column (4) and move to (5) if you are a car user</i>)	1. <input type="checkbox"/> 1PLN 2. <input type="checkbox"/> 2 PLN 3. <input type="checkbox"/> 5 PLN 4. <input type="checkbox"/> 7 PLN 5. <input type="checkbox"/> 10 PLN 6. <input type="checkbox"/> over 10 PLN	1 <input type="checkbox"/> definitely not, 2 <input type="checkbox"/> rather not 3 <input type="checkbox"/> sometimes 4 <input type="checkbox"/> probably yes 5 <input type="checkbox"/> definitely yes
Demand responsive services - possibility for direct pick- up/delivery of passengers in response to prior demand	1 <input type="checkbox"/> Useless, 2 <input type="checkbox"/> Little usefulness, 3 <input type="checkbox"/> Rather useful, 4 <input type="checkbox"/> Very useful, 5 <input type="checkbox"/> Necessary	1 <input type="checkbox"/> yes 2 <input type="checkbox"/> no (<i>discard column (4) and move to (5) if you are a car user</i>)	1. <input type="checkbox"/> 1PLN 2. <input type="checkbox"/> 2 PLN 3. <input type="checkbox"/> 5 PLN 4. <input type="checkbox"/> 7 PLN 5. <input type="checkbox"/> 10 PLN 6. <input type="checkbox"/> over 10 PLN	1 <input type="checkbox"/> definitely not, 2 <input type="checkbox"/> rather not 3 <input type="checkbox"/> sometimes 4 <input type="checkbox"/> probably yes 5 <input type="checkbox"/> definitely yes

12.3.2 Qualitative survey – focus groups

Drivers:

Scenario for bus operator employees (drivers) in-depth focus group research (timing: 90 minutes)

Part 1 – 15 minutes Use of public transport in the area
<ul style="list-style-type: none"> • How long are You employed as a driver/ On which routes? • What are the positive aspects of Your Job? • What are the negative aspects of Your Job? What problems arise in daily bus company operations in this area? • Do You use public transport as passenger if yes/no why? • Have You Got Access to the private car If yes when do You use it?
Part 2 – 60 minutes Evaluation of Compass proposed solutions
<ul style="list-style-type: none"> • Please express Your opinion about proposed ICTs? Are they useful from the passenger / bus operator (and Your as a driver) perspectives? • Will You use it as passenger? Will you welcome them as bus driver? • Do You expect high interest on the part of passengers in those ICTs? If yes/no why? • Which of the current problems of bus transport will be solved by introduction of those ICTs? Are they helpful to passengers/drivers? • Can those ICTs if introduced be a cause for different problems? Problems of which type and for whom? • What barriers can You identify in the use of those ICTs? Are there any ways to remove those barriers? • What operational problems from the company (and Your as a driver) perspective do You expect Chile introducing those ICTs? Does it impact rote selection, driver working hours, driver night rest etc. • What might be the technical problems with those ICTs? Especially are the currently used vehicles capable of operating with ICT equipment? Is the purchase of new/modern vehicles necessary? • Are You as a driver ready to operate New ICT tools (for instance can You participate in information transmitting) Do You expect that All ICTs will work automatically without the need for driver intervention? • Do you have any suggestions which might help to optimise/ further develop proposed ICTs? • If the access to the ICT was based on fares, how much do You think passengers should be charged extra? How the payment should be made (in ticket price, other non-compulsory mechanism?) • Are there any features of proposed ICTs which while helpful to passengers are additional burden to the drivers? • Are there any other than proposed improvements which You would like to propose?
Part 3 – 15 minutes Future of the public transport
<ul style="list-style-type: none"> • There are transport users who never use public transport. What are the reasons in Your opinion. Are there any ways to change their behaviour? • What are the expected by You future changes in public transport? • What is the optimal model of public transport? • Do You expect that public transport given certain changes could become very popular among transport users? If yes please explain why?

Passengers:

Scenario for passenger in-depth focus group research (timing: 90 minutes)

<p align="center">Part 1 – 15 minutes Use of public transport in the area</p> <ul style="list-style-type: none"> • Which modes of public transport do You use? • How often do You use public transport? Using which modes? On which routes? How much time it takes? • Can You use any alternative to public transport? • If yes please explain of what type, especially do You have Access to private car (own it, is owned by another member of family, is available on request from someone else?) • If alternative exist in which situations You select public transport over private car? • If alternative does not exist . Could like to have it? In that case would You still use public transport? If yes than in which circumstances? •
<p align="center">Part 2 – 60 minutes Evaluation of Compass proposed solutions</p> <ul style="list-style-type: none"> • Please express Your opinion about proposed ICTs? Are they useful from the passenger perspectives? • Will You use them if introduced?? • What is the expected interest of other passengers in Your opinion? Please explain why do You think so? • Which of the current problems of bus transport will be solved by introduction of those ICTs? Are they helpful to passengers/drivers? • Can those ICTs if introduced be a cause for different problems? Problems of which type and for whom? • What barriers can You identify in the use of those ICTs? Are there any ways to remove those barriers? Please make a ranking of identified barriers. • Do you have any suggestions which might help to optimise/ further develop proposed ICTs? • Assuming that access to the proposed ICTs comes with the fee. How much are You willing to pay for them? What is the optimal method of payment (included in ticket price, other . e.g. non-compulsory method?) • Which of the proposed ICTs could make You to resign from the use of private car. Please rank proposed ICTs in this regard. • Are there any other than proposed improvements which You would like to propose which could make public transport more user friendly, more efficient and which will make public transport more attractive option as compared to private car? •
<p align="center">Part 3 – 15 minutes Future of public transport</p> <ul style="list-style-type: none"> • There are transport users who never use public transport. What are the reasons in Your opinion. Are there any ways to change their behaviour? • What are the expected by You future changes in public transport? • What is the optimal model of public transport? • Do You expect that public transport given certain changes could become very popular among transport users? If yes please explain why?

12.4 QUESTIONNAIRES FOR CASE STUDY 8 SURVEY – BIKE-SHARING IN VIENNA AND THE SURROUNDING REGION

Question ID	Questions	
1.	Gender <ul style="list-style-type: none"> ➤ Male; ➤ Female. 	
2.	Age <ul style="list-style-type: none"> ➤ < 15; ➤ 16 . 20; ➤ 21 . 25; ➤ 26 . 40; ➤ 41 . 60; ➤ 61 . 75; ➤ > 75. 	
3.	How many persons, including you, are constantly living in your household? <ul style="list-style-type: none"> ➤ 1; ➤ 2; ➤ 3; ➤ 4; ➤ 5 or more; ➤ n/a. 	
4.	What is your highest degree of school education? <ul style="list-style-type: none"> ➤ No compulsory school; ➤ Compulsory school; ➤ Apprenticeship; ➤ Vocational school; ➤ Job- or technique-oriented university entrance qualification (%BHS/HTL+); ➤ General university entrance qualification (%MHS+); ➤ University degree; ➤ n/a. 	
5.	Do you own a bicycle? <ul style="list-style-type: none"> ➤ Yes; ➤ No. 	
6.	If answer is “Yes”: If “Yes” how often do you use your in your everyday life? <ul style="list-style-type: none"> ➤ Daily; ➤ Several times a week; ➤ Weekly; ➤ Monthly; ➤ Quarterly; ➤ Rarer than quarterly; ➤ Never; ➤ n/a. 	If answer is “No”: GO TO QUESTION 8.
7.	If answer is “Yes”: How often do you use your bike in your leisure time? <ul style="list-style-type: none"> ➤ Daily; ➤ Several times a week; ➤ Weekly; ➤ Monthly; ➤ Quarterly; ➤ Rarer than quarterly; ➤ Never; ➤ n/a. 	
8.	Do you know bike-sharing? <ul style="list-style-type: none"> ➤ Yes; 	

	➤ No.
9.	Do you know any other bike-sharing schemes? <ul style="list-style-type: none"> ➤ Citybike (Vienna); ➤ Nextbike (Burgenland); ➤ Call a bike (Germany); ➤ Other (please specify).
10.	Have you ever used bike-sharing? <ul style="list-style-type: none"> ➤ Yes; ➤ No; ➤ n/a.
<p>THE FOLLOWING QUESTIONS ARE DEPENDING ON THE ANSWERS GIVEN AT QUESTION 8 AND 10 ON THIS PAGE.</p>	

If the answers (on the first page) to questions 8 and 10 are both “Yes” and “Yes”:

1.	Where do you know bike-sharing from? <ul style="list-style-type: none"> ➤ Word-of-mouth; ➤ Advertisement; ➤ Internet; ➤ I saw it operating; ➤ n/a; ➤ Other (please specify).
2.	How often do you use bike-sharing? <ul style="list-style-type: none"> ➤ Daily; ➤ Several times a week; ➤ Weekly; ➤ Monthly; ➤ Quarterly; ➤ Rarer than quarterly; ➤ Never; ➤ n/a.
3.	For which trip purposes do you use bike-sharing? <ul style="list-style-type: none"> ➤ Flat; ➤ Workplace; ➤ Education; ➤ Leisure time; ➤ Tourism; ➤ n/a; ➤ Other (please specify).
4.	Why do you use bike-sharing? <ul style="list-style-type: none"> ➤ It is faster than other means of transport; ➤ It is more ecologically friendly; ➤ It is healthier; ➤ It is cheaper; ➤ It is fun; ➤ It is the only possibility; ➤ n/a; ➤ Other (please specify).
5.	What is your opinion about bike-sharing? <ul style="list-style-type: none"> ➤ Very good; ➤ Good; ➤ Somewhat good; ➤ Not good; ➤ Do not know; ➤ n/a.
6.	Which points related to bike-sharing can be further improved? <ul style="list-style-type: none"> ➤ Number of rental stations: [Yes; No] ➤ State of the bikes: [Yes; No] ➤ Distribution area: [Yes; No] ➤ Availability of bikes: [Yes; No] ➤ Visibility of rental stations: [Yes; No] ➤ Renting process: [Yes; No] ➤ Accessibility: [Yes; No] ➤ Other (please specify).
7.	Which identification method do you prefer? <ul style="list-style-type: none"> ➤ Bank card; ➤ Credit card; ➤ Designated user card for bike-sharing;

	<ul style="list-style-type: none"> ➤ SMS; ➤ Telephone call; ➤ Personal lending; ➤ n/a. 		
8.	Would it be acceptable if you have to pay for bike-sharing? <ul style="list-style-type: none"> ➤ Yes; ➤ No. 		
9.	<table border="0" style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> If “Yes”, how much would you be willing to pay? <ul style="list-style-type: none"> ➤ 0 ”/h; ➤ 0,50 ”/h; ➤ 1 ”/h; ➤ 1,50 ”/h; ➤ 2 ”/h; ➤ 2,50 ”/h; ➤ 3 ”/h. </td><td style="width: 50%; vertical-align: top;"> If answer is “No”: <p style="text-align: center;">GO TO QUESTION 11.</p> </td></tr> </table>	If “Yes”, how much would you be willing to pay? <ul style="list-style-type: none"> ➤ 0 ”/h; ➤ 0,50 ”/h; ➤ 1 ”/h; ➤ 1,50 ”/h; ➤ 2 ”/h; ➤ 2,50 ”/h; ➤ 3 ”/h. 	If answer is “No”: <p style="text-align: center;">GO TO QUESTION 11.</p>
If “Yes”, how much would you be willing to pay? <ul style="list-style-type: none"> ➤ 0 ”/h; ➤ 0,50 ”/h; ➤ 1 ”/h; ➤ 1,50 ”/h; ➤ 2 ”/h; ➤ 2,50 ”/h; ➤ 3 ”/h. 	If answer is “No”: <p style="text-align: center;">GO TO QUESTION 11.</p>		
10.	<table border="0" style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> If “Yes”, which payment method would you prefer? <ul style="list-style-type: none"> ➤ Direct debit; ➤ Credit card; ➤ Voucher; ➤ Cash; ➤ Other (please specify); ➤ n/a. </td><td style="width: 50%;"></td></tr> </table>	If “Yes”, which payment method would you prefer? <ul style="list-style-type: none"> ➤ Direct debit; ➤ Credit card; ➤ Voucher; ➤ Cash; ➤ Other (please specify); ➤ n/a. 	
If “Yes”, which payment method would you prefer? <ul style="list-style-type: none"> ➤ Direct debit; ➤ Credit card; ➤ Voucher; ➤ Cash; ➤ Other (please specify); ➤ n/a. 			
11.	What is the distance from your residence to the next rental station? <ul style="list-style-type: none"> ➤ 0-200 m (0-4 min); ➤ 200-400 m (4-8 min); ➤ 400-600 m (8-12 min); ➤ 600-800 m (12-16 min); ➤ > 800 Meter (>16 min). 		
12.	What is the distance from your workplace to the next rental station? <ul style="list-style-type: none"> ➤ 0-200 m (0-4 min); ➤ 200-400 m (4-8 min); ➤ 400-600 m (8-12 min); ➤ 600-800 m (12-16 min); ➤ > 800 Meter (>16 min). 		
13.	Do you think more rental stations are needed? <ul style="list-style-type: none"> ➤ Yes; ➤ No. 		
14.	<table border="0" style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> If “Yes”, where? </td><td style="width: 50%; vertical-align: top;"> If answer is “No”: <p style="text-align: center;">END OF SURVEY.</p> </td></tr> </table>	If “Yes”, where?	If answer is “No”: <p style="text-align: center;">END OF SURVEY.</p>
If “Yes”, where?	If answer is “No”: <p style="text-align: center;">END OF SURVEY.</p>		
END OF SURVEY.			

If the answer (on the first page) to question 8 is “Yes” and to question 10 “No”:

1.	Where do you know bike-sharing from? <ul style="list-style-type: none"> ➤ Word-of-mouth; ➤ Advertisement; ➤ Internet; ➤ I saw it operating; ➤ n/a; ➤ Other (please specify).
2.	What is your opinion about bike-sharing? <ul style="list-style-type: none"> ➤ Very good; ➤ Good; ➤ Somewhat good; ➤ Not good; ➤ Do not know; ➤ n/a.
3.	What is the main reason for you not to use bike-sharing? <ul style="list-style-type: none"> ➤ Weather; ➤ Too far away from my residence;

	<ul style="list-style-type: none"> ➤ State of the bikes; ➤ Process of lending takes too long; ➤ My trips are too long; ➤ Too far away from my educational or workplace; ➤ Type of bikes; ➤ Riding a bike is a too slowly way of movement; ➤ Other (please specify). 	
4.	Under which circumstances would you use bike-sharing? <ul style="list-style-type: none"> ➤ More densely network of rental stations; ➤ Easier way of booking the bikes; ➤ Better bikes; ➤ Under no circumstances; ➤ n/a; ➤ Other (please specify). 	
5.	How close should the next rental station ideally be to your residence? <ul style="list-style-type: none"> ➤ 0-200 m (0-4 min); ➤ 200-400 m (4-8 min); ➤ 400-600 m (8-12 min); ➤ 600-800 m (12-16 min); ➤ > 800 Meter (>16 min). 	
6.	How close should the next rental station ideally be to your workplace? <ul style="list-style-type: none"> ➤ 0-200 m (0-4 min); ➤ 200-400 m (4-8 min); ➤ 400-600 m (8-12 min); ➤ 600-800 m (12-16 min); ➤ > 800 Meter (>16 min). 	
7.	Which identification systems do you prefer? <ul style="list-style-type: none"> ➤ Bank card; ➤ Credit card; ➤ Designated user card for bike-sharing; ➤ SMS; ➤ Telephone call; ➤ Personal lending; ➤ n/a. 	
8.	If all such requirements were fulfilled, would it be acceptable if you have to pay for bike-sharing? <ul style="list-style-type: none"> ➤ Yes; ➤ No. 	
9.	If “Yes”, how much money would you be willing to pay? <ul style="list-style-type: none"> ➤ 0 ” /h; ➤ 0,50 ” /h; ➤ 1 ” /h; ➤ 1,50 ” /h; ➤ 2 ” /h; ➤ 2,50 ” /h; ➤ 3 ” /h. 	If answer is “No”: <p style="text-align: center;">END OF SURVEY.</p>
10.	If “Yes”, which method of payment would you prefer? <ul style="list-style-type: none"> ➤ Direct debit; ➤ Credit card; ➤ Voucher; ➤ Cash; ➤ Other (please specify); ➤ n/a. 	
END OF SURVEY.		

If the answer (on the first page) to question 8 is “No” and to question 10 “n/a”:

1.	Under which circumstances would you use bike-sharing? <ul style="list-style-type: none"> ➤ More densely network of rental stations; ➤ Easier way of booking the bikes; ➤ Better bikes; ➤ Under no circumstances; ➤ n/a; ➤ Other (please specify). 	
2.	How close should the next rental station ideally be to your residence? <ul style="list-style-type: none"> ➤ 0-200 m (0-4 min); ➤ 200-400 m (4-8 min); ➤ 400-600 m (8-12 min); ➤ 600-800 m (12-16 min); ➤ > 800 Meter (>16 min). 	
3.	How close should the next rental station ideally be to your workplace? <ul style="list-style-type: none"> ➤ 0-200 m (0-4 min); ➤ 200-400 m (4-8 min); ➤ 400-600 m (8-12 min); ➤ 600-800 m (12-16 min); ➤ > 800 Meter (>16 min). 	
4.	Which identification system do you prefer? <ul style="list-style-type: none"> ➤ Bank card; ➤ Credit card; ➤ Designated user card for bike-sharing; ➤ SMS; ➤ Telephone call; ➤ Personal lending; ➤ n/a. 	
5.	If all such requirements were fulfilled, would it be acceptable if you have to pay for bike-sharing? <ul style="list-style-type: none"> ➤ Yes; ➤ No. 	
6.	If “Yes”, how much money would you be willing to pay? <ul style="list-style-type: none"> ➤ 0 ” /h; ➤ 0,50 ” /h; ➤ 1 ” /h; ➤ 1,50 ” /h; ➤ 2 ” /h; ➤ 2,50 ” /h; ➤ 3 ” /h. 	If answer is “No”: <p style="text-align: center;">END OF SURVEY.</p>
7.	If “Yes”, which method of payment would you prefer? <ul style="list-style-type: none"> ➤ Direct debit; ➤ Credit card; ➤ Voucher; ➤ Cash; ➤ Other (please specify); ➤ n/a. 	
END OF SURVEY.		

12.5 QUESTIONNAIRES FOR CASE STUDY 10 SURVEY - GRASS-ROOT COOPERATIVE SMARTPHONE BASED CAR SHARING

12.5.1 Focus Group Interview

Focus-group – interviews: main questions

1) Motivation for private car-sharing & first experiences:

- Where or how have you heard about CARUSO?
- Did you have experiences with car-sharing or rideshare opportunities before?
- Why did you join the car-sharing group?
- Where there any concerns in the beginning?
- What did your family or friends think about car-sharing?
- How did your car-sharing group form?
- What is the size and structure of your car-sharing group?

2) CARUSO in everyday life – changes in driving behaviour:

- For which purposes do you use the car-sharing car?
- How often do you use the car-sharing car?
- Do you drive alone or with passengers on board? If you drive with passengers on board, who are they (family or not family members?)
- How did your driving behaviour change since you are using car-sharing?
- Are there any changes related to the use of public transport?
- What about the distance from your residence to the car-sharing vehicle . does the distance influence the frequency of usage?
- Which alternative do you choose when the car-sharing car is not available?

3) Advantages and disadvantages of sharing a car:

- What are the advantages of sharing a car?
- What are the disadvantages of sharing a car?
- Are there any barriers?
- What is working very well, what is not? Why?
- What are your experiences with the electric car?
- Does your community have any special features based on which car-sharing can operate successfully?

4) Satisfaction with the overall system:

How satisfied are you withō

- The booking system;
- The costs;
- The availability of the car-sharing cars;
- The condition of the cars (e.g. cleanliness);
- The distance to the car-sharing car; etc.

Are there any improvement suggestions?

Is there anything left that you want to say?

12.5.2 On-line survey for users

Question ID	Questions
➤ 1.	➤ Since when are you doing car-sharing? ➤ [Number of month]
➤ 2.	➤ How many persons are in your car-sharing-group? (Private persons, associations,...) ➤ [Number of persons: 1; 2; 3; 4; 5; 6; 7; ... 40; More than 40; Don't know.]
➤ 3.	➤ What was your motivation for car-sharing? Please rate each statement:


	<ul style="list-style-type: none"> ➤ An own car is too expensive. ➤ [%Totally agree+; %Agree+; %Less agree+; %Do not agree at all+; %Do not know+] ➤ A car's insurance, fuel and maintenance costs are too expensive. ➤ [%Totally agree+; %Agree+; %Less agree+; %Do not agree at all+; %Do not know+] ➤ I need a car only occasionally. ➤ [%Totally agree+; %Agree+; %Less agree+; %Do not agree at all+; %Do not know+] ➤ Environmental thoughts were an important factor. ➤ [%Totally agree+; %Agree+; %Less agree+; %Do not agree at all+; %Do not know+] ➤ Friends of mine are doing car-sharing too. ➤ [%Totally agree+; %Agree+; %Less agree+; %Do not agree at all+; %Do not know+] ➤ Sharing a car is more functional than owning one. ➤ [%Totally agree+; %Agree+; %Less agree+; %Do not agree at all+; %Do not know+] ➤ The type of car was essential for me (e.g. e-car, van,...). ➤ [%Totally agree+; %Agree+; %Less agree+; %Do not agree at all+; %Do not know+] ➤ Because it is an innovative form of mobility. ➤ [%Totally agree+; %Agree+; %Less agree+; %Do not agree at all+; %Do not know+] ➤ Because the municipality is providing it. ➤ [%Totally agree+; %Agree+; %Less agree+; %Do not agree at all+; %Do not know+] ➤ Because it is a great system for sharing a car within the family. ➤ [%Totally agree+; %Agree+; %Less agree+; %Do not agree at all+; %Do not know+] 	
➤ 4.	<ul style="list-style-type: none"> ➤ How often do you use a car-sharing vehicle? <ul style="list-style-type: none"> ➤ Daily; ➤ Several times a week; ➤ Weekly; ➤ Monthly, ➤ Rarely. 	
➤ 5.	<ul style="list-style-type: none"> ➤ If answer is "Rarely": ➤ Why do you use the car-sharing vehicle rarely? (Multiple answers possible): <ul style="list-style-type: none"> ➤ The costs are too high. ➤ Distance to the car-sharing car is too long. ➤ I have an own car. ➤ I use the car-sharing vehicle only for special purposes. ➤ The booking system is too complicated. ➤ The accounting system is too complicated. ➤ The hand-over of keys is too complicated. ➤ I need a car very rarely. ➤ I tested the system but it does not match my mobility behaviour. ➤ I am using public transport. ➤ I need this special type of car (e.g. transporter) very rarely. ➤ Other (please specify). 	<ul style="list-style-type: none"> ➤ All the other answers: ➤ <ul style="list-style-type: none"> ➤ GO TO QUESTION 6.
➤ 6.	<ul style="list-style-type: none"> ➤ Please describe your car situation before car-sharing and now: <ul style="list-style-type: none"> ➤ I did not own a vehicle before, but now I am doing car-sharing. ➤ I sold my own vehicle and now I am doing car-sharing. ➤ I own a vehicle which I am sharing with others now. 	

	<ul style="list-style-type: none"> ➤ I own a vehicle and use the car-sharing vehicle additionally. ➤ Other (please specify).
➤ 7.	<ul style="list-style-type: none"> ➤ Is there a car available in your household? Please choose a statement which describes your situation the best: <ul style="list-style-type: none"> ➤ Yes, I own the car and it is mainly used by me. ➤ Yes, I own the car and it is mainly used by another person in the family. ➤ Yes, a family member owns the car and it is used almost evenly by the family member. ➤ Yes, a family member owns the car and it is mainly used by me. ➤ Yes, a family member owns the car and it is mainly used by somebody else in the family. ➤ No, in my household there is no car available. ➤ Other (please specify).
➤ 8.	<ul style="list-style-type: none"> ➤ Which statement fits to you the best? <ul style="list-style-type: none"> ➤ I use the car-sharing vehicle mostly alone without passengers on board. ➤ I use the car-sharing vehicle mostly with one passenger on board. ➤ I use the car-sharing vehicle mostly with two or three passengers on board.
➤ 9.	<ul style="list-style-type: none"> ➤ Do you pool with non-family members? If yes, how often? <ul style="list-style-type: none"> ➤ Never; ➤ Once in a year or less; ➤ Two to three times a year; ➤ Once in a month; ➤ Once in a week; ➤ Several times a week.
➤ 10.	<ul style="list-style-type: none"> ➤ Please recall your last car-sharing usage: How many persons (incl. driver) were in the car? <ul style="list-style-type: none"> ➤ [Number of persons: 1; 2; 3; 4; 5; More; I have not used the car-sharing vehicle so far; Do not know.]
➤ 11.	<ul style="list-style-type: none"> ➤ Please recall the weekday of your last car-sharing usage: <ul style="list-style-type: none"> ➤ [Weekday: During the week; Weekend/feasts; I have not used the car-sharing vehicle so far; Do not know.]
➤ 12.	<ul style="list-style-type: none"> ➤ Please recall the time of day of your last car-sharing usage: around what time did you use the car-sharing vehicle? <ul style="list-style-type: none"> ➤ [Time of day: Morning/5-9 a.m.; Late morning/9-12 a.m.; Midday/12-14 p.m.; Afternoon/14-17 p.m.; Evening/17-22 p.m.; Night/22-5 a.m.; I have not used the car-sharing vehicle so far. Do not know.]
➤ 13.	<ul style="list-style-type: none"> ➤ Which total distance (out- and back-trip) did you cover at your last car-sharing usage? <ul style="list-style-type: none"> ➤ [Distance: Up to 5 km; 5-10 km; 10-15 km; 15-20 km; 20-30 km; 30-40 km; 40-50 km; More than 50 km; I have not used the car-sharing vehicle so far. Do not know.]
➤ 14.	<ul style="list-style-type: none"> ➤ How much luggage/shopping/delivery did you transport at your last car-sharing usage? <ul style="list-style-type: none"> ➤ [Kg: 0-5 kg; 5-10 kg; 10-20 kg; 20-30 kg; More; I have not used the car-sharing vehicle so far. Do not know.]
➤ 15.	<ul style="list-style-type: none"> ➤ What was the main purpose of your last car-sharing usage? <ul style="list-style-type: none"> ➤ Commuting; ➤ Education; ➤ Shopping; ➤ Business trip; ➤ Private purpose; ➤ Leisure time; ➤ Weekend trip (up to 3 days); ➤ Vacation (more than 3 days); ➤ Picking up of persons (e.g. from train station);

	<ul style="list-style-type: none"> ➤ I have not used the car-sharing vehicle so far; ➤ Other (please specify).
➤ 16.	<ul style="list-style-type: none"> ➤ Please recall your second last car-sharing usage: How many persons (incl. driver) were in the car? ➤ [Number of persons: 1; 2; 3; 4; 5; More; I have not used the car-sharing vehicle so far; Do not know.]
➤ 17.	<ul style="list-style-type: none"> ➤ Please recall the weekday of your second last car-sharing usage: ➤ [Weekday: During the week; Weekend/feasts; I have not used the car-sharing vehicle so far; Do not know.]
➤ 18.	<ul style="list-style-type: none"> ➤ Please recall the time of day of your second last car-sharing usage: around what time did you use the car-sharing vehicle? ➤ [Time of day: Morning/5-9 a.m.; Late morning/9-12 a.m.; Midday/12-14 p.m.; Afternoon/14-17 p.m.; Evening/17-22 p.m.; Night/22-5 a.m.; I have not used the car-sharing vehicle so far. Do not know.]
➤ 19.	<ul style="list-style-type: none"> ➤ Which total distance (out- and back-trip) did you cover at your second last car-sharing usage? ➤ [Distance: Up to 5 km; 5-10 km; 10-15 km; 15-20 km; 20-30 km; 30-40 km; 40-50 km; More than 50 km; I have not used the car-sharing vehicle so far. Do not know.]
➤ 20.	<ul style="list-style-type: none"> ➤ How much luggage/shopping/delivery did you transport at your second last car-sharing usage? ➤ [Kg: 0-5 kg; 5-10 kg; 10-20 kg; 20-30 kg; More; I have not used the car-sharing vehicle so far. Do not know.]
➤ 21.	<ul style="list-style-type: none"> ➤ What was the main purpose of your last car-sharing usage? ➤ Commuting; ➤ Education; ➤ Shopping; ➤ Business trip; ➤ Private purpose; ➤ Leisure time; ➤ Weekend trip (up to 3 days); ➤ Vacation (more than 3 days); ➤ Picking up of persons (e.g. from train station); ➤ I have not used the car-sharing vehicle so far; ➤ Other (please specify).
➤ 22.	<ul style="list-style-type: none"> ➤ How often do you use the car-sharing vehicle in general for the following purposes? ➤ Commuting; ➤ [Daily; Weekly; Monthly; Rarely; Never; %/a+] ➤ Education; ➤ [Daily; Weekly; Monthly; Rarely; Never; %/a+] ➤ Shopping; ➤ [Daily; Weekly; Monthly; Rarely; Never; %/a+] ➤ Business trip; ➤ [Daily; Weekly; Monthly; Rarely; Never; %/a+] ➤ Private purpose; ➤ [Daily; Weekly; Monthly; Rarely; Never; %/a+] ➤ Leisure time; ➤ [Daily; Weekly; Monthly; Rarely; Never; %/a+] ➤ Weekend trip (up to 3 days); ➤ [Daily; Weekly; Monthly; Rarely; Never; %/a+] ➤ Vacation (more than 3 days);

	<ul style="list-style-type: none"> ➤ [Daily; Weekly; Monthly; Rarely; Never; %/a+] ➤ Picking up of persons (e.g. from train station); ➤ [Daily; Weekly; Monthly; Rarely; Never; %/a+] ➤ Other (please specify).
➤ 23.	<ul style="list-style-type: none"> ➤ Do you remember a day where the car-sharing vehicle was not available to you? If yes, which alternative did you choose? ➤ Yes, I went by bicycle. ➤ Yes, I went by motorbike. ➤ Yes, I went by car (as driver). ➤ Yes, I went by car (as passenger). ➤ Yes, I went by Taxi. ➤ Yes, I went by bus. ➤ Yes, I went by train. ➤ Yes, I stayed at home. ➤ Yes, I put off my journey. ➤ No, the car-sharing vehicle was always available until now. ➤ Other (please specify).
➤ 24.	<ul style="list-style-type: none"> ➤ How satisfied are you in general with... ➤ ... the availability of the car-sharing vehicles; ➤ [Very satisfied; Satisfied; Less satisfied; Not satisfied; Don't know+] ➤ ... the users costs of the car-sharing vehicles; ➤ [Very satisfied; Satisfied; Less satisfied; Not satisfied; Don't know+] ➤ ... the payment method for the car-sharing vehicles; ➤ [Very satisfied; Satisfied; Less satisfied; Not satisfied; Don't know+] ➤ ... the process of hand-over of the car-sharing vehicle keys; ➤ [Very satisfied; Satisfied; Less satisfied; Not satisfied; Don't know+] ➤ ... the condition of the car-sharing vehicles (e.g. cleanliness); ➤ [Very satisfied; Satisfied; Less satisfied; Not satisfied; Don't know+] ➤ ... the technical condition of the car-sharing vehicles; ➤ [Very satisfied; Satisfied; Less satisfied; Not satisfied; Don't know+] ➤ ... the location of the car-sharing vehicles; ➤ [Very satisfied; Satisfied; Less satisfied; Not satisfied; Don't know+] ➤ ... the handover of the car-sharing vehicles; ➤ [Very satisfied; Satisfied; Less satisfied; Not satisfied; Don't know+] ➤ Other (please specify).
➤ 25.	<ul style="list-style-type: none"> ➤ If you are less or not satisfied with one or more statements, please give reasons: ➤
➤ 26.	<ul style="list-style-type: none"> ➤ How often do you use other car-sharing-models than CARUSO? ➤ Conventional car-sharing (e.g. car-sharing.at, mobility.ch); ➤ [Very often; Often; Sometimes; Rarely; Very rarely; Never; %/a+] ➤ Flexible car-sharing (e.g. car2go); ➤ [Very often; Often; Sometimes; Rarely; Very rarely; Never; %/a+] ➤ Carpooling/ride-sharing (e.g. mitfahrgelegenheit.at); ➤ [Very often; Often; Sometimes; Rarely; Very rarely; Never; %/a+] ➤ Car rental (e.g. Europcar); ➤ [Very often; Often; Sometimes; Rarely; Very rarely; Never; %/a+] ➤ Other (please specify).
➤ 27.	<ul style="list-style-type: none"> ➤ What changed since you started car-sharing? Please rate the following statements: ➤ Now I'm making fewer single trips.

	<ul style="list-style-type: none"> ➤ [%Totally agree+; %Agree+; %Less agree+; %Do not agree at all+; %Do not know+.] ➤ Now I consciously choose the means of transport according to my trip purpose. ➤ [%Totally agree+; %Agree+; %Less agree+; %Do not agree at all+; %Do not know+.] ➤ Now I am driving with more passengers on board than before. ➤ [%Totally agree+; %Agree+; %Less agree+; %Do not agree at all+; %Do not know+.] ➤ Now I spend more money for my mobility than before. ➤ [%Totally agree+; %Agree+; %Less agree+; %Do not agree at all+; %Do not know+.] ➤ Now I am more socially connected than before. ➤ [%Totally agree+; %Agree+; %Less agree+; %Do not agree at all+; %Do not know+.] ➤ Now I have better access to services, shopping, cultural activities, etc. outside of my residence. ➤ [%Totally agree+; %Agree+; %Less agree+; %Do not agree at all+; %Do not know+.] ➤ Now I am more flexible than before. ➤ [%Totally agree+; %Agree+; %Less agree+; %Do not agree at all+; %Do not know+.] ➤ Other (please specify).
➤ 28.	<ul style="list-style-type: none"> ➤ What changed since you started car-sharing? Please rate the following statements: ➤ Car usage; ➤ [%More frequent than before+; %Same usage+; %Less frequent than before+; %n/a+.] ➤ Usage of public transport; ➤ [%More frequent than before+; %Same usage+; %Less frequent than before+; %n/a+.] ➤ Combination of public transport and car; ➤ [%More frequent than before+; %Same usage+; %Less frequent than before+; %n/a+.] ➤ On-line travel planning; ➤ [%More frequent than before+; %Same usage+; %Less frequent than before+; %n/a+.] ➤ Other (please specify).
➤ 29.	<ul style="list-style-type: none"> ➤ Are there some other issues you would like to point out? ➤
➤ 30.	<ul style="list-style-type: none"> ➤ How many persons are constantly living in your household? ➤ Under 6 years; ➤ [Number of persons: 0; 1; 2; 3; 4; 5; 6; More; n/a.] ➤ 7 . 17 years; ➤ [Number of persons: 0; 1; 2; 3; 4; 5; 6; More; n/a.] ➤ Over 18 years. ➤ [Number of persons: 0; 1; 2; 3; 4; 5; 6; More; n/a.]
➤ 31.	<ul style="list-style-type: none"> ➤ How many vehicles in a roadworthy condition are available at your household? ➤ Car; ➤ [Number: 0; 1; 2; 3; 4; 5; More.] ➤ Motorbike; ➤ [Number: 0; 1; 2; 3; 4; 5; More.] ➤ Bicycle; ➤ [Number: 0; 1; 2; 3; 4; 5; More.] ➤ Scooter. ➤ [Number: 0; 1; 2; 3; 4; 5; More.]

➤ 32.	➤ Do you own a car? ➤ Yes; ➤ No.		
➤ 33.	➤ If answer is “Yes”: ➤ If yes, how often do you use your vehicle? ➤ Daily; ➤ Several times a week; ➤ At least once a week; ➤ Several times a month; ➤ At least once a month; ➤ Less than monthly; ➤ Never.	➤ If answer is “No”: ➤ If you do not own a car, do you have another car available (from relatives/friends)? ➤ Yes, very often; ➤ Yes, sometimes; ➤ No. ➤ 	
➤ 34.	➤ Which engine type does your car have? ➤ Petrol; ➤ Diesel; ➤ Electronic; ➤ Hybrid.	➤ If answer is “Yes, very often” or “Yes, sometimes”: ➤ If you have another car available, what is the generally preferred choice, the car-sharing or the other vehicle? ➤ Car-sharing vehicle; ➤ Other vehicle. ➤ GO TO QUESTION 37.	➤ If answer is “No”: ➤ GO TO QUESTION 37.
➤ 35.	➤ Which annual mileage do you achieve with your private car? ➤ Less than 5,000 km; ➤ 5,000 . 10,000 km; ➤ 10,000 . 15,000 km; ➤ 15,000 . 20,000 km; ➤ More than 20,000 km; ➤ Do not know.		
➤ 36.	➤ At your residence, is there any parking space available? ➤ No; ➤ Garage; ➤ Designated parking space on the street; Other (please specify). ➤ GO TO QUESTION 37.		
➤ 37.	➤ Do you have public transport available at your residence? ➤ Yes; ➤ No.		
➤ 38.	➤ How often do you use public transport in general (at your residence and outside)?		

	<ul style="list-style-type: none"> ➤ Daily; ➤ Several times a week; ➤ At least once a week; ➤ Several times a month; ➤ At least once a month; ➤ Once a month or less; ➤ Never. 	
➤ 39.	<ul style="list-style-type: none"> ➤ If answer is “Once a month or less” or “Never”: ➤ Why do you use public transport once a month or less or never? Please rate the following statements: <ul style="list-style-type: none"> ➤ Using public transport takes too much time. <input type="checkbox"/> [Totally agree+; <input type="checkbox"/> Agree+; <input type="checkbox"/> Less agree+; <input type="checkbox"/> Do not agree at all+; <input type="checkbox"/> Do not know+.] ➤ There is no station near my home. <input type="checkbox"/> [Totally agree+; <input type="checkbox"/> Agree+; <input type="checkbox"/> Less agree+; <input type="checkbox"/> Do not agree at all+; <input type="checkbox"/> Do not know+.] ➤ There is no station near my workplace. <input type="checkbox"/> [Totally agree+; <input type="checkbox"/> Agree+; <input type="checkbox"/> Less agree+; <input type="checkbox"/> Do not agree at all+; <input type="checkbox"/> Do not know+.] ➤ The schedule does not fit for me. <input type="checkbox"/> [Totally agree+; <input type="checkbox"/> Agree+; <input type="checkbox"/> Less agree+; <input type="checkbox"/> Do not agree at all+; <input type="checkbox"/> Do not know+.] ➤ The schedule is ok, but the public transport does not go to my destination. <input type="checkbox"/> [Totally agree+; <input type="checkbox"/> Agree+; <input type="checkbox"/> Less agree+; <input type="checkbox"/> Do not agree at all+; <input type="checkbox"/> Do not know+.] ➤ I don't have information about the timetable. <input type="checkbox"/> [Totally agree+; <input type="checkbox"/> Agree+; <input type="checkbox"/> Less agree+; <input type="checkbox"/> Do not agree at all+; <input type="checkbox"/> Do not know+.] ➤ I am more flexible with my car. <input type="checkbox"/> [Totally agree+; <input type="checkbox"/> Agree+; <input type="checkbox"/> Less agree+; <input type="checkbox"/> Do not agree at all+; <input type="checkbox"/> Do not know+.] ➤ The fare system is too complicated. <input type="checkbox"/> [Totally agree+; <input type="checkbox"/> Agree+; <input type="checkbox"/> Less agree+; <input type="checkbox"/> Do not agree at all+; <input type="checkbox"/> Do not know+.] ➤ There are accessible parking spaces at my place of destination. <input type="checkbox"/> [Totally agree+; <input type="checkbox"/> Agree+; <input type="checkbox"/> Less agree+; <input type="checkbox"/> Do not agree at all+; <input type="checkbox"/> Do not know+.] ➤ Public transport is too expensive. <input type="checkbox"/> [Totally agree+; <input type="checkbox"/> Agree+; <input type="checkbox"/> Less agree+; <input type="checkbox"/> Do not agree at all+; <input type="checkbox"/> Do not know+.] ➤ Other (please specify). 	<ul style="list-style-type: none"> ➤ All the other answers: ➤ GO TO QUESTION 40.
➤ 40.	<ul style="list-style-type: none"> ➤ Do you own a monthly/seasonal ticket for public transport? <ul style="list-style-type: none"> ➤ No; ➤ Monthly ticket; ➤ Annual ticket; ➤ Other (please specify). 	
➤ 41.	<ul style="list-style-type: none"> ➤ Do you own other concession cards for public transport? <ul style="list-style-type: none"> ➤ No; ➤ ÖBB Vorteilscard (annual discount card for Austrian Federal Railway); ➤ ÖBB Familycard (annual discount card for Austrian Federal Railway); 	

	<ul style="list-style-type: none"> ➤ Student discount; ➤ Senior discount; ➤ Other (please specify). 	
➤ 42.	<ul style="list-style-type: none"> ➤ What is the walking distance from your doorstep to...? <ul style="list-style-type: none"> ➤ ...the next public transport station; <ul style="list-style-type: none"> ➤ [Meter: %0 . 20 m+, %20 . 50 m+, %50 . 100 m+, %100 . 200 m+, %200 . 300 m+, %300 . 600 m+, %600 . 1000 m+, %1 . 2 km+, %Not accessible on foot+, %Do not know+] ➤ [Minutes: %0 1 min+, %2 min+, %3 min+, %4 . 5 min+, %6 . 7 min+, %7 . 10 min+, %10 . 15 min+, %15 . 30 min+, %Not accessible on foot+, %Do not know+] ➤ ...your private car; <ul style="list-style-type: none"> ➤ [Meter: %0 . 20 m+, %20 . 50 m+, %50 . 100 m+, %100 . 200 m+, %200 . 300 m+, %300 . 600 m+, %600 . 1000 m+, %1 . 2 km+, %Not accessible on foot+, %Do not know+] ➤ [Minutes: %0 1 min+, %2 min+, %3 min+, %4 . 5 min+, %6 . 7 min+, %7 . 10 min+, %10 . 15 min+, %15 . 30 min+, %Not accessible on foot+, %Do not know+] ➤ ...the car-sharing vehicle. <ul style="list-style-type: none"> ➤ [Meter: %0 . 20 m+, %20 . 50 m+, %50 . 100 m+, %100 . 200 m+, %200 . 300 m+, %300 . 600 m+, %600 . 1000 m+, %1 . 2 km+, %Not accessible on foot+, %Do not know+] ➤ [Minutes: %0 1 min+, %2 min+, %3 min+, %4 . 5 min+, %6 . 7 min+, %7 . 10 min+, %10 . 15 min+, %15 . 30 min+, %Not accessible on foot+, %Do not know+] 	
➤ 43.	<ul style="list-style-type: none"> ➤ Gender: <ul style="list-style-type: none"> ➤ Male; ➤ Female. 	
➤ 44.	<ul style="list-style-type: none"> ➤ How old are you? <ul style="list-style-type: none"> ➤ [Age groups: %8 . 20 years+, %21 . 25 years+, %26 . 30 years+... until %71 . 75 years+, %Over 76 years+, %n/a+] 	
➤ 45.	<ul style="list-style-type: none"> ➤ Highest degree of school education: <ul style="list-style-type: none"> ➤ Compulsory school; ➤ Apprenticeship; ➤ Vocational school; ➤ University entrance qualification; ➤ University degree; ➤ n/a; ➤ Other (please specify). 	
➤ 46.	<ul style="list-style-type: none"> ➤ What is your current occupation? <ul style="list-style-type: none"> ➤ Employed full-time; ➤ Employed part-time; ➤ Currently unemployed; ➤ Currently in vocational training; ➤ Currently in higher education; ➤ Military or civil service; ➤ Housewife/-husband; ➤ Retired; ➤ n/a; ➤ Other (please specify). 	
➤ 47.	<ul style="list-style-type: none"> ➤ If answer is “Employed full-time” or “Employed part-time”: ➤ Which employment status do you have? <ul style="list-style-type: none"> ➤ Non-office worker; ➤ Office worker; ➤ Civil servant; 	<ul style="list-style-type: none"> ➤ All the other answers: <ul style="list-style-type: none"> ➤ ➤ GO TO QUESTION 48. ➤

	<ul style="list-style-type: none"> ➤ Farmer; ➤ Self-employed worker; ➤ Family worker; ➤ n/a; ➤ Other (please specify). 	
➤ 48.	<ul style="list-style-type: none"> ➤ How many inhabitants does your community/city have? <ul style="list-style-type: none"> ➤ 100 . 1,000; ➤ 1,000 . 10,000; ➤ 10,000 . 50,000; ➤ 50,000 . 100,000; ➤ More than 100,000; ➤ Do not know. 	
➤ 49.	<ul style="list-style-type: none"> ➤ How do you assess the location of your flat/house? <ul style="list-style-type: none"> ➤ Central/urban; ➤ Suburban; ➤ Rural area; ➤ Remote; ➤ Do not know. 	
➤ 50.	<ul style="list-style-type: none"> ➤ In your opinion, how experienced are you in handling the Internet in general? (E-banking, on-line-shopping, hotel bookings, etc.). <ul style="list-style-type: none"> ➤ Very experienced; ➤ Experienced; ➤ Somewhat experienced; ➤ Less experienced; ➤ Inexperienced; ➤ n/a. 	
➤ 51.	<ul style="list-style-type: none"> ➤ Do you use on-line travel planners? If yes, which one do you use? (Multiple answers possible): <ul style="list-style-type: none"> ➤ None; ➤ Google Maps; ➤ AnachB; ➤ ÖBB Scotty; ➤ Michelin; ➤ ÖAMTC; ➤ Other (please specify). 	
➤ 52.	<ul style="list-style-type: none"> ➤ Do you have one of the following devices (with Internet access)? <ul style="list-style-type: none"> ➤ Smartphone; ➤ [Yes; No.] ➤ Tablet (e.g. iPad); ➤ [Yes; No.] ➤ Laptop/Desktop PC; ➤ [Yes; No.] ➤ Other (please specify). 	
➤ 53.	<ul style="list-style-type: none"> ➤ On which device do you book the car-sharing vehicle? (Multiple answers possible) <ul style="list-style-type: none"> ➤ Smartphone; ➤ Tablet; ➤ Laptop/Desktop PC; ➤ Other (please specify). 	

➤ 54.	<p>➤ How much money do you spend on average per month for your mobility?</p> <p>➤ Private car: fuel;</p> <p>➤ [%0 Euro+, %0 . 20 Euro+, %20 . 40 Euro+, %40 . 60 Euro+, %60 . 80 Euro+, %80 . 100 Euro+, %100 . 150 Euro+, %150 . 200 Euro+, %More than 200 Euro+, %Do not know+.]</p> <p>➤ Private car: parking;</p> <p>➤ [%0 Euro+, %0 . 20 Euro+, %20 . 40 Euro+, %40 . 60 Euro+, %60 . 80 Euro+, %80 . 100 Euro+, %100 . 150 Euro+, %150 . 200 Euro+, %More than 200 Euro+, %Do not know+.]</p> <p>➤ Public transport;</p> <p>➤ [%0 Euro+, %0 . 20 Euro+, %20 . 40 Euro+, %40 . 60 Euro+, %60 . 80 Euro+, %80 . 100 Euro+, %100 . 150 Euro+, %150 . 200 Euro+, %More than 200 Euro+, %Do not know+.]</p> <p>➤ Car-sharing vehicle;</p> <p>➤ [%0 Euro+, %0 . 20 Euro+, %20 . 40 Euro+, %40 . 60 Euro+, %60 . 80 Euro+, %80 . 100 Euro+, %100 . 150 Euro+, %150 . 200 Euro+, %More than 200 Euro+, %Do not know+.]</p> <p>➤ Other mobility (Taxi, etc.);</p> <p>➤ [%0 Euro+, %0 . 20 Euro+, %20 . 40 Euro+, %40 . 60 Euro+, %60 . 80 Euro+, %80 . 100 Euro+, %100 . 150 Euro+, %150 . 200 Euro+, %More than 200 Euro+, %Do not know+.]</p> <p>➤ Other (please specify).</p>
END OF SURVEY.	

12.5.3 Telephone survey for users and non-users

Question ID	Questions		
1.	Are you familiar with the term “car-sharing”? <ul style="list-style-type: none"> ➤ Yes; ➤ No. 		
2.	If answer is “Yes”: If yes, which car-sharing-provider do you know? (Multiple answers possible) <ul style="list-style-type: none"> ➤ Carsharing.at, zipcar; ➤ Car2go; ➤ Easymotion; ➤ Carsharing 24/7; ➤ CARUSO; ➤ Autoshare.at; ➤ Mobility.ch, ➤ Autolib (Paris); ➤ Deutsche Bahn Flinkster Carsharing; ➤ n/a; ➤ Other (please specify). <p>GO TO QUESTION 4.</p>	If answer is “No”: Brief explanation of the term by the surveyor - if people still do not know the term: Would you be interested in car-sharing in principle? <ul style="list-style-type: none"> ➤ Yes; ➤ No. 	
3.		If answer is “Yes”: If you are interested in car-sharing in principle – how much money would you be willing to spend for it	If answer is “No”: <p>GO TO QUESTION 26.</p>

		per month? [Euro]	
	GO TO QUESTION 26.		
4.	Have you ever used a car-sharing offer or are you a car-sharing member? <ul style="list-style-type: none"> ➤ Yes; ➤ I was a member, but I am not anymore; ➤ No; Other (please specify).		
5.	If answer is "Yes": If yes, which car-sharing offer did you already use? <ul style="list-style-type: none"> ➤ Car2go; ➤ Carsharing 24/7; ➤ Carsharing.at, zipcar; ➤ Easymotion; ➤ CARUSO; ➤ n/a; ➤ Other (please specify). 	If answer is "I was a member, but I'm not anymore": Why are you no car-sharing member anymore? <ul style="list-style-type: none"> ➤ It is too expensive. ➤ Location of the car-sharing vehicle is too far away. ➤ I have an own car. ➤ I use the car-sharing vehicle only for special purposes. ➤ The booking system is too complicated. ➤ The cost accounting system is too complicated. ➤ The hand-over of keys is too complicated. ➤ I tried car-sharing, but it does not fit to my mobility behaviour. ➤ I am using public transport. ➤ I need the special type of car (e.g. van) only very seldom. ➤ n/a. ➤ Other (please specify). 	If answer is "No": If "No", what are the reasons for not using a car-sharing offer so far? <ul style="list-style-type: none"> ➤ It is too expensive. ➤ I own a private car. ➤ I can use another car if I need one. ➤ I do not want to drive with a foreign car. ➤ I am using public transport. ➤ The system is too complicated. ➤ I do not need a car. ➤ I do not have a driving license. ➤ There is no car-sharing offer near my residence. ➤ n/a. ➤ Other (please specify). Do you know somebody who is a car-sharing member? <ul style="list-style-type: none"> ➤ Yes; ➤ No. GO TO QUESTION 21.
	GO TO QUESTION 26.		
6.	Since when are you using car-sharing? Duration of car-sharing usage: years or month:		
7.	Do you own a private car? <ul style="list-style-type: none"> ➤ Yes; ➤ No. 		
8.	If answer is "Yes": GO TO QUESTION 9.	If answer is "No": Is there a person in your household owning a car which you can use if required? <ul style="list-style-type: none"> ➤ Yes; ➤ No. 	

		GO TO QUESTION 11.
9.	Is the car-sharing vehicle your main or second car? <ul style="list-style-type: none"> ➤ Main car; ➤ Second car; ➤ n/a; ➤ Other (please specify). 	
10.	If answer is “Main car”: If the car-sharing vehicle is your main car, did you own a car before and sold it? <ul style="list-style-type: none"> ➤ I did not own a car before and now I am using car-sharing. ➤ I sold my own car and now I use car-sharing. ➤ I own a car which I am sharing with other people now. ➤ I own a car and use car-sharing additionally. ➤ n/a. ➤ Other (please specify). 	All the other answers: GO TO QUESTION 11.
11.	How often do you use a car-sharing vehicle? <ul style="list-style-type: none"> ➤ Daily; ➤ Several times a week; ➤ Weekly; ➤ Monthly, ➤ Rarely; ➤ Never; ➤ n/a; ➤ Other (please specify). 	
12.	All the other answers: GO TO QUESTION 13.	If answer is “Rarely” or “Never”: Why are you using the car-sharing vehicle “Rarely” or “Never”? <ul style="list-style-type: none"> ➤ It is too expensive. ➤ Location of the car-sharing vehicle is too far away. ➤ I have an own car. ➤ I use the car-sharing vehicle only for special purposes. ➤ The booking system is too complicated. ➤ The cost accounting system is too complicated. ➤ The hand-over of keys is too complicated. ➤ I tried car-sharing, but it does not fit to my mobility behaviour. ➤ I am using public transport. ➤ I need the special type of car (e.g. van) only very seldom. ➤ n/a. ➤ Other (please specify). GO TO QUESTION 26.
13.	For which purposes do you use the car-sharing vehicle mainly? <ul style="list-style-type: none"> ➤ Commuting; ➤ Education; ➤ Shopping; ➤ Business trip; ➤ Private purpose; 	

	<ul style="list-style-type: none"> ➤ Leisure time; ➤ Weekend trip (up to 3 days); ➤ Vacation (more than 3 days); ➤ Picking up of persons (e.g. from train station); ➤ Other (please specify). 	
14.	How do you book the car-sharing vehicle? (Multiple answers possible) <ul style="list-style-type: none"> ➤ Telephone (mobile phone, landline); ➤ Mobile Internet (Smartphone, Tablet); ➤ Internet (Laptop/Desktop PC); ➤ n/a; ➤ Other (please specify). 	
15.	Do you use the car-sharing vehicle mainly alone or do you drive with other passengers? <ul style="list-style-type: none"> ➤ I use the car-sharing vehicle mostly alone without passengers on board. ➤ I use the car-sharing vehicle mostly with one passenger on board. ➤ I use the car-sharing vehicle mostly with two or three passengers on board. ➤ n/a. ➤ Other (please specify). 	
16.	Do you also pool with non-family members? If yes, how often? <ul style="list-style-type: none"> ➤ Never; ➤ Once in a year or less; ➤ Two to three times a year; ➤ Once in a month; ➤ Once in a week; ➤ Several times a week; ➤ n/a; ➤ Other (please specify). 	
17.	With which aspects of car-sharing are you very satisfied, with which less?	
18.	With which aspects of car-sharing are you very satisfied, with which less? <ul style="list-style-type: none"> ➤ Availability; [Very satisfied; Satisfied; Somewhat satisfied; less satisfied; Not satisfied; n/a] ➤ Costs; [Very satisfied; Satisfied; Somewhat satisfied; less satisfied; Not satisfied; n/a] ➤ Payment method; [Very satisfied; Satisfied; Somewhat satisfied; less satisfied; Not satisfied; n/a] ➤ Hand-over of keys; [Very satisfied; Satisfied; Somewhat satisfied; less satisfied; Not satisfied; n/a] ➤ Condition of car (e.g. cleanliness) [Very satisfied; Satisfied; 	

	<p>Somewhat satisfied; less satisfied; Not satisfied; n/a</p> <p>➤ Technical condition of car; [Very satisfied; Satisfied; Somewhat satisfied; less satisfied; Not satisfied; n/a]</p> <p>➤ Location of car; [Very satisfied; Satisfied; Somewhat satisfied; less satisfied; Not satisfied; n/a]</p> <p>➤ Hand-over of car-sharing vehicles; [Very satisfied; Satisfied; Somewhat satisfied; less satisfied; Not satisfied; n/a]</p> <p>➤ Other (please specify).</p>	
19.	If you are not satisfied with one or more statements, please give reasons:	
20.	How much money do you spend on average per month for car-sharing? [Euro]	
21.	Do you have one of the following devices (with Internet access)? <p>➤ Smartphone; [Yes; No]</p> <p>➤ Tablet (e.g. iPad); [Yes; No]</p> <p>➤ Laptop/Desktop PC; [Yes; No]</p> <p>➤ Other (please specify).</p>	
22.	In your opinion, how experienced are you in handling the Internet in general? (E-banking, on-line-shopping, hotel bookings, etc.). <p>➤ Very experienced;</p> <p>➤ Experienced;</p> <p>➤ Somewhat experienced;</p> <p>➤ Less experienced;</p> <p>➤ Inexperienced;</p> <p>➤ n/a.</p>	
23.	Do you own a monthly/seasonal ticket for public transport? <p>➤ No;</p> <p>➤ Monthly ticket;</p> <p>➤ Annual ticket;</p> <p>➤ Other (please specify).</p>	
24.	Do you own other concession cards for public transport? <p>➤ No;</p> <p>➤ ÖBB Vorteils card (annual discount card for Austrian Federal Railway);</p> <p>➤ ÖBB Family card (annual discount card for Austrian Federal Railway);</p> <p>➤ Student discount;</p> <p>➤ Senior discount;</p> <p>➤ Other (please specify).</p>	
25.	How often do you use public transport in general? <p>➤ Daily;</p> <p>➤ Several times a week;</p> <p>➤ At least once a week;</p> <p>➤ Several times a month;</p>	

	<ul style="list-style-type: none"> ➤ At least once a month; ➤ Once a month or less; ➤ Never. 	
26.	Gender (is not asked in the telephone survey) <ul style="list-style-type: none"> ➤ Male; ➤ Female. 	
27.	How old are you? [Age groups: %18 . 20 years+, %21 . 25 years+, %26 . 30 years+ ... until %71 . 75 years+, %Over 76 years+, %n/a+]	
28.	Highest degree of school education: <ul style="list-style-type: none"> ➤ Compulsory school; ➤ Apprenticeship; ➤ Vocational school; ➤ University entrance qualification; ➤ University degree; ➤ n/a; ➤ Other (please specify). 	
29.	What is your current occupation? <ul style="list-style-type: none"> ➤ Employed full-time; ➤ Employed part-time; ➤ Currently unemployed; ➤ Currently in vocational training; ➤ Currently in higher education; ➤ Military or civil service; ➤ Housewife/-husband; ➤ Retired; ➤ n/a; ➤ Other (please specify). 	
30.	If answer is “Employed full-time” or “Employed part-time”: Which employment status do you have? <ul style="list-style-type: none"> ➤ Non-office worker; ➤ Office worker; ➤ Civil servant; ➤ Farmer; ➤ Self-employed worker; ➤ Family worker; ➤ n/a; ➤ Other (please specify). 	All the other answers: END OF SURVEY.
	END OF SURVEY.	