

Focus session

A1: Innovations in public transport

16.00–17.30





Modern IT-Solution
helps communicating professionally
to the customer

Gisela Gräfin von Schlieffen
Rhein-Main-Verkehrsverbund, Germany

Turku, 31st May 2022

The Rhein-Main-Verkehrsverbund (est. 1995)



S-Bahn



Regional train

Regional bus



City Bus



RMV product portfolio – Individual tickets



Pupil's Ticket



Tourist Ticket

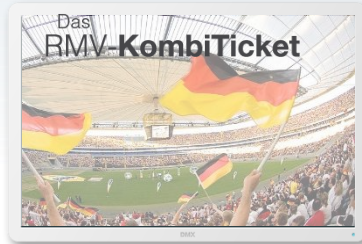


Student Ticket



Senior's Ticket

RMV product portfolio - Major Customer Offerings



Event based
combination tickets

Tenant's ticket



RMV-JobTicket

Public Servants
Ticket

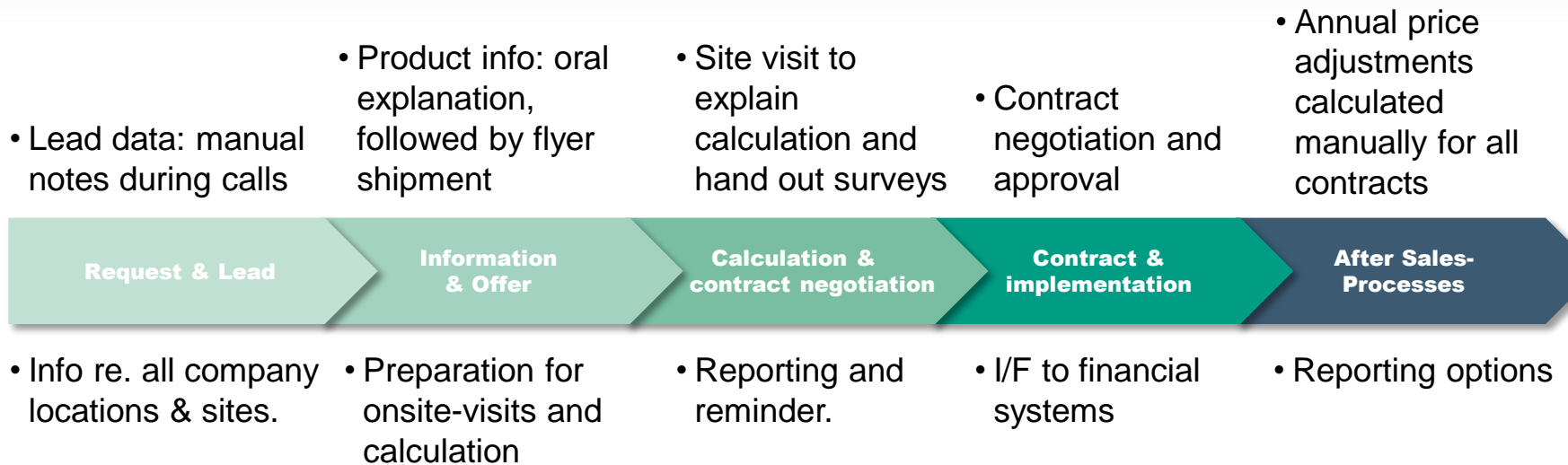


RMV-JobTicket: the RMV product for companies

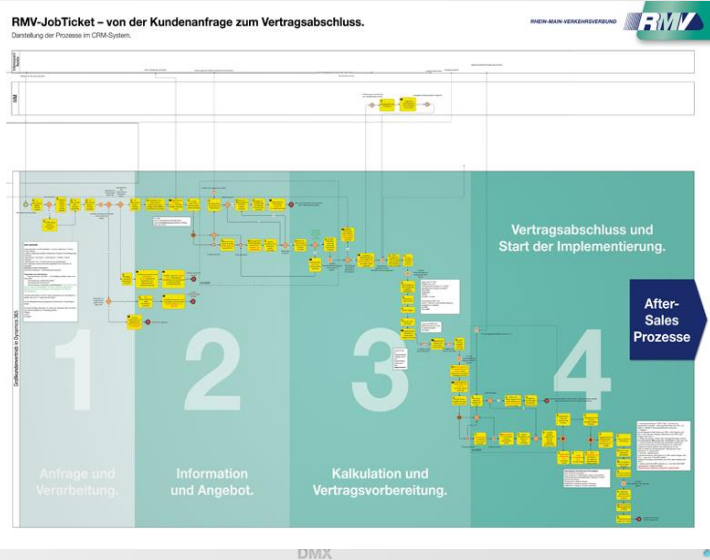


- **Named season ticket** for the employees of companies with more than **50 employees**
- The company has to pay the price for all its employees (solidarity model)

Implementation CRM starts with detailed documentation of the existing sales processes



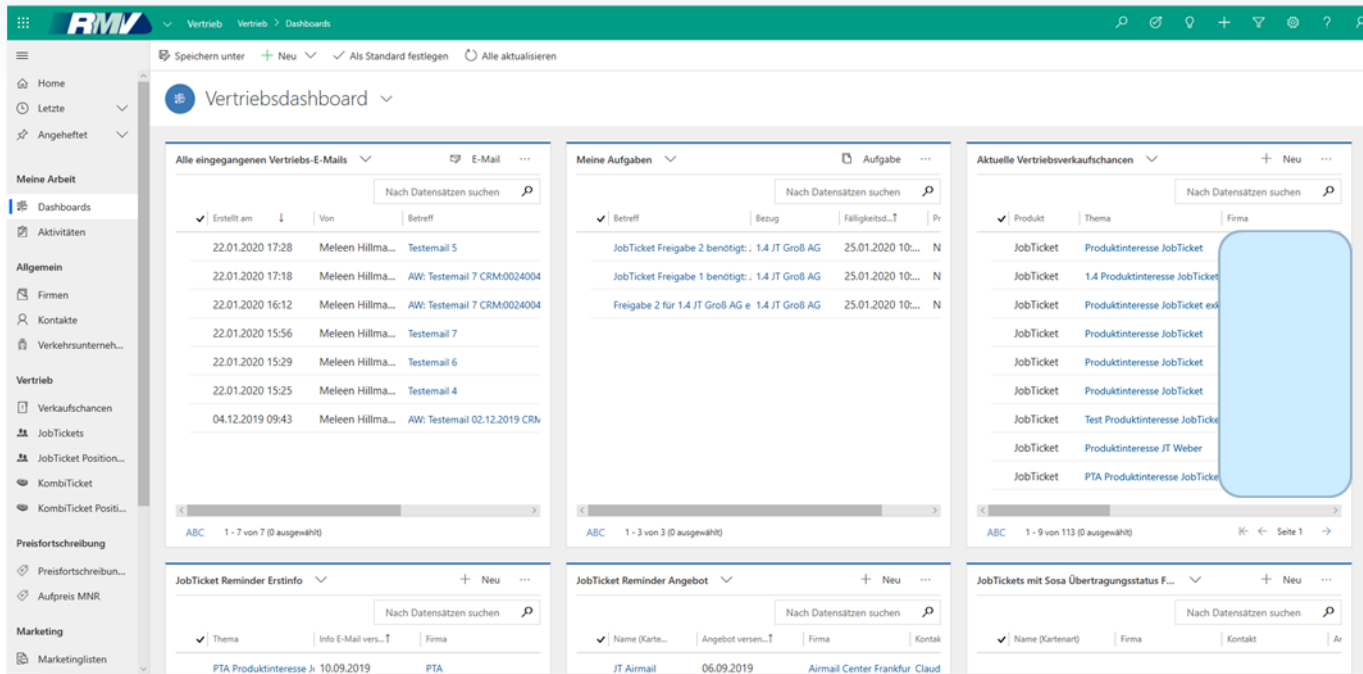
Internal processes were improved prior to implementing the CRM system



- Documentation and analysis of all internal processes in major customer department (BPMN)
- User stories created for use cases (first time we used the SCRUM approach)
- Improvement of existing processes
 - Cooperation with market research
 - Digital format for company surveys
 - Interfaces to backend systems (master data, finance)
- Digital archiving
- Creation of templates for standard communication

Insights MS Dynamics (1)

Sales dashboard – Mails, tasks...



Vertriebsdashboard

Speichern unter: + Neu ✓ Als Standard festlegen ⌚ Alle aktualisieren

Alle eingegangenen Vertriebs-E-Mails

✓	Erstellt am	Von	Betreff
	22.01.2020 17:28	Meleen Hillma...	Testemail 5
	22.01.2020 17:18	Meleen Hillma...	AW: Testemail 7 CRM0024004
	22.01.2020 16:12	Meleen Hillma...	AW: Testemail 7 CRM0024004
	22.01.2020 15:56	Meleen Hillma...	Testemail 7
	22.01.2020 15:29	Meleen Hillma...	Testemail 6
	22.01.2020 15:25	Meleen Hillma...	Testemail 4
	04.12.2019 09:43	Meleen Hillma...	AW: Testemail 02.12.2019 CRh

1 - 7 von 7 (0 ausgewählt)

Meine Aufgaben

✓	Betreff	Bezug	Fälligkeit...	Pr
	JobTicket Freigabe 2 benötigt: 1.4 JT Groß AG		25.01.2020 10:...	N
	JobTicket Freigabe 1 benötigt: 1.4 JT Groß AG		25.01.2020 10:...	N
	Freigabe 2 für 1.4 JT Groß AG e 1.4 JT Groß AG		25.01.2020 10:...	N

1 - 3 von 3 (0 ausgewählt)

Aktuelle Vertriebsverkaufschancen

✓	Produkt	Thema	Firma
	JobTicket	Produktinteresse JobTicket	
	JobTicket	1.4 Produktinteresse JobTicket	
	JobTicket	Produktinteresse JobTicket ex	
	JobTicket	Produktinteresse JobTicket	
	JobTicket	Produktinteresse JobTicket	
	JobTicket	Produktinteresse JobTicket	
	JobTicket	Produktinteresse JobTicket	
	JobTicket	Test Produktinteresse JobTicket	
	JobTicket	Produktinteresse JT Weber	
	JobTicket	PTA Produktinteresse JobTicket	

1 - 9 von 113 (0 ausgewählt) Seite 1

JobTicket Reminder Erstinfo

✓	Thema	Info E-Mail vers...	Firma
	PTA Produktinteresse J	10.09.2019	PTA

JobTicket Reminder Angebot

✓	Name (Karte...	Angebot versen...	Firma	Kontakt
	JT Airmail	06.09.2019	Airmail Center Frankfur	Claud

JobTickets mit Sosa Übertragungsstatus F...

✓	Name (Kartenart)	Firma	Kontakt	Ar
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Insights MS Dynamics (2)

Overview active customers

JobTicket Positionen Aktive JobTicket Positionen

https://rmvtest.com4.dynamics.com/main.aspx?appid=8d25d60a-3f8b-e911-a830-000d3ab09981&pagetype=entitylist&btn=rmv_jobticketpositionen

Diagramm anzeigen + Neu Löschen Aktualisieren Link per E-Mail senden Bericht ausführen Excel-Vorlagen Exportieren nach Excel Aus Excel importieren Ansicht erstellen

Nach Datensätzen suchen

Name (Kartenart)	Sosa Übertrag...	Geändert am	Preis	Gültig ab	Gültig bis	Druckortenschlüssel	Zahlungsmodus	Fahrtkartengruppe	Kartentyp	Ausgabeart
Erfolgreich gese...	05.09.2019 05...	35,71 €	01.01.2016	31.12.2015	17301	monatliche Rechnungsstellung	Jobticket	GRP_vHGS_JobTicket	eTicket_und_P	
Erfolgreich gese...	05.09.2019 05...	38,09 €	01.01.2019	31.12.2019	17301	monatliche Rechnungsstellung	Jobticket	GRP_vHGS_JobTicket	eTicket_und_P	
Erfolgreich gese...	05.09.2019 05...	50,07 €	01.01.2019	31.12.2019	17300	monatliche Rechnungsstellung	Jobticket	GRP_vHGS_JobTicket	eTicket_und_P	
Erfolgreich gese...	05.09.2019 05...	34,13 €	01.01.2019	31.12.2019	17301	monatliche Rechnungsstellung	Jobticket	GRP_vHGS_JobTicket	eTicket_und_P	
Erfolgreich gese...	05.09.2019 05...	46,76 €	01.10.2013	31.12.2013	17300	monatliche Rechnungsstellung	Jobticket	GRP_vHGS_JobTicket	eTicket_und_P	
Erfolgreich gese...	05.09.2019 05...	48,32 €	01.01.2015	31.12.2015	17300	monatliche Rechnungsstellung	Jobticket	GRP_vHGS_JobTicket	eTicket_und_P	
Erfolgreich gese...	05.09.2019 05...	49,17 €	01.01.2016	31.12.2016	17300	monatliche Rechnungsstellung	Jobticket	GRP_vHGS_JobTicket	eTicket_und_P	
Erfolgreich gese...	05.09.2019 05...	53,77 €	01.01.2019	31.12.2019	17300	monatliche Rechnungsstellung	Jobticket	GRP_vHGS_JobTicket	eTicket_und_P	
Erfolgreich gese...	05.09.2019 05...	28,38 €	01.01.2016	31.12.2016	17301	monatliche Rechnungsstellung	Jobticket	GRP_vHGS_JobTicket	eTicket_und_P	
Erfolgreich gese...	05.09.2019 05...	29,89 €	01.01.2014	31.12.2014	17306	monatliche Rechnungsstellung	Jobticket	GRP_vHGS_JobTicket	eTicket_und_P	
Erfolgreich gese...	05.09.2019 05...	33,73 €	01.01.2018	31.12.2018	17306	monatliche Rechnungsstellung	Jobticket	GRP_vHGS_JobTicket	eTicket_und_P	
Erfolgreich gese...	05.09.2019 05...	38,03 €	01.01.2017	31.12.2017	17300	monatliche Rechnungsstellung	Jobticket	GRP_vHGS_JobTicket	eTicket_und_P	
Erfolgreich gese...	05.09.2019 05...	32,11 €	01.01.2016	31.12.2016	17306	monatliche Rechnungsstellung	Jobticket	GRP_vHGS_JobTicket	eTicket_und_P	
Erfolgreich gese...	05.09.2019 05...	37,69 €	01.01.2011	31.12.2011	17301	monatliche Rechnungsstellung	Jobticket	GRP_vHGS_JobTicket	eTicket_und_P	
Erfolgreich gese...	05.09.2019 05...	42,88 €	01.01.2016	31.12.2016	17301	monatliche Rechnungsstellung	Jobticket	GRP_vHGS_JobTicket	eTicket_und_P	
Erfolgreich gese...	05.09.2019 05...	43,53 €	01.01.2017	31.12.2017	17301	monatliche Rechnungsstellung	Jobticket	GRP_vHGS_JobTicket	eTicket_und_P	
Erfolgreich gese...	05.09.2019 05...	38,54 €	01.01.2013	31.01.2013	17301	monatliche Rechnungsstellung	Jobticket	GRP_vHGS_JobTicket	eTicket_und_P	
Erfolgreich gese...	05.09.2019 05...	42,93 €	01.01.2016	31.12.2016	17301	monatliche Rechnungsstellung	Jobticket	GRP_vHGS_JobTicket	eTicket_und_P	
Erfolgreich gese...	05.09.2019 05...	44,44 €	01.01.2018	31.12.2018	17301	monatliche Rechnungsstellung	Jobticket	GRP_vHGS_JobTicket	eTicket_und_P	

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Seite 1

Insights MS Dynamics (3)

Open leads

Verkaufschancen Aktuelle Vertriebsverkaufschancen

Diagramm anzeigen + Neu Aktualisieren Link per E-Mail senden Bericht ausführen Excel-Vorlagen Exportieren nach Excel Aus Excel importieren Dashboards öffnen

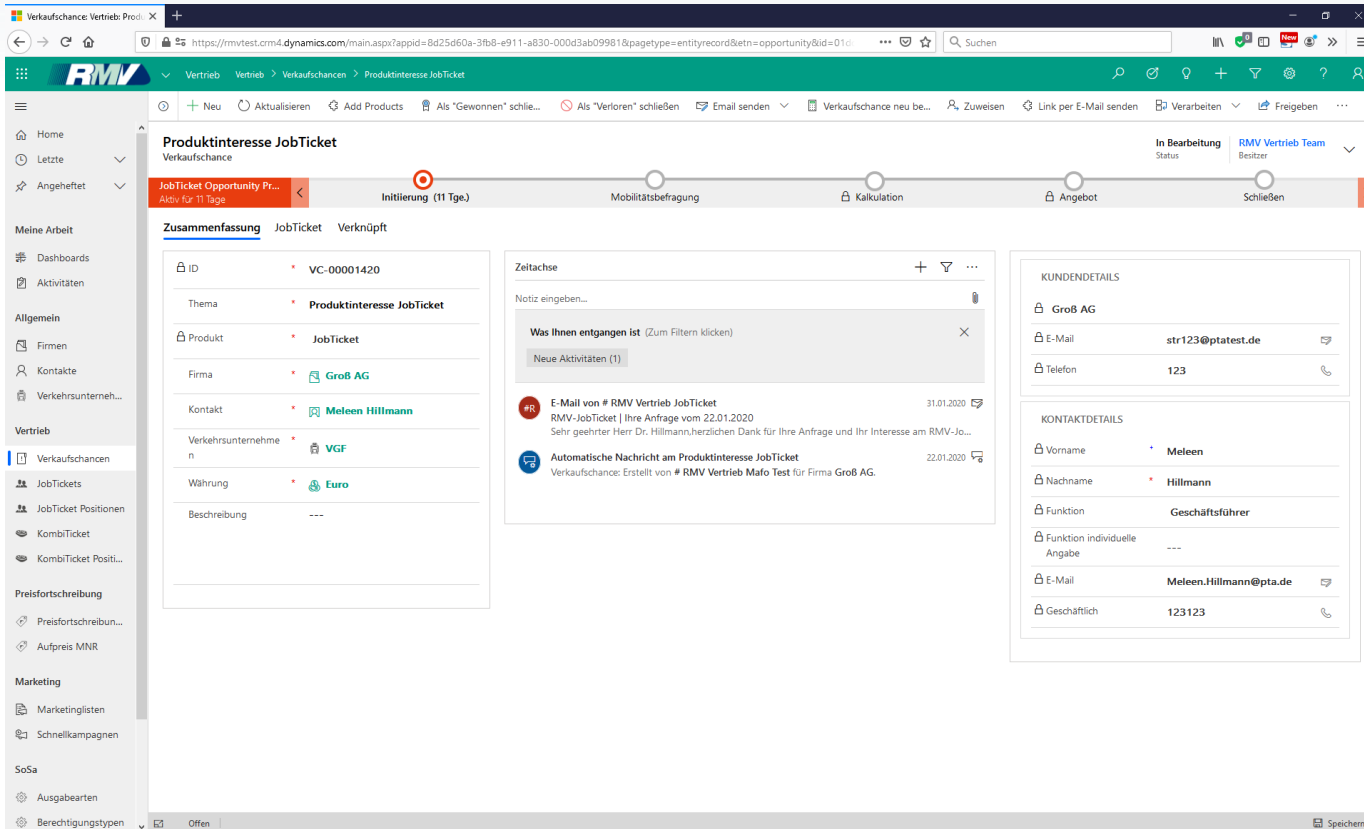
Nach Datensätzen suchen

Produkt	Thema	Firma	Kontakt	Anfragedatum	Status	Statusgrund	Besitzer	ID
JobTicket	Produktinteresse JobTicket			22.01.2020	Offen	In Bearbeitung	RMV Vertrieb Team	VC-00001420
JobTicket	1.4 Produktinteresse JobTicket			17.01.2020	Offen	In Bearbeitung	RMV Vertrieb Team	VC-00001419
JobTicket	Produktinteresse JobTicket exkl. D			12.12.2019	Offen	In Bearbeitung	RMV Vertrieb Team	VC-00001198
JobTicket	Produktinteresse JobTicket			27.11.2019	Offen	In Bearbeitung	RMV Vertrieb Team	VC-00001187
JobTicket	Produktinteresse JobTicket			29.10.2019	Offen	In Bearbeitung	RMV Vertrieb Team	VC-00001167
JobTicket	Produktinteresse JobTicket			22.10.2019	Offen	In Bearbeitung	RMV Vertrieb Team	VC-00001162
JobTicket	Test Produktinteresse JobTicket			20.09.2019	Offen	In Bearbeitung	RMV Vertrieb Team	VC-00001155
JobTicket	Produktinteresse JT Weber			19.09.2019	Offen	In Bearbeitung	RMV Vertrieb Team	VC-00001154
JobTicket	PTA Produktinteresse JobTicket			10.09.2019	Offen	In Bearbeitung	RMV Vertrieb Team	VC-00001151
JobTicket	Produktinteresse JobTicket			09.09.2019	Offen	In Bearbeitung	RMV Vertrieb Team	VC-00001150
JobTicket	Produktinteresse JobTicket			06.09.2019	Offen	In Bearbeitung	RMV Vertrieb Team	VC-00001149
JobTicket	Produktinteresse JobTicket			05.09.2019	Offen	In Bearbeitung	RMV Vertrieb Team	VC-00001147
JobTicket	Produktinteresse JobTicket			05.09.2019	Offen	In Bearbeitung	RMV Vertrieb Team	VC-00001146
JobTicket	Produktinteresse JobTicket			05.09.2019	Offen	In Bearbeitung	RMV Vertrieb Team	VC-00001145
JobTicket	Produktinteresse JobTicket			05.09.2019	Offen	In Bearbeitung	RMV Vertrieb Team	VC-00001144
JobTicket	Produktinteresse JobTicket			05.09.2019	Offen	In Bearbeitung	RMV Vertrieb Team	VC-00001143
JobTicket	Produktinteresse JobTicket			05.09.2019	Offen	In Bearbeitung	RMV Vertrieb Team	VC-00001142
JobTicket	Produktinteresse JobTicket			05.09.2019	Offen	In Bearbeitung	RMV Vertrieb Team	VC-00001141
JobTicket	Produktinteresse JobTicket			05.09.2019	Offen	In Bearbeitung	RMV Vertrieb Team	VC-00001140
JobTicket	Produktinteresse JobTicket			05.09.2019	Offen	In Bearbeitung	RMV Vertrieb Team	VC-00001139

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Insights MS Dynamics (4)

Open leads in detail



The screenshot displays the 'Produktinteresse JobTicket' interface within the RMV system. The top navigation bar includes the RMV logo and a breadcrumb trail: Vertrieb > Verkaufschancen > Produktinteresse JobTicket. Below this, a status bar indicates 'In Bearbeitung' (In Progress) with a 'Status' dropdown and 'RMV Vertrieb Team' as the owner.

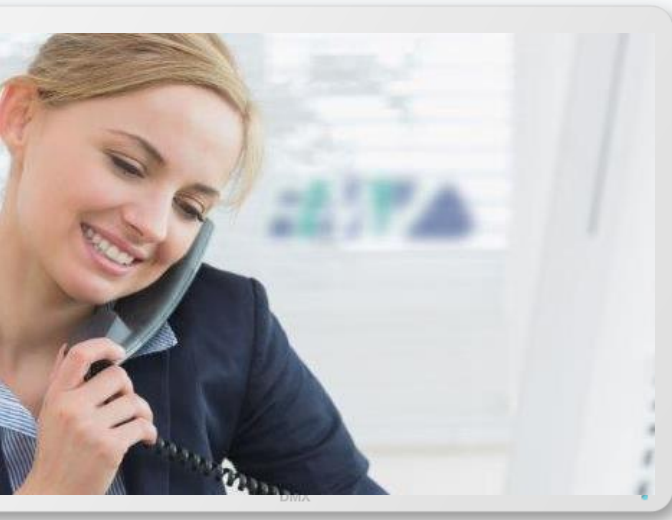
The main content area is divided into several sections:

- Header/Status Bar:** Shows the ticket title 'Produktinteresse JobTicket' and a progress bar with stages: 'Initiierung (11 Tge.)', 'Mobilitätsbefragung', 'Kalkulation', 'Angebot', and 'Schließen'.
- Zusammenfassung (Summary):** A table listing key information:

ID	VC-00001420
Thema	Produktinteresse JobTicket
Produkt	JobTicket
Firma	Groß AG
Kontakt	Meleen Hillmann
Verkehrsunternehmen	VGf
Währung	Euro
Beschreibung	---
- Zeitleiste (Timeline):** A section for 'Neue Aktivitäten (1)' (New Activities (1)) showing two events:
 - E-Mail von # RMV Vertrieb JobTicket:** Dated 31.01.2020, subject: 'RMV-JobTicket | Ihre Anfrage vom 22.01.2020'. Content: 'Sehr geehrter Herr Dr. Hillmann, herzlichen Dank für Ihre Anfrage und Ihr Interesse am RMV-Jo...'.
 - Automatische Nachricht am Produktinteresse JobTicket:** Dated 22.01.2020, subject: 'Verkaufschance: Erstellt von # RMV Vertrieb Mafo Test für Firma Groß AG'.
- KUNDENDETAILS (Customer Details):**
 - Groß AG**
 - E-Mail:** str123@ptatest.de
 - Telefon:** 123
- KONTAKTDETAILS (Contact Details):**
 - Vorname:** Meleen
 - Nachname:** Hillmann
 - Funktion:** Geschäftsführer
 - Funktion individuelle Angabe:** ---
 - E-Mail:** Meleen.Hillmann@pta.de
 - Geschäftlich:** 123123

The left sidebar contains navigation links for 'Meine Arbeit' (My Work), 'Allgemein' (General), 'Vertrieb' (Sales), 'Preisfortschreibung' (Price Adjustment), and 'Marketing'.

CRM project supports the focus on RMV major customers



Objectives:

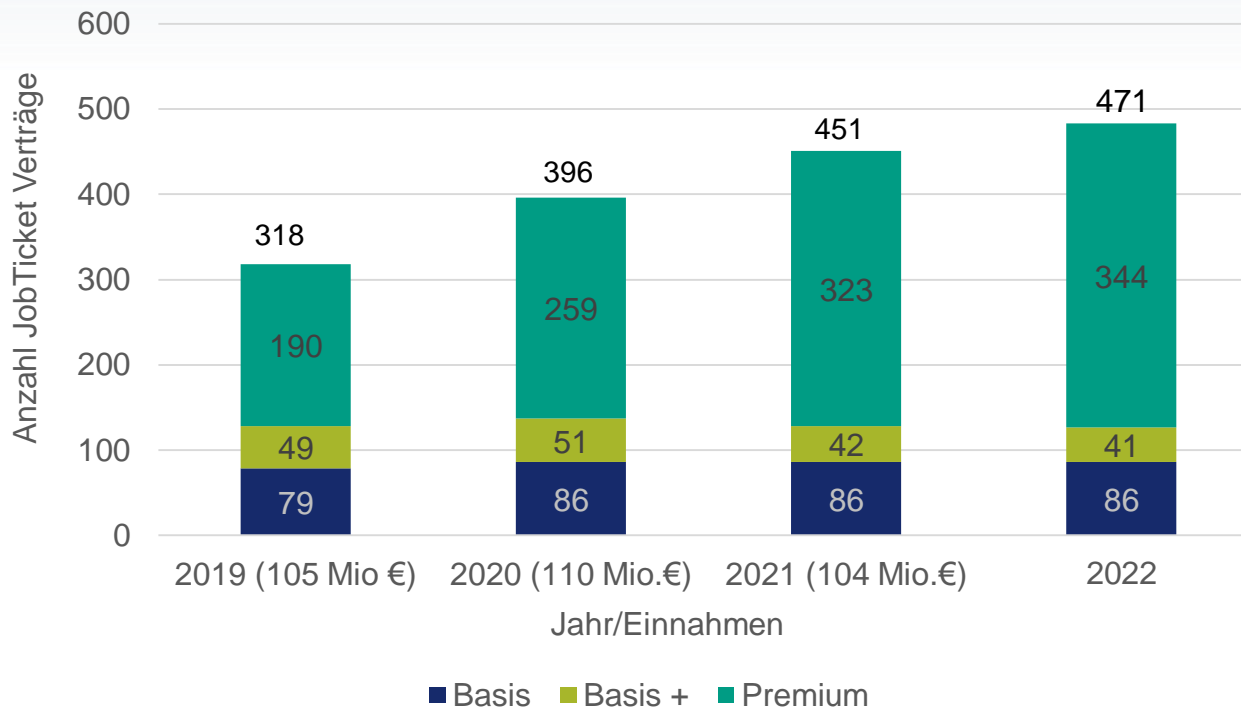
- Improved Planung, Analysis, management, and documentation
- Well structured database
- Foundation for timely and accurate customer communication

Sales advantages:

- Efficient capacity utilisation for sales purposes
- Online access to all relevant data
- Running sales campaigns

RMV-JobTicket: Market development

Development RMV-JobTickets 2019-2022*



of potential users:

2019: ca. 250,000

2020: ca. 270,000

2021: ca. 280,000

*Stand März 2022

After Sales Marketing



Conclusion

A The digital transformation of our sales processes with Microsoft dynamics made our customer communication more professional and gave us in the same time energy to improve our workflow. This will lead to a higher acceptance of the PT system in the RheinMain Region and thereby helps that the ecomobility grows.

NYSSE

**Participating customers to create
better customer experience - Case
Contactless payment and
NysseLab**

Riikka Salkonen
Customer experience manager

NysseLab – creating better customer experience

HOW

NysseLab is a concept that was created to combine customer experience and participation actions. It has goal to create excellent customer service and to participate customer in development of public transportation

WHY

Contactless payment has grown as payment method in Finland during last years. Already in year 2019 it was more popular payment method in stores than paying with card and pincode. Enabling this payment method in public transportation has required major updates in payment systems.

Nysse started Contactless payment implementation project in autumn 2020. During the implementation project, **customer profiles** were utilised. Large scale customer testing was not possible to do due to pandemic but customers were monitored during test use period.

New contactless payment was launched first in one bus line and soon after that in tram test traffic 10.5.2021. After that it was quickly available in all local buses and trams.

Contactless payment covered all vehicles by the end of year 2021 and is one of the main payment methods already. It has proven to be so popular that Nysse will end all cash payments in vehicles until summer 2022.

In September 2021 NysseLab launched a query where customers were asked about their experiences of contactless payment. The aim is to make contactless payment more **easy and attractive** for customers to use.

A blue banner for a survey. On the left, there is an image of a contactless payment terminal with a green checkmark on its screen and a hand holding a card. The text on the banner is in white and blue. The Nysse logo is in the top left. The main text asks for feedback on contactless payment and provides a deadline and a link to the survey.

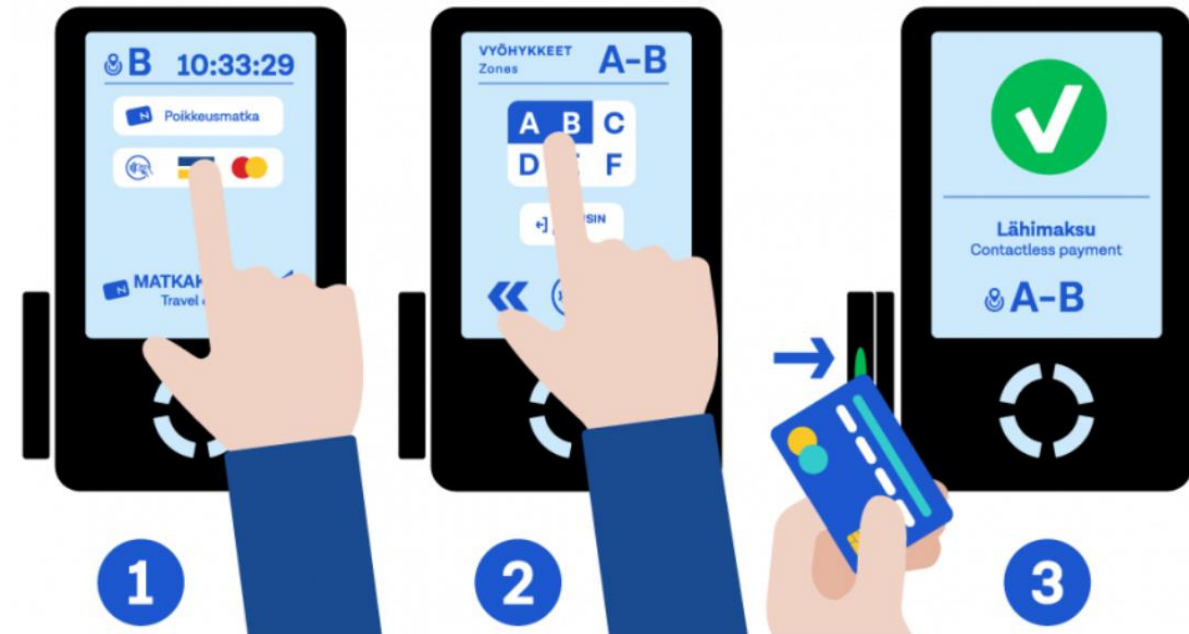
NYSSE Anna äänesi kuulua!

Auta kehittämään lähimaksamista
Nysse-liikenteessä

Vastaa kyselyyn 10.10. mennessä
nysse.fi/kysely

Wanted to find out what kind of contactless payment tickets the customers want?

- customer experience of contactless payment at that moment
- how the payment method should be developed and
- what are the expectations in the future for contactless payment in terms of its functionality and pricing.



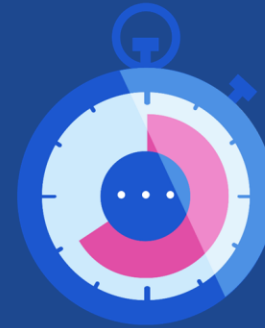
NYSSE

Customer profiles

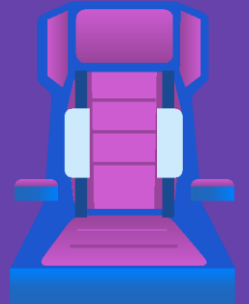
PUBLIC TRANSPORT USERS

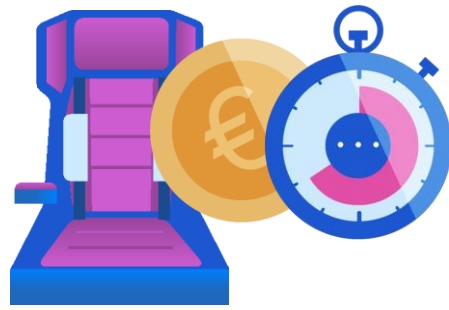
 35 %18 %
SÄÄSTÄJÄ17 %
VASTUUNKANTAJA





PUBLIC & CAR USERS

  41 %19 %
OPTIMOIJAJA23 %
TEHOSTAJA

CAR USERS

 21 %11 %
KRUISAILIJA10%
PAKKO-AUTOILIJA



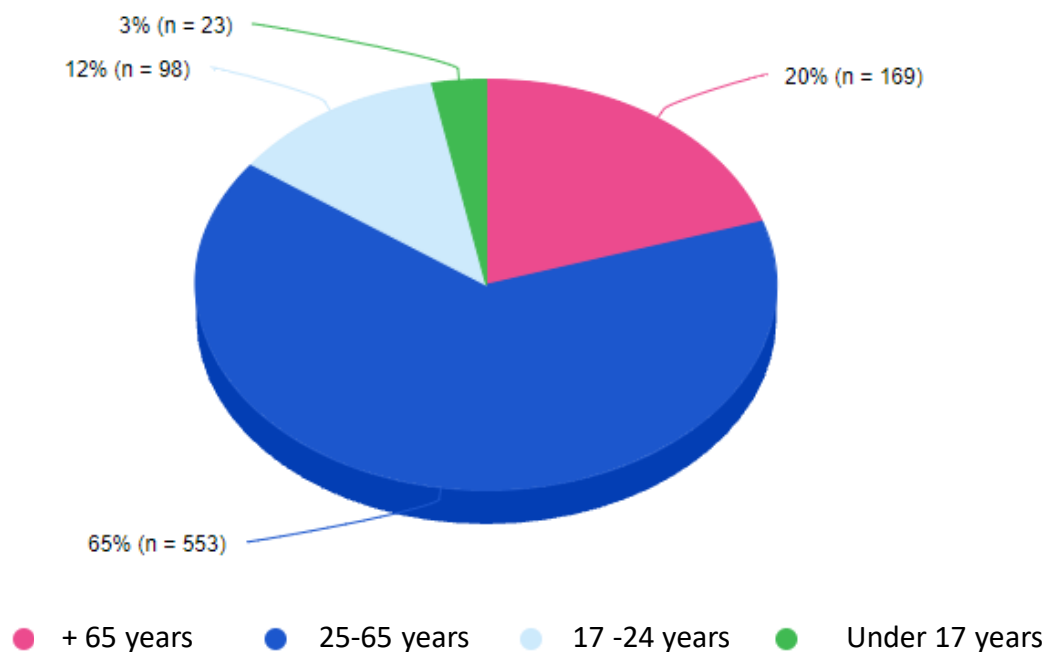
	Customer action at this phase
	HIGHLIGHTS / Positive emotions experienced during this phase
	CHALLENGES and problems experienced in this phase
	DEVELOPMENTS / customer experience challenges and areas for development

NYSSE

Query

Online query 9.9.-10.10.2021

848 responses



NYSSE

Lähimaksun kehittäminen

i Pakolliset kentät merkitään asteriskilla (*) ja ne tulee täyttää lomakkeen lähettämiseksi.

Nyssellä on kevään ja kesän 2021 aikana otettu käyttöön lähimaksaminen uutena maksutapana. Matkan voi maksaa Nysse-liikenteessä lähimaksuominaisuudella varustetulla Visa-, Mastercard- ja Europay-maksukortilla sekä mobiiliompakolla, kuten Apple Pay ja Google Pay. Ensimmäisessä vaiheessa käytössä on 90 minuuttia voimassa oleva lipputuote ja hintakatto, jonka mukaan asiakkaalle lasketaan aina halvin mahdollinen matkan hinta tehtyjen matkojen mukaan.

Uusi maksutapa on vielä alkutaipaleellaan, ja tämän kyselyn avulla Nysse haluaa osallistaa asiakkaitaan uuden maksutavan kehittämisessä.

1. Nysсен palveluiden käyttäminen

Minkä ikäinen olet? *

☐ Yli 65-vuotias

☐ 25-64-vuotias

☐ 17-24-vuotias

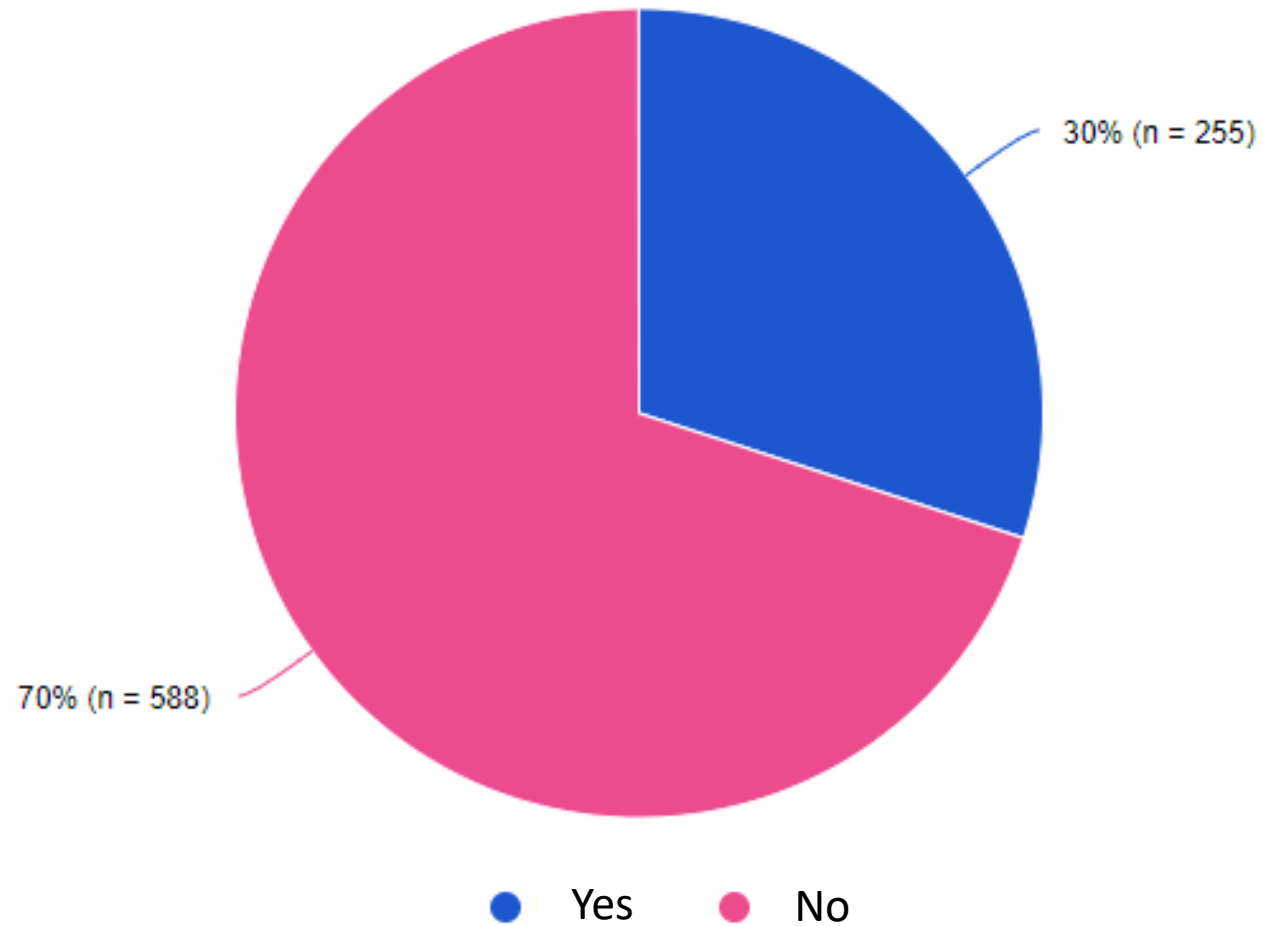
☐ Alle 17-vuotias

Kuinka usein käytät joukkoliikennettä Nysсен kyydissä? *

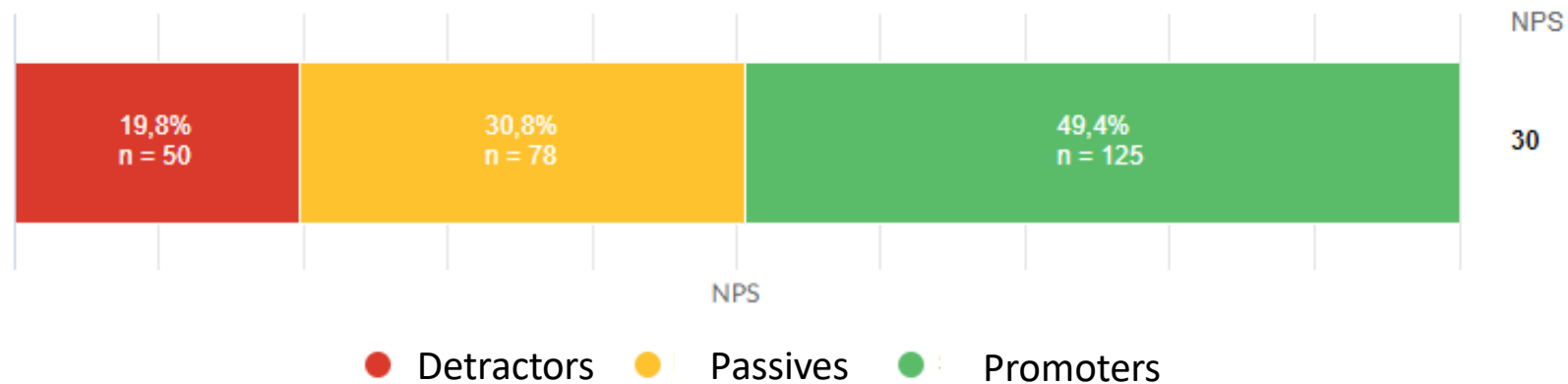
☐ Päivittäin

1. **How to improve the customer experience of contactless payment?**
2. **What expectations do customers have regarding contactless payment?**
3. **Can contactless payment replace any current payment methods?**

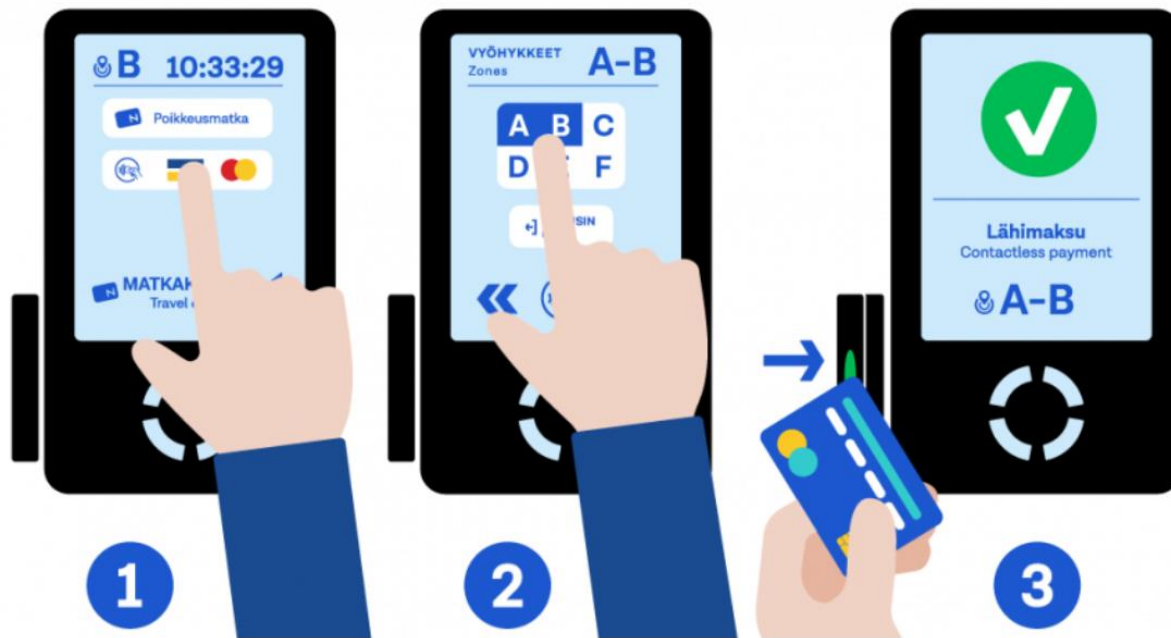
“Have You already tried contactless payment?”



1. How to improve the customer experience of contactless payment?



”What can be improved when choosing the contactless payment?”



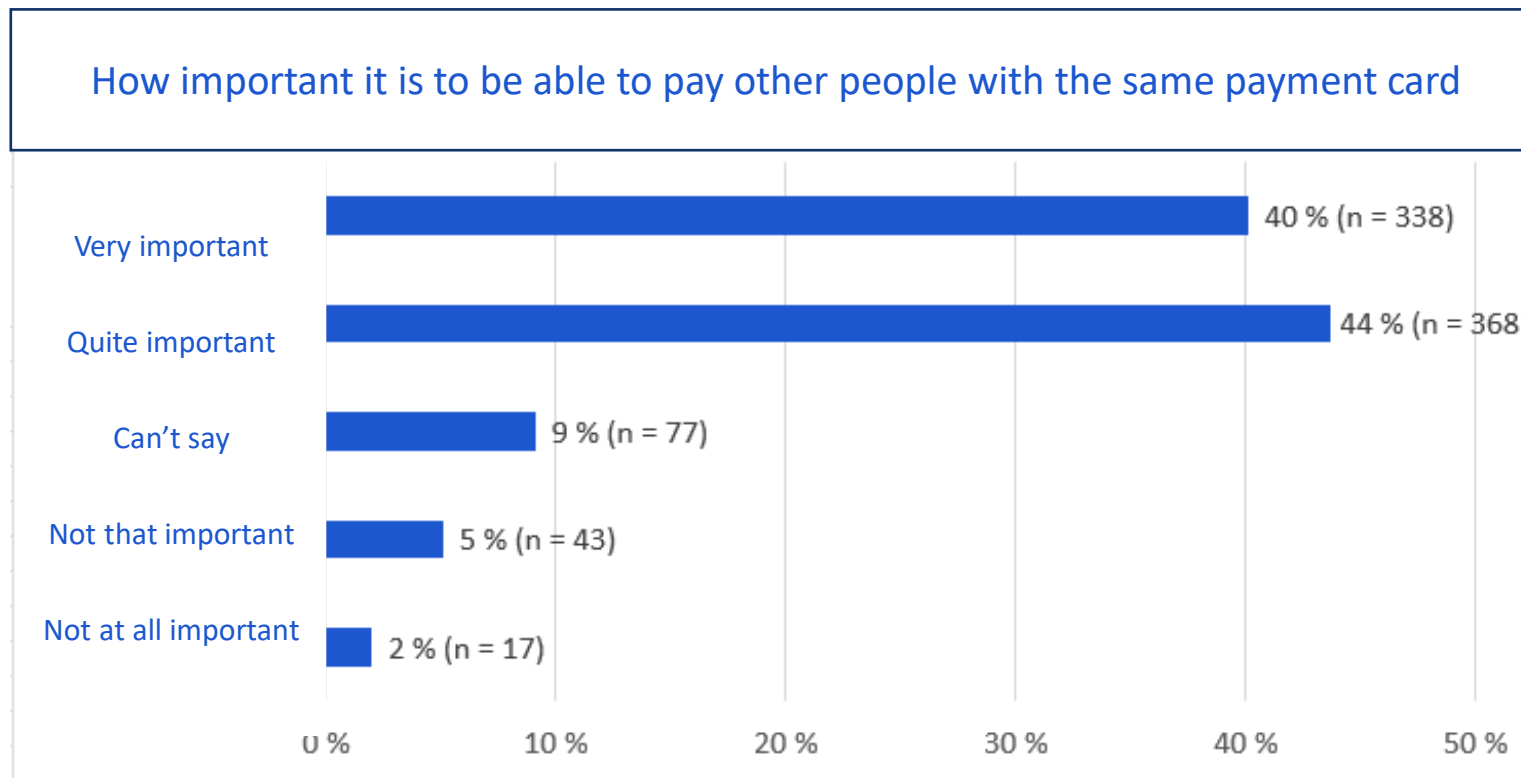
- Refine the look of the cEmv button
- Add more text to the UI
- Directly show the payment card, aka skipping part 1 and 2
- Adding guidance

How could the device better show the place where the payment card is shown?

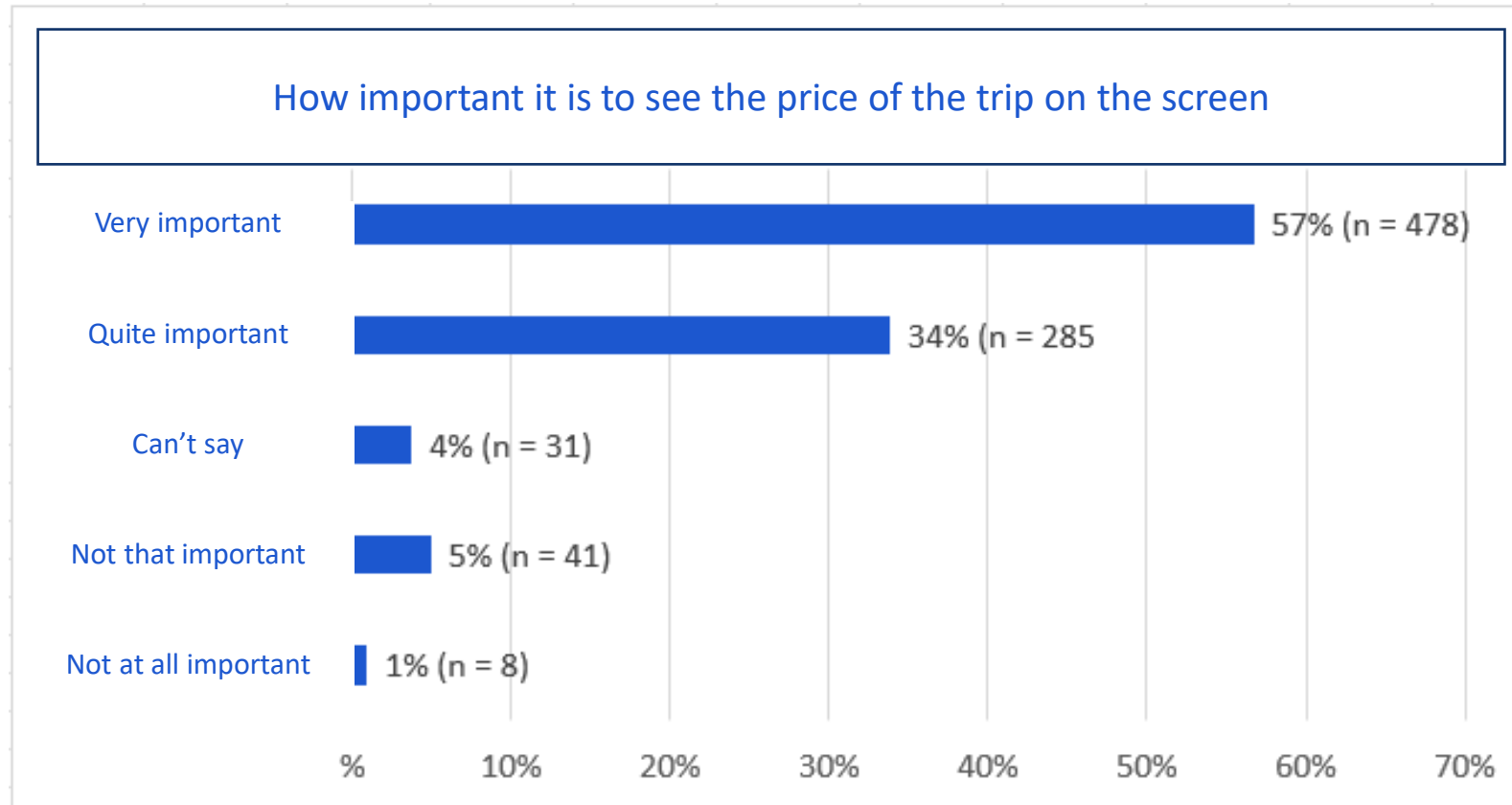
1. Arrow on the screen to indicate the correct position
2. Change the location of the nearest payment reader and add information
3. Other UI improvements



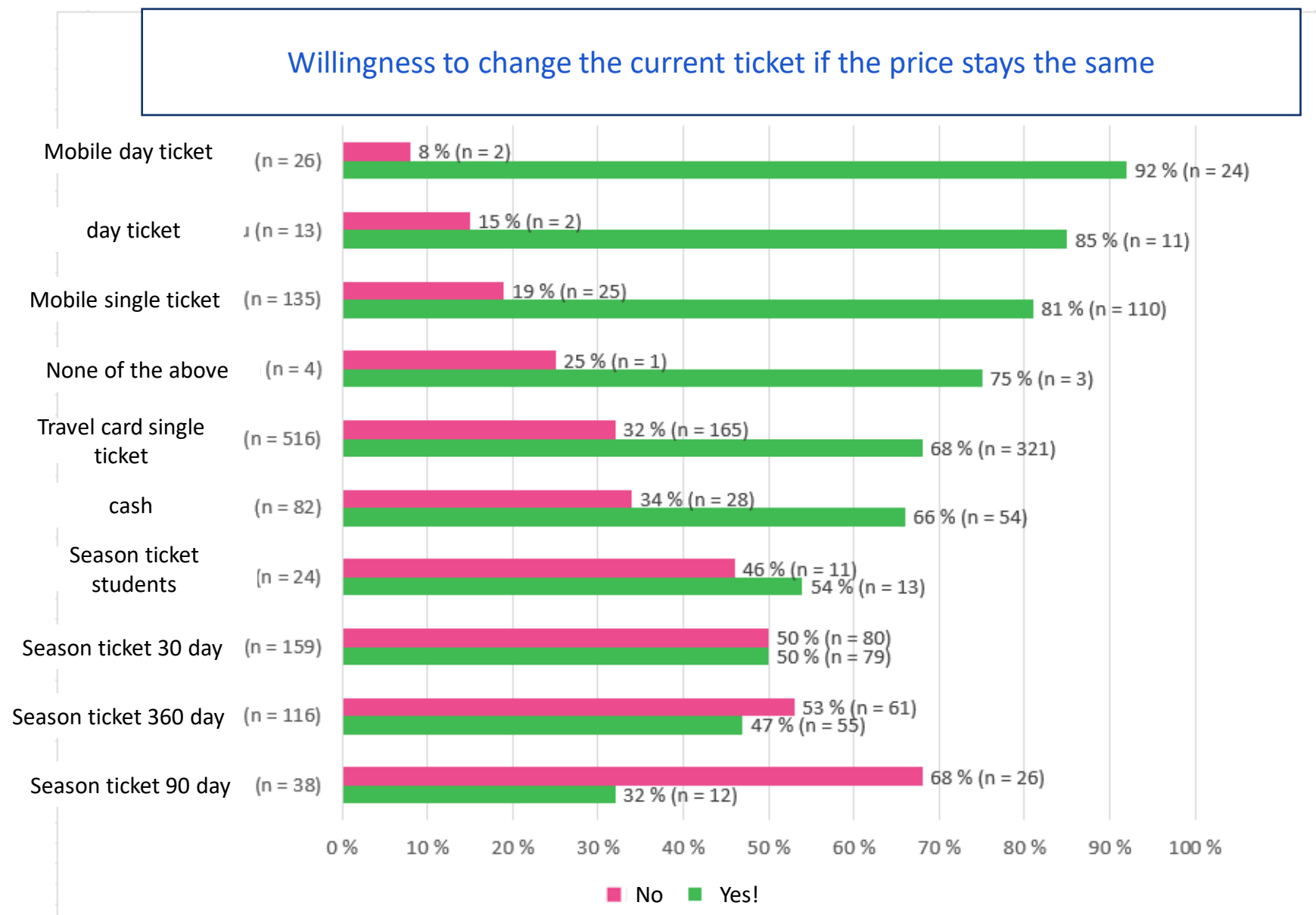
2. What expectations do customers have regarding contactless payment?



2. What expectations do customers have regarding contactless payment?



3. Can contactless payment replace any current payment methods?



NYSSE

Conclusions

- Customer profiles helps us to design the service taking into account different needs.
- The current customer experience of contactless payment was perceived as reasonably satisfactory.
- The open-ended questions still gave a lot of good and concrete development ideas.
- All the missing functionalities, **like the ability to pay for another person** and the **visibility of price while paying**, were all perceived as important additions in further development.
- Tickets used for occasional travel were also perceived as tickets that could be more implemented to be used with contactless payment.

And actions

Day ticket since February: There is a price cap for trips made during 24 hours paid with contactless payment

Nysse will end all cash payments until summer 2022.

Reworking the UI during 2022

Day ticket, 2-6 zones

24 h contactless payment › 24 hours price cap	2	3	4	5	6
All age groups	7,00	9,00	11,00	13,00	15,00



Price and cross-price elasticities of commuting trips after price shocks

A panel data analysis of revealed preferences

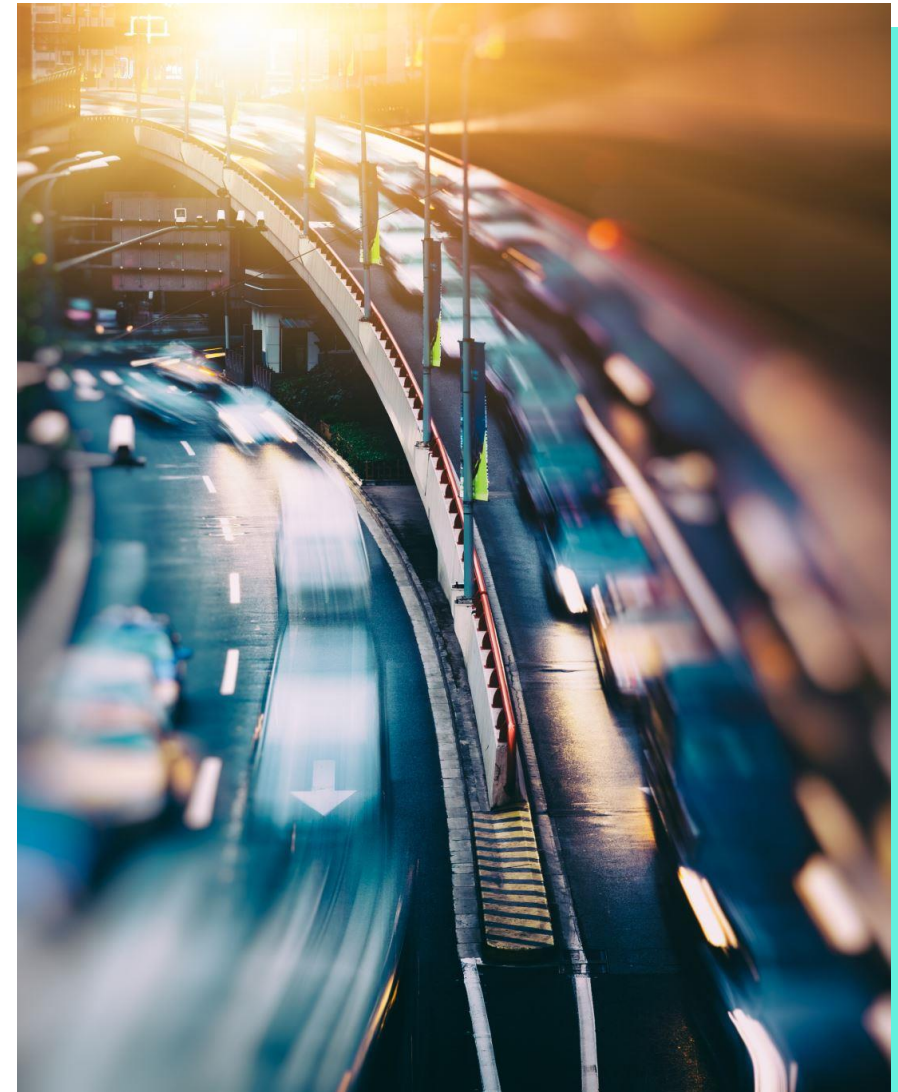
Stian Brosvik Bayer

01-06-2022, TURKU

- How should the introduction be? My self, research areas and Phd-project, or disposition of the presentation?

Research questions

- What is the effect of two policy imposed price shocks in the transport market on mode choice of commuters?
 1. Reduction of public transport cost by 33 %
 2. Increased cost of fossil car use through a redesign of the existing toll cordon system
- Does the effect vary by how the commuters are affected by road tolls?

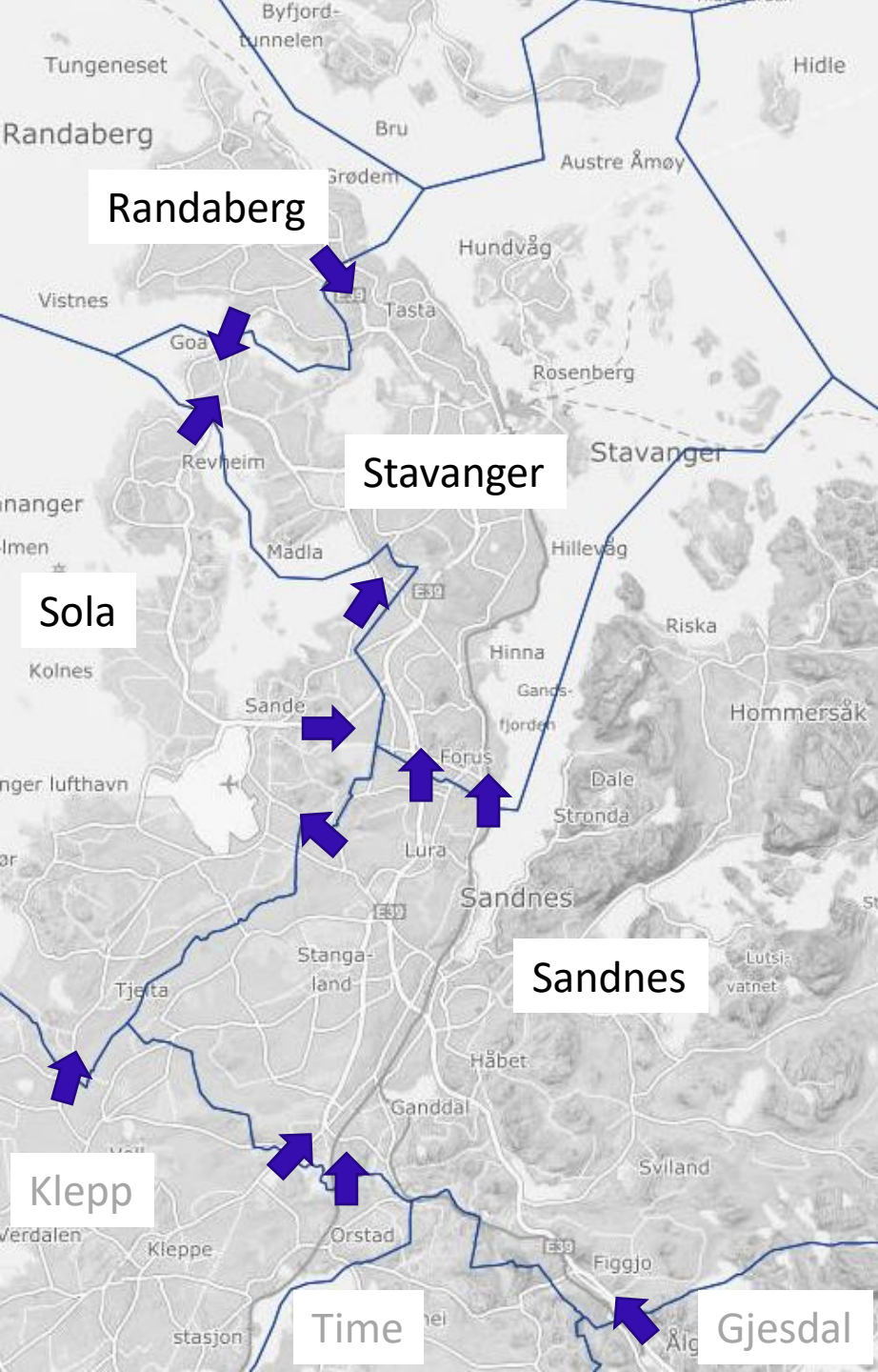


The case area – Stavanger region



- Is a map of Norway and the location of the case area needed?

- Norway's nationally determined contribution under the Paris Agreement is to reduce emissions by at least 40 per cent compared to 1990 levels by 2030 (and 50 percent within the transport sector)
- The Norwegian government has reached agreements with major cities, co-funding investments in urban infrastructure. Conditions:
 - Zero growth in individual car use
 - Ensure good accessibility for all traffic groups
 - 50 per cent local funding
- The agreement makes € 3 mrd. available for infrastructure projects in the Stavanger area – local funding through increased road tolls

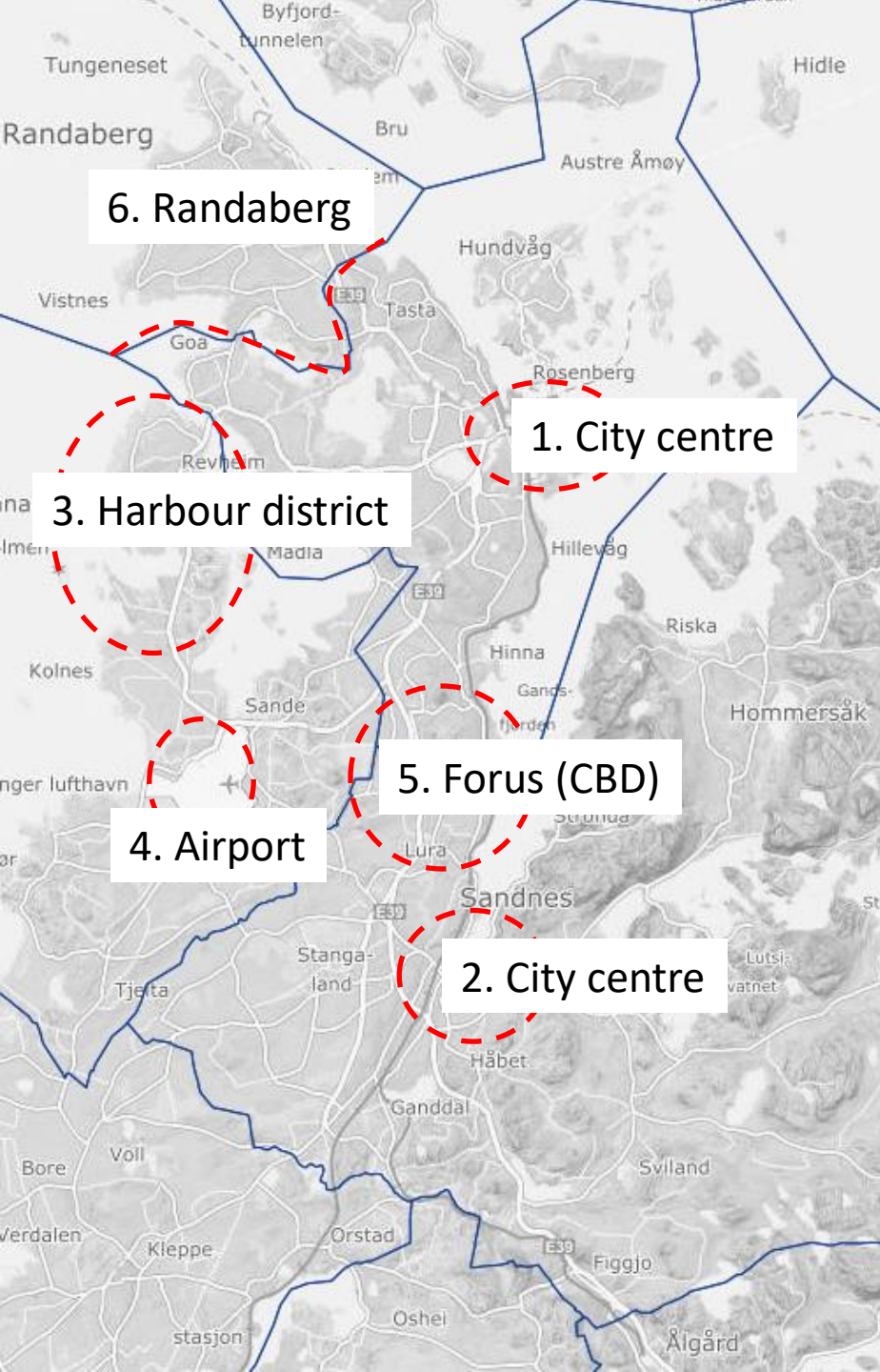


The case area before october 2018

- Four municipalities
- Two city centres
- Population: 250 000 (+ 100 000 in the region)
- «Oil capital of Norway» - High average salaries

The toll cordon system:

- Toll stations at the municipality borders with payment direction towards Stavanger
- Toll rate: € 2 flat rate, 20 % discount (€ 1,6)
- Zero Emission Vehicles (EV): free
- One charge per hour



The case area after October 2018

- 5 new toll cordons were introduced around 1. Stavanger and 2. Sandnes city centre, 3. the harbour district, 4. airport and 5. Forus - Central Business District (CBD)
- Only the toll stations at 6. Randaberg were kept as before
- Toll rate: € 2,2 20 % discount (€ 1,8)
- Time differentiated rates (double rate) morning and afternoon Oct. 2018 – Feb. 2020 except Dec. 2018 – March 2019
- EV: free (until February 2020)
- One charge per hour – first passing is charged

What is HomeWorkHome (HJH)?

A bundle of transport measures targeting private and public organisations and their employees in the urban Stavanger area. In 2018 the mobility initiative covered over 600 organisations and 40 % of all employees.

Slogan: «Park the car at home, sometimes»

Home page: <https://www.hjemjobbhjem.no/>

Membership benefits:

- HJH-ticket (30 %-70 % cheaper than regular public transport tickets)
- Real-time display of public transport schedules at work
- Free use of the city's bikeshare system
- E-bike rental service
- Personal mobility consultancy
- Information stands, competitions etc.

The dataset

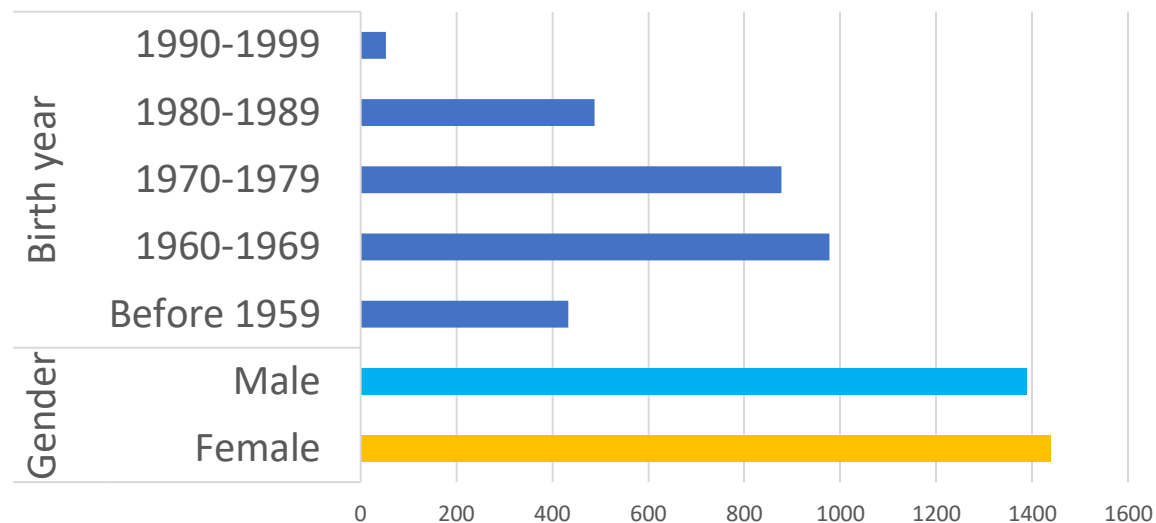


- Periodically conducted travel surveys sent to HJH-employees (local census). First survey conducted in 2016, last in 2019.
- Three periods:
 - T1: Before HJH-membership entry (80 % response rate required)
 - T2: after HJH-membership entry (50 % response rate required)
 - T3: After the change of the toll cordon system (1. okt 2018)
- Answers between periods connected. A panel of 2829 individuals is established
- The survey contains information on residential and work place address, mode choice use over a week, parking conditions at work, gender and age.
- Travel time, distance and costs are calculated for six modes

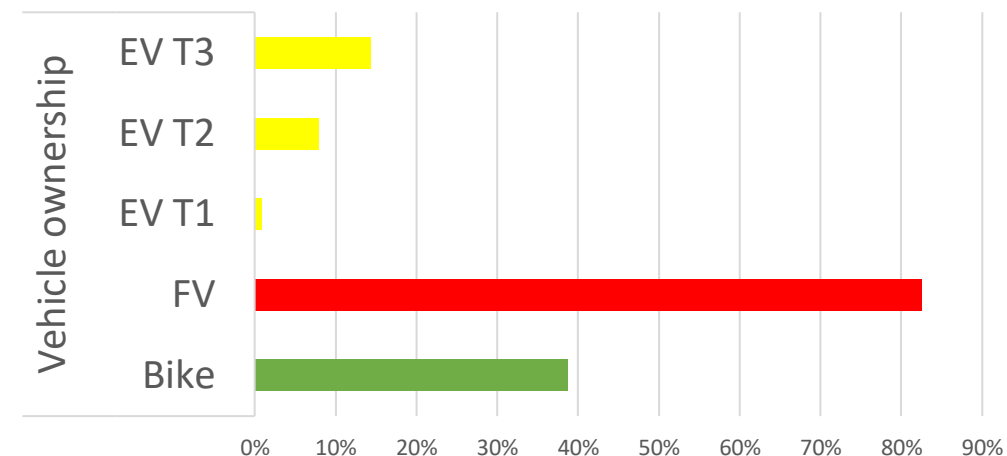
Panel characteristics



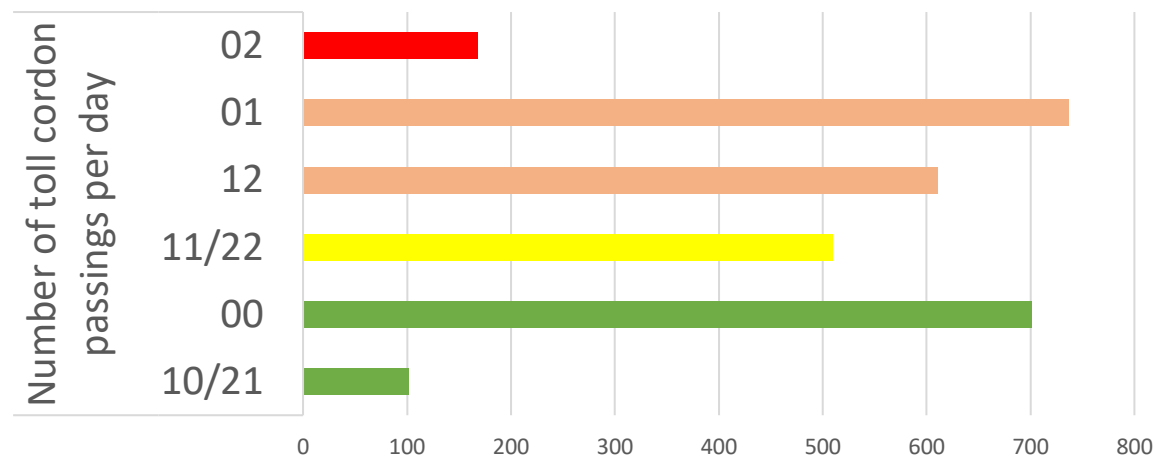
Age and gender



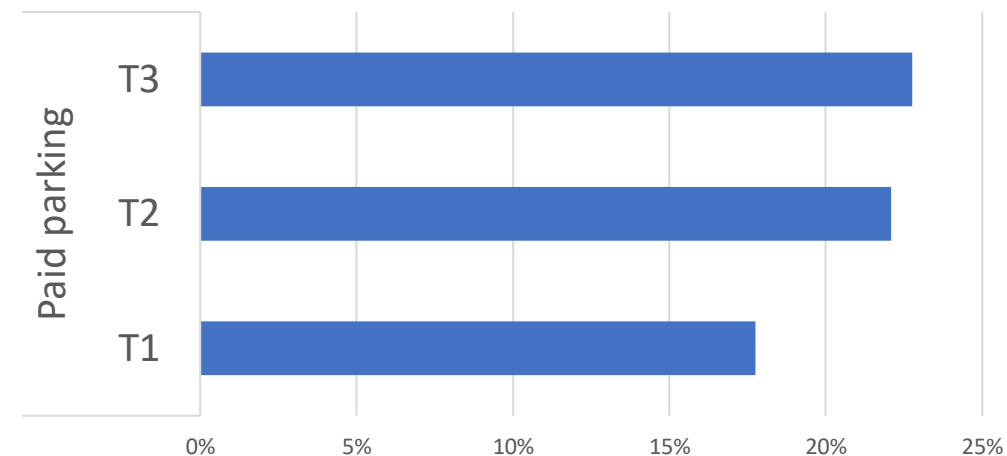
Access to means of transportation

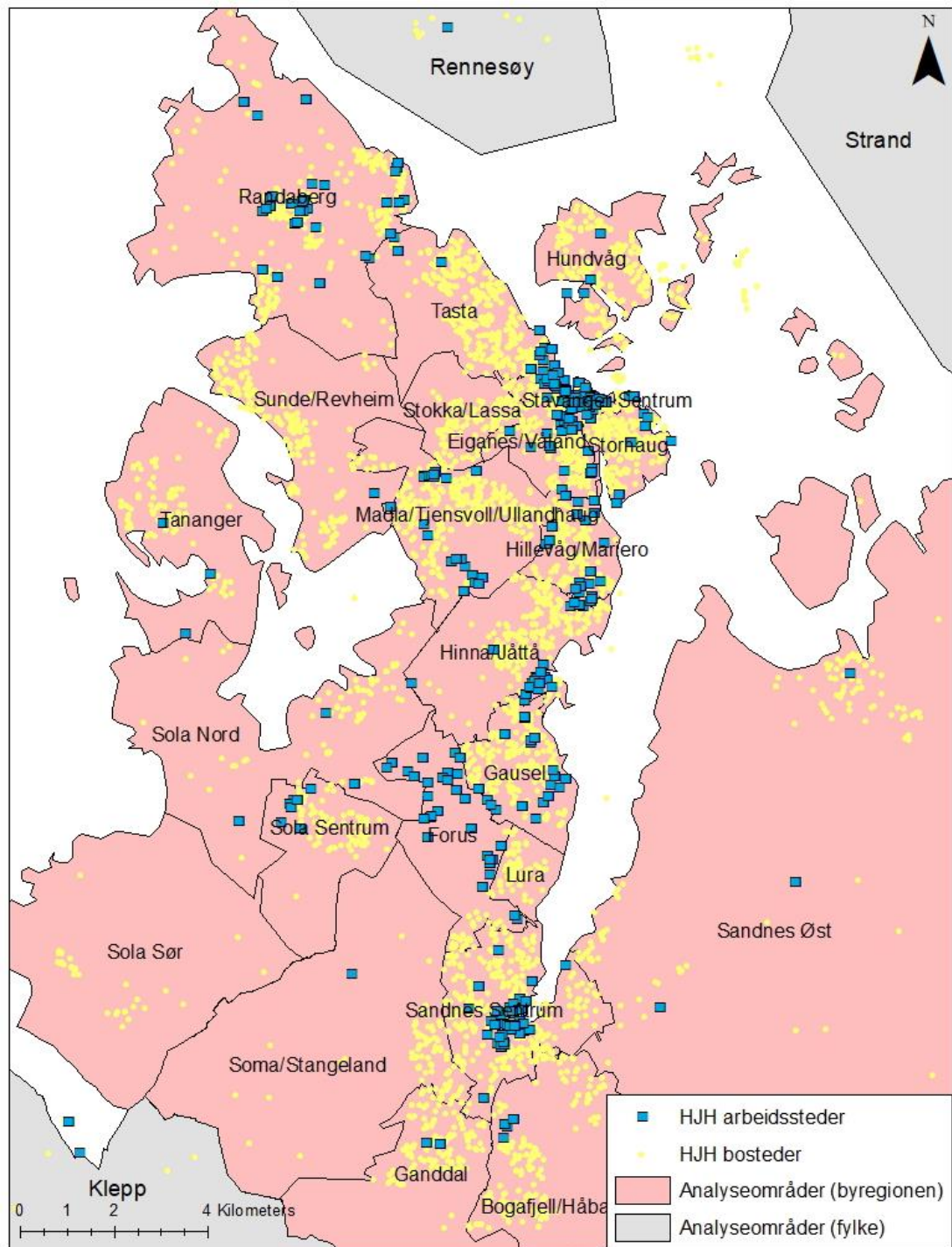


Payment of road toll before/after



Parking conditions at work

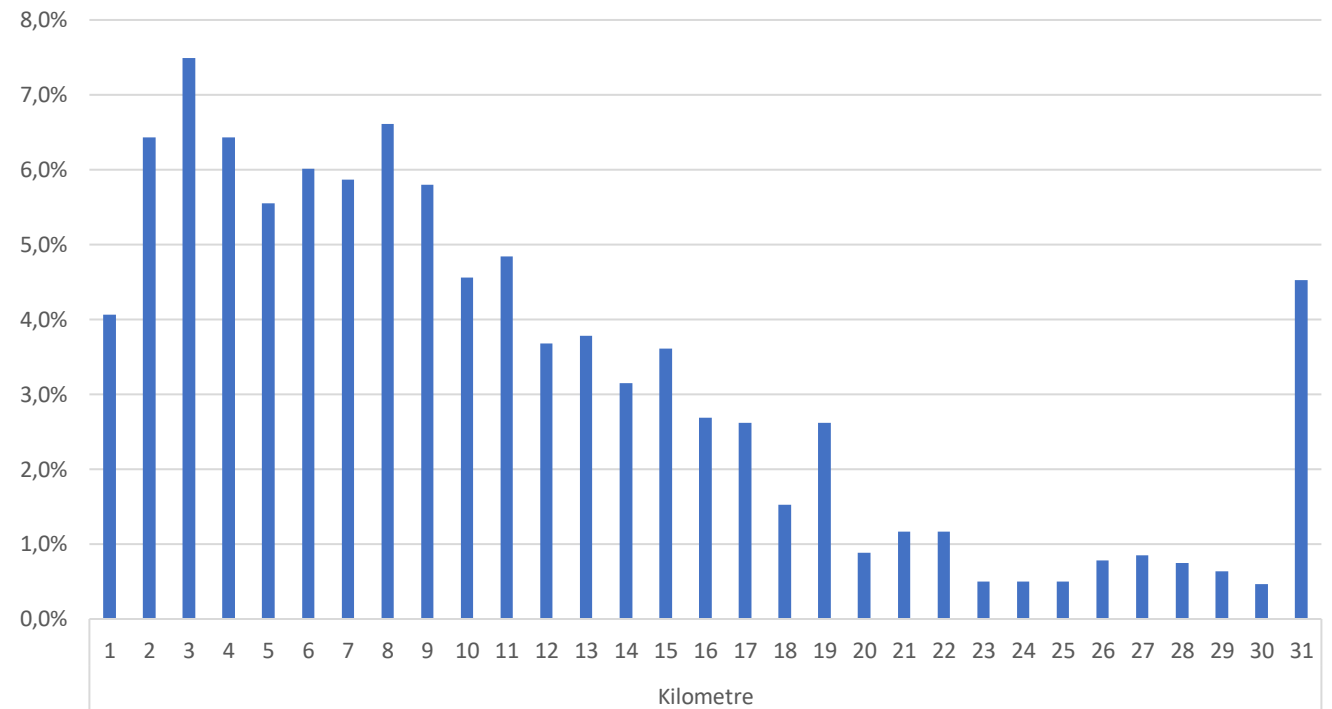




Panel characteristics



Travel distance to work



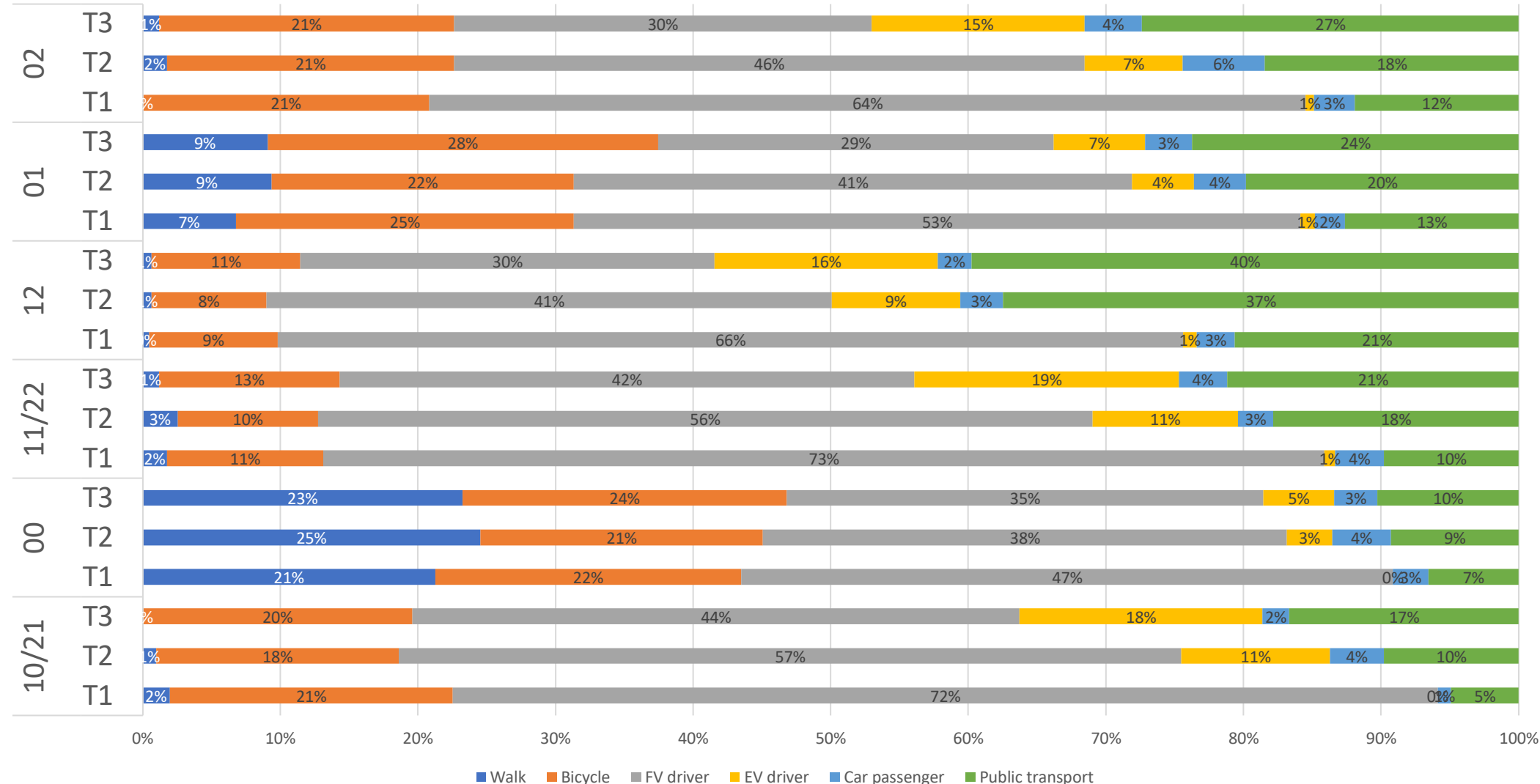
Mode choice of commuting trips by time period

Period	Walk	Bicycle	FV driver	EV driver	Car passenger	Public transport	Average Cost	
							FV	PT
T1	8%	18%	59%	1%	3%	12%	€ 2,4	€ 3,6
T2	9%	16%	44%	7%	4%	20%	€ 2,8	€ 2,6
T3	9%	20%	34%	12%	3%	23%	€ 5,4	€ 2,8

The influence of the toll cordons



Modal split by number of toll cordon passings before/after Oct. 2018



Calculation of price elasticities

- The calculation requires that the effect of the price change is isolated from other factors influencing mode choice
- Theory: Random Utility theory (D. McFadden)
- Calculation: Mixed logit

$$V_{njt} = ASC_j + \beta_{1j}\mu_{njt}TT_{njt} + \beta_{2j}C_{njt} + \beta_3P_{nt} + \mu_{nj} + \varepsilon_{njt}$$

$$Mode = Const + \beta_{1j}Travel\ time + \beta_{2j}Cost + \beta_3Parking + age + gender + \mu_{nj} + \varepsilon_{njt}$$

Output



	MNL		ML1		ML2	
Name	Value	Rob. t-test	Value	Rob. t-test	Value	Rob. t-test
ASC_Bicycle	-1,00	-5,64	-0,69	-1,89	-1,68	-3,47
ASC_CP	-1,55	-6,72	-1,14	-4,03	-1,75	-5,65
ASC_EV	0,91	3,18	2,48	2,73	0,91	1,78
ASC_PT	-0,26	-2,54	0,54	1,11	-1,05	-1,38
ASC_Walk	-0,65	-3,58	-0,24	-0,31	-0,63	-1,29
Panel_Walk					2,16	20,20
Panel_Bicycle					1,46	26,20
Panel_FV					-0,03	-0,45
Panel_EV					2,51	10,10
Panel_CP					1,04	13,00
Panel_PT					3,34	31,70
Parking_Bicycle	0,36	7,95	0,49	3,50	0,59	3,39
Parking_CP	0,39	4,65	0,59	3,40	0,80	3,21
Parking_EV	-0,36	-2,79	-0,57	-2,17	-0,44	-0,70
Parking_PT	1,12	31,40	1,40	9,71	1,61	8,64
Parking_Walk	0,82	14,30	0,85	3,11	1,18	4,47
Travel cost	-3,63	-31,20	-4,21	-12,60	-4,94	-10,50
Travel cost * 01	1,45	10,70	1,20	3,65	1,51	3,23
Travel cost * 11	1,85	15,00	1,49	4,37	1,91	3,94
Travel Time (mean)	-0,95	-21,00	-5,93	-19,50	-1,60	-7,72
Travel Time (stdev)			7,67	27,10	-0,96	-7,99

- The travel cost coefficient tells that one unit increase for a given mode will reduce the utility of that mode by
 - -4,94
- However, the interaction term tells that those recently imposed with road toll will react weaker to a unit increase in travel costs than those not paying road toll:
 - $-4,94 + 1,51 = -3,43$
- And those accustomed with road toll reacts even weaker:
 - $-4,94 + 1,91 = -3,03$

Results



Thank you. Takk.
Merci. Gracias. Obrigado.

Stian Brosvik Bayer
stba@norceresearch.no

norceresearch.no

NORCE

DEMAND RESPONSIVE PUBLIC TRANSPORT AND TRAVEL CHAINS – EXPERIENCES FROM PORVOO AND UUSIKAUPUNKI



Johanna Taskinen, Matkahuolto
ECOMM 2022, Turku

Matkahuolto in brief

Finnish Matkahuolto was established in 1933 to market and provide bus and coach transport services. Matkahuolto is owned by the Finnish Bus and Coach Association and regional associations of private and public undertakings engaged in car, bus and coach transports, i.e., Finnish carriers. Matkahuolto caters for hundreds of bus and coach companies that operate routes with a total of 75,000 stops.

Matkahuolto's business operations are divided into Passenger Services, Parcel Services and Carrier Services. We offer our custo-

mers - consumers, businesses and carriers - a wide range of travel, transport and logistics services to help people and parcels reach their destination quickly and effortlessly.

Our extensive service network includes hundreds of partners. We operate over 2000 customer service points across the country. Most of our business is concentrated in Finland. However, at the end of 2020, parcel delivery services were extended to dozens of European countries, such as Sweden, Denmark, Estonia and Germany.

Revenue
€92,3m



Matkahuolto
employed

718 people
at the end of
2020



Most positive
brand in the logistics sector*

20 million
parcel deliveries



Launch of
**the Routes
and Tickets**
mobile application



Over
7 million
tickets sold

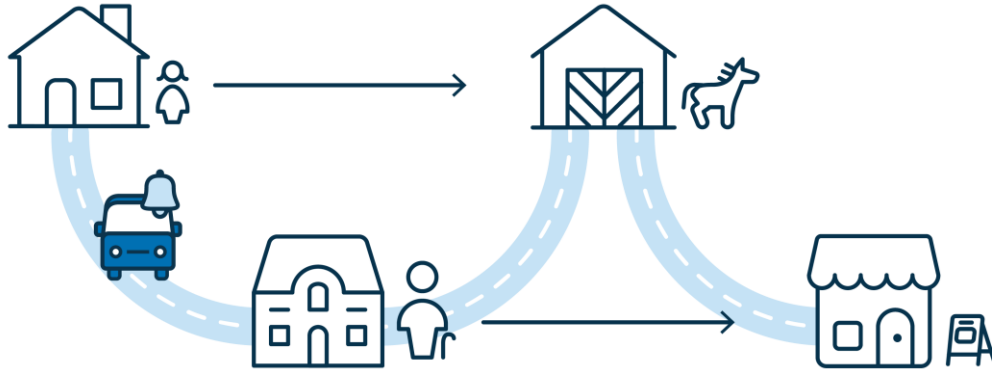


*2020 survey by NayaDaya Oy

How can we arrange – or save – public transport outside the big cities?

How can people living in small cities and rural areas get to supermarket, pharmacy, hobbies and hospital without a car of their own?

Demand Responsive Transport - DRT



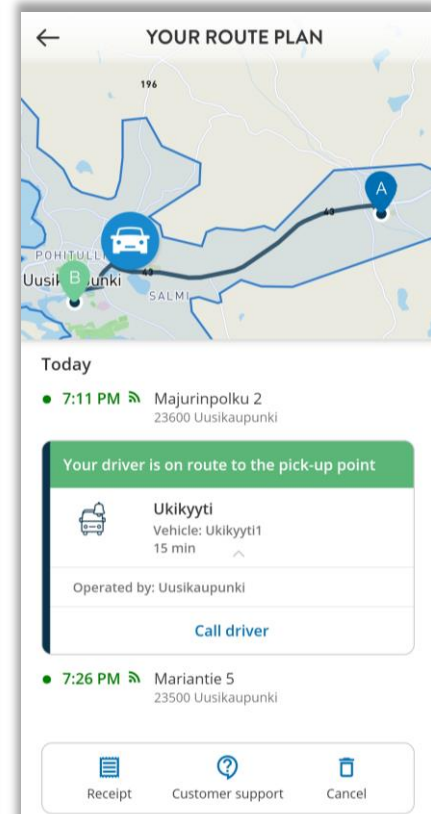
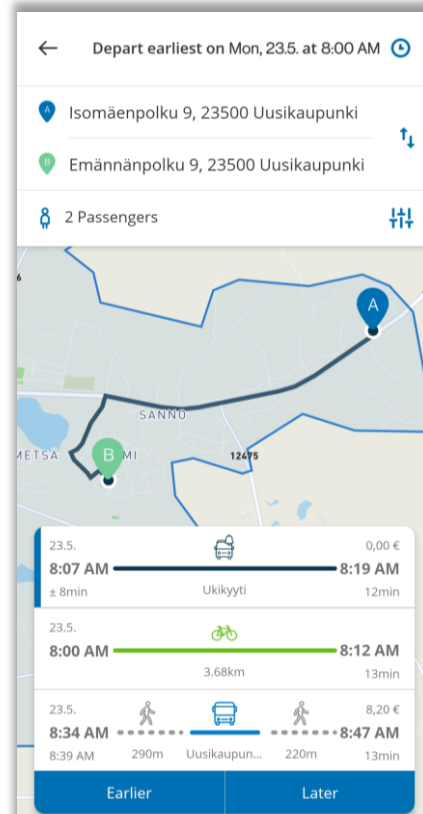
**Public transport
according to
customers' routes
and schedules**

Matkahuolto's DRT platform ***Kutsukyyti*** enables smooth, equal and accessible public transport operation in small towns and less populated areas.

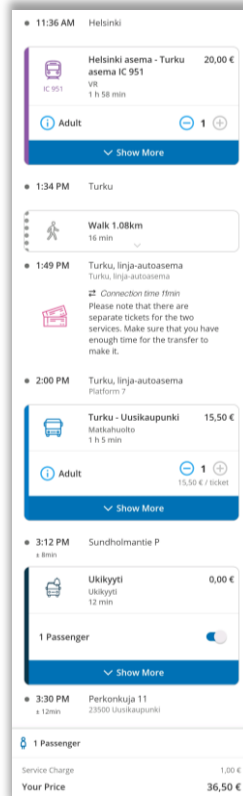
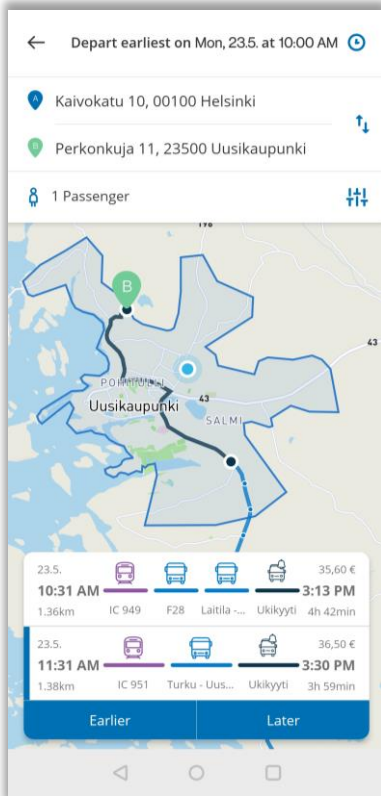
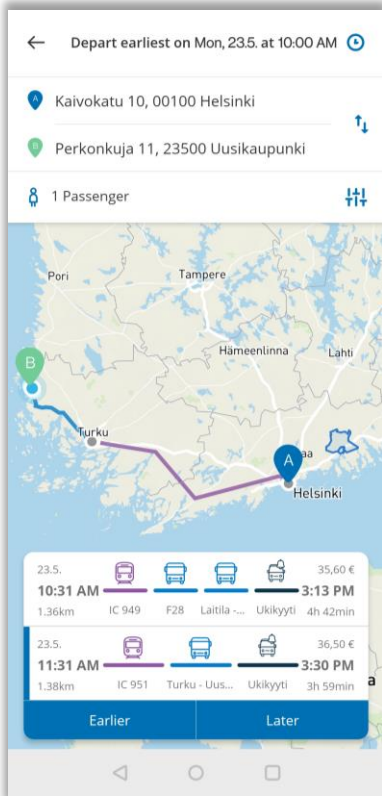
DRT enables easy travel with individual schedules – for everyone



- Download **Trips & Tickets** app
- Set departure and destination, time and number passengers and devices
- Get a ride offer
- Book and pay – or choose to pay in the vehicle or use your valid ticket
- Initial schedule is flexible (e.g. +/- 8 min), so that your trip can be pooled with other passengers
- Follow your exact schedule in real time 30 min before the departure
- Or: book from the call center!



DRT and fixed routes combined: door-to-door travel chains across Finland



← Intercity train

← Intercity bus

← Local DRT service

Trips & Tickets covers all public transport routes and majority of tickets in Finland – now also several local DRT services

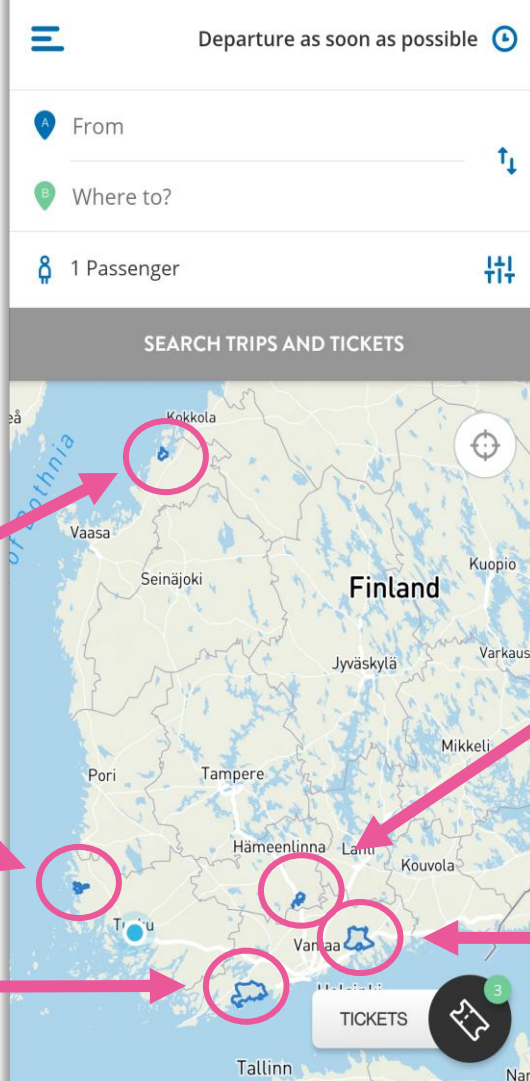
Vippari in Pietarsaari starting in June 2022



Ukikyyti

in Uusikaupunki from December 2021

Ingåket - Inkyyti in Inkoo starting in June 2022



R-kyyti in Riihimäki starting in June 2022



KYLÄKYYTI
Byaskjussen

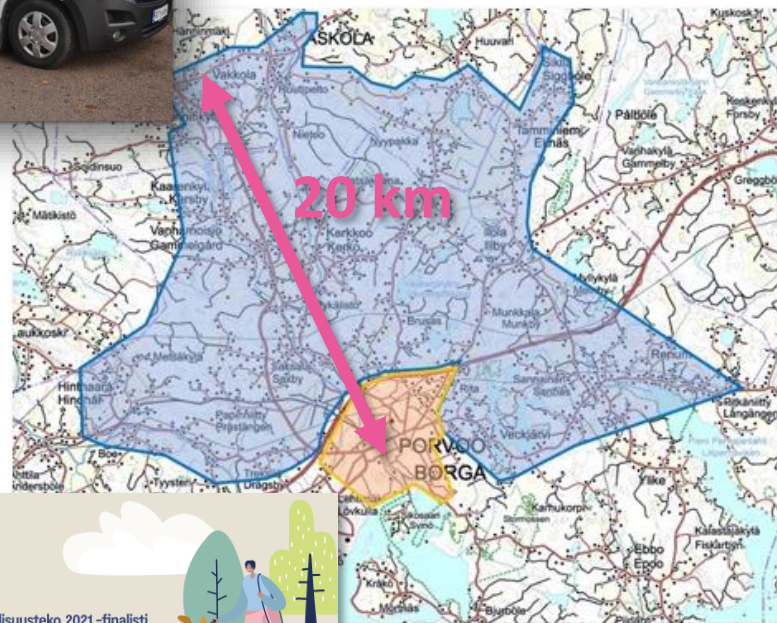
in Porvoo from 2019



KYLÄKYTY
Byaskjussen



- Offered by the City of Porvoo, from January 2019
- Appr. 10 passenger trips per day
- Mon-Fri **evenings** 5 PM – 8.45 PM, Sat 9 AM – 15 PM, when there are no fixed route public transport services
- 2 vehicles and 7,5 vehicle service hours per day (Mon-Fri)
- 2,5 - 9 € per trip
- Trips within **rural area** and between rural and **central area**
- Especially for kids going to and coming from their hobbies
- 2nd place in the competition for the responsibility act of 2021 arranged by the Chamber of Commerce in Finland
- www.porvoo.fi/kylakyyti





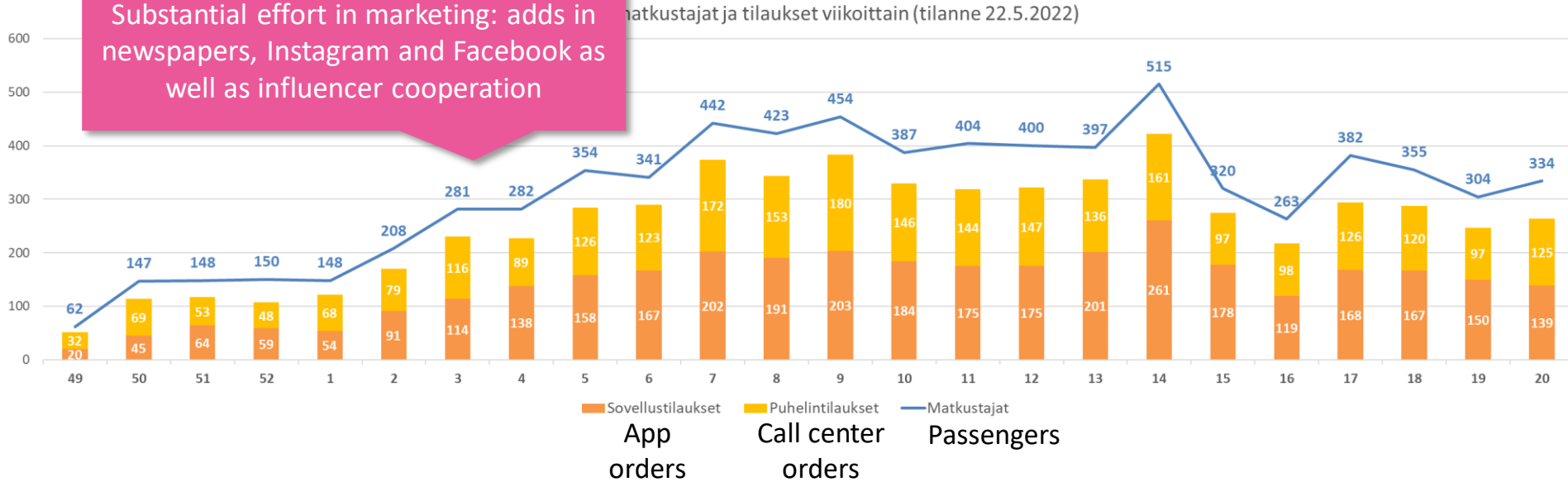
Ukikyyti

- Offered by the City of Uusikaupunki from December 2021
- Pilot continues until December 2022
- 70–100 passenger trips per day
- Mon-Fri 5:15 AM – 9 PM, Sat 10 AM – 2 PM
- 1-2 vehicles, 24 vehicle service hours per day (Mon-Fri)
- 3,2 passengers per VSH in average (maximum day: 6,3)
- 2 € for the first and 1 € for the additional passengers per trip order
- 33 % of the trips have been shared with another customer order
- 73 % of Uusikaupunki inhabitants live within the service area
- User survey by 23rd March 2022: 263 respondents, of which 198 had used Ukikyyti (altogether 500 unique users at that point)
- Almost all users recommend the service: NPS = 89
- 83 % said Ukikyyti has improved their everyday life significantly (there was no local public transport in Uusikaupunki before)
- www.uki.fi/ukikyyti



Number of Ukikyyti orders and passengers per week

Substantial effort in marketing: adds in newspapers, Instagram and Facebook as well as influencer cooperation



60 %

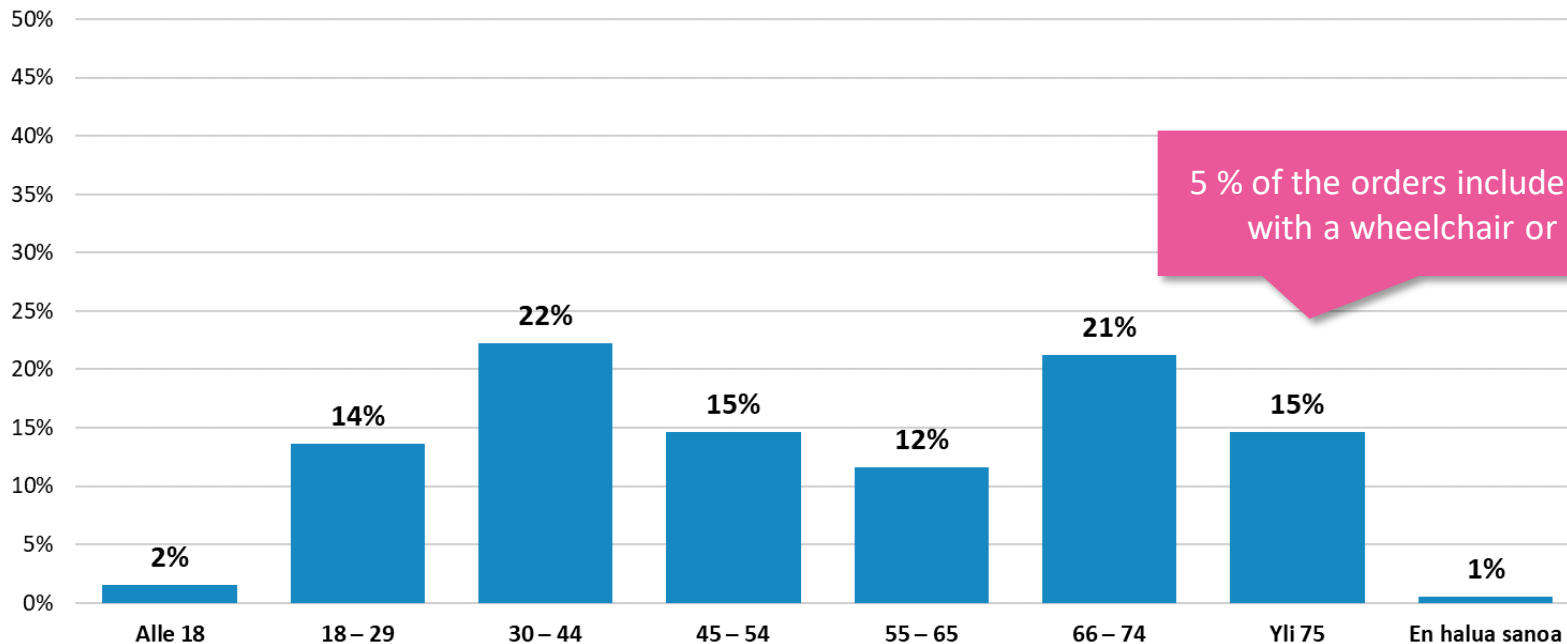
Weeks 15-16 = Easter

Walking and cycling increases in spring

Ukikyyti is used by people from all age groups – especially by young and elderly



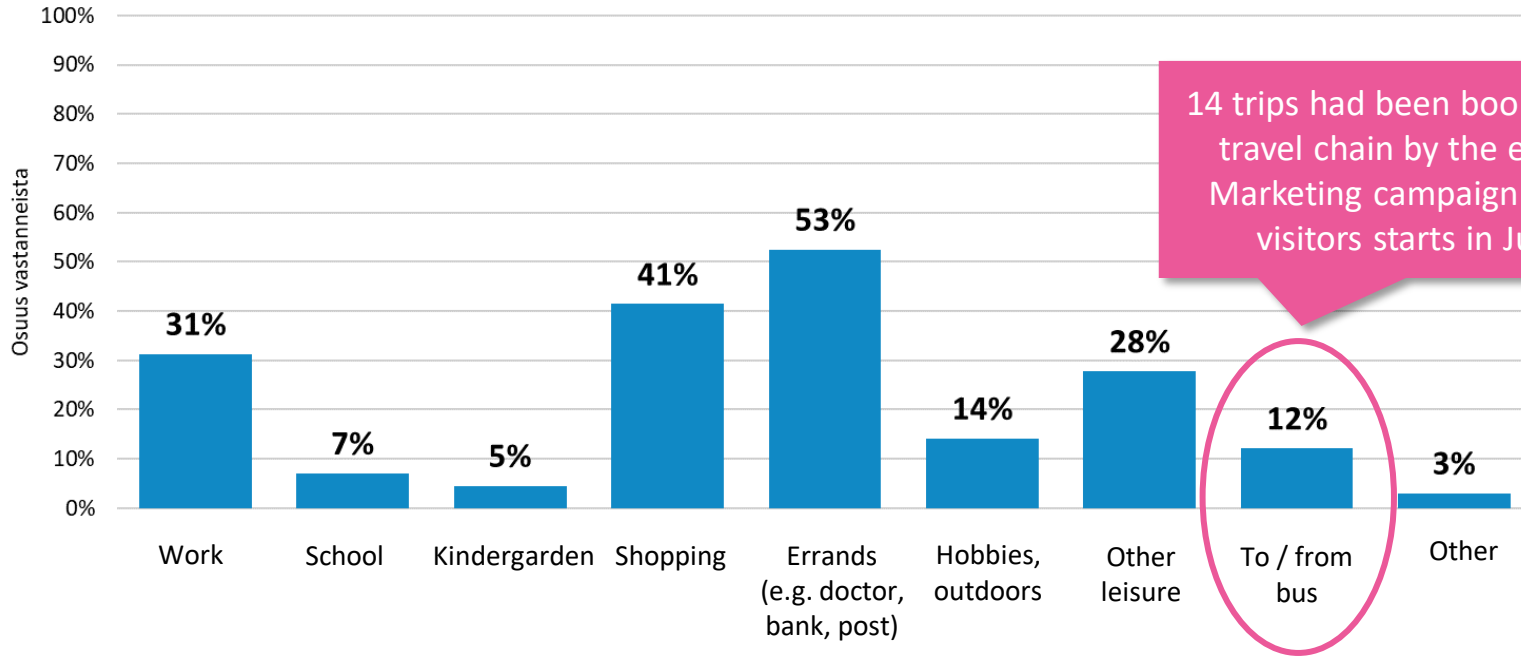
Ukikyydin käyttäjien ikäjakauma asiakaskyselyn perusteella (N = 198)

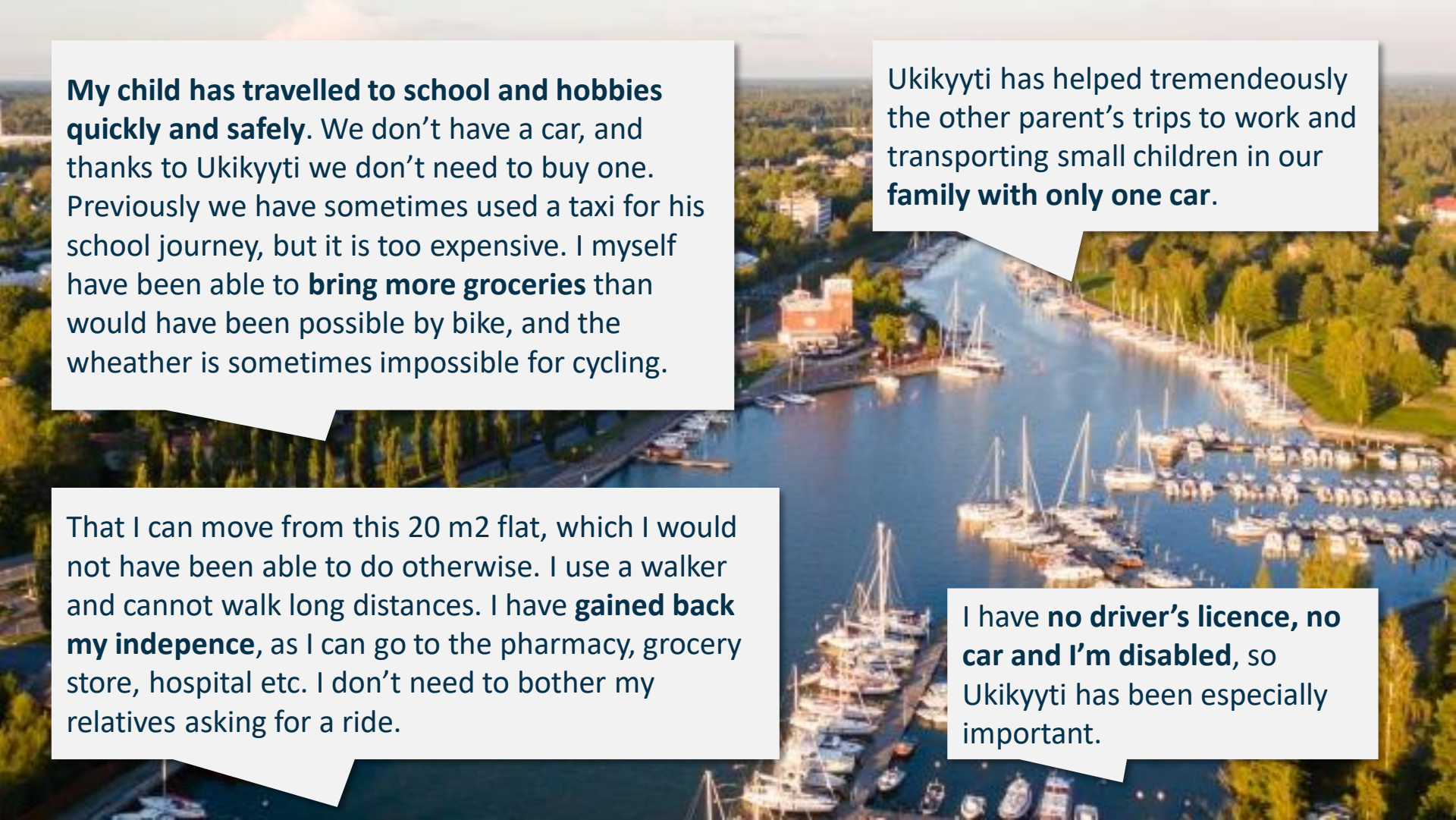


5 % of the orders include a passenger with a wheelchair or a walker.

Which purposes Ukikyyti has been used for?

Mihin tarkoituksiin olet käyttänyt Ukikyytiä? (N = 198)





My child has travelled to school and hobbies quickly and safely. We don't have a car, and thanks to Ukikyyti we don't need to buy one. Previously we have sometimes used a taxi for his school journey, but it is too expensive. I myself have been able to **bring more groceries** than would have been possible by bike, and the weather is sometimes impossible for cycling.

Ukikyyti has helped tremendously the other parent's trips to work and transporting small children in our **family with only one car.**

That I can move from this 20 m² flat, which I would not have been able to do otherwise. I use a walker and cannot walk long distances. I have **gained back my indepen**ce, as I can go to the pharmacy, grocery store, hospital etc. I don't need to bother my relatives asking for a ride.

I have **no driver's licence, no car and I'm disabled**, so Ukikyyti has been especially important.

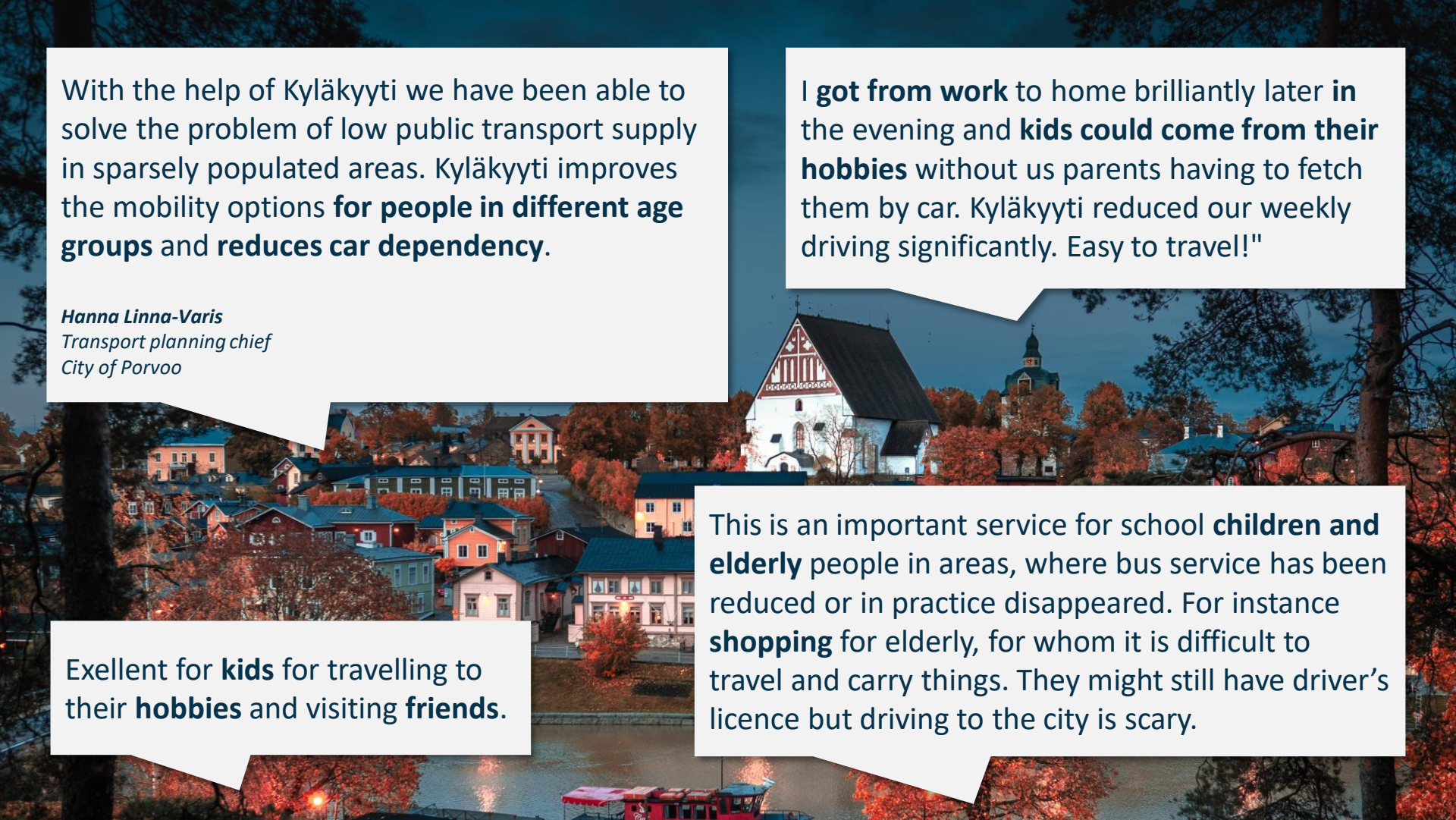
With the help of Kyläkyty we have been able to solve the problem of low public transport supply in sparsely populated areas. Kyläkyty improves the mobility options **for people in different age groups** and **reduces car dependency**.

Hanna Linna-Varis
Transport planning chief
City of Porvoo

I **got from work** to home brilliantly later in the evening and **kids could come from their hobbies** without us parents having to fetch them by car. Kyläkyty reduced our weekly driving significantly. Easy to travel!"

Excellent for **kids** for travelling to their **hobbies** and visiting **friends**.

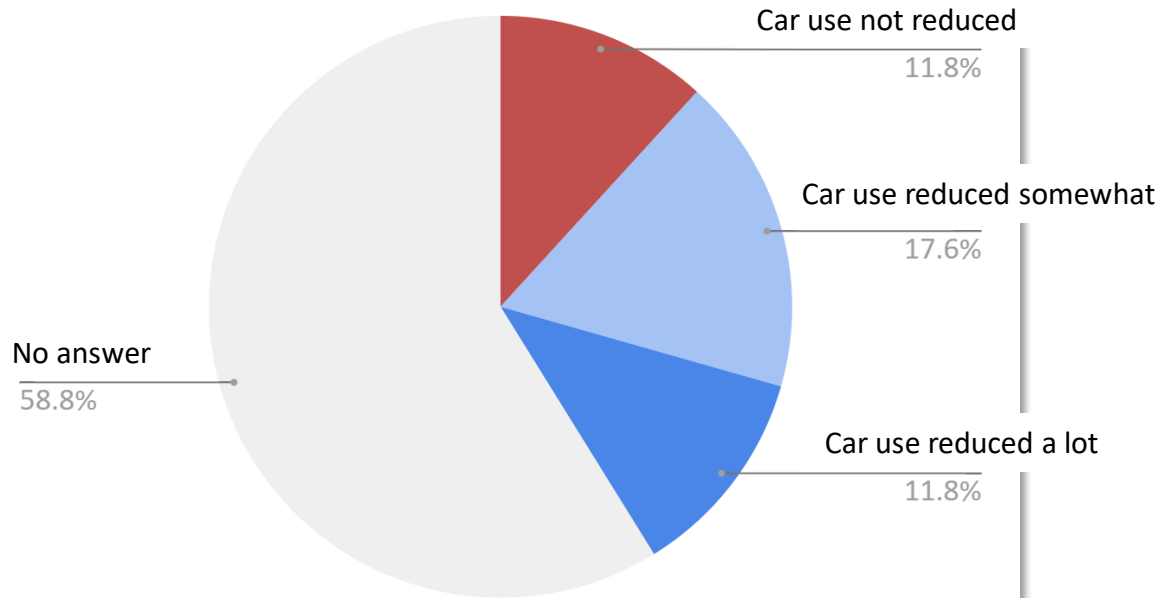
This is an important service for school **children and elderly** people in areas, where bus service has been reduced or in practice disappeared. For instance **shopping** for elderly, for whom it is difficult to travel and carry things. They might still have driver's licence but driving to the city is scary.



20–30 % of the users report that they have reduced car use in their household



Kyläkyyti users:

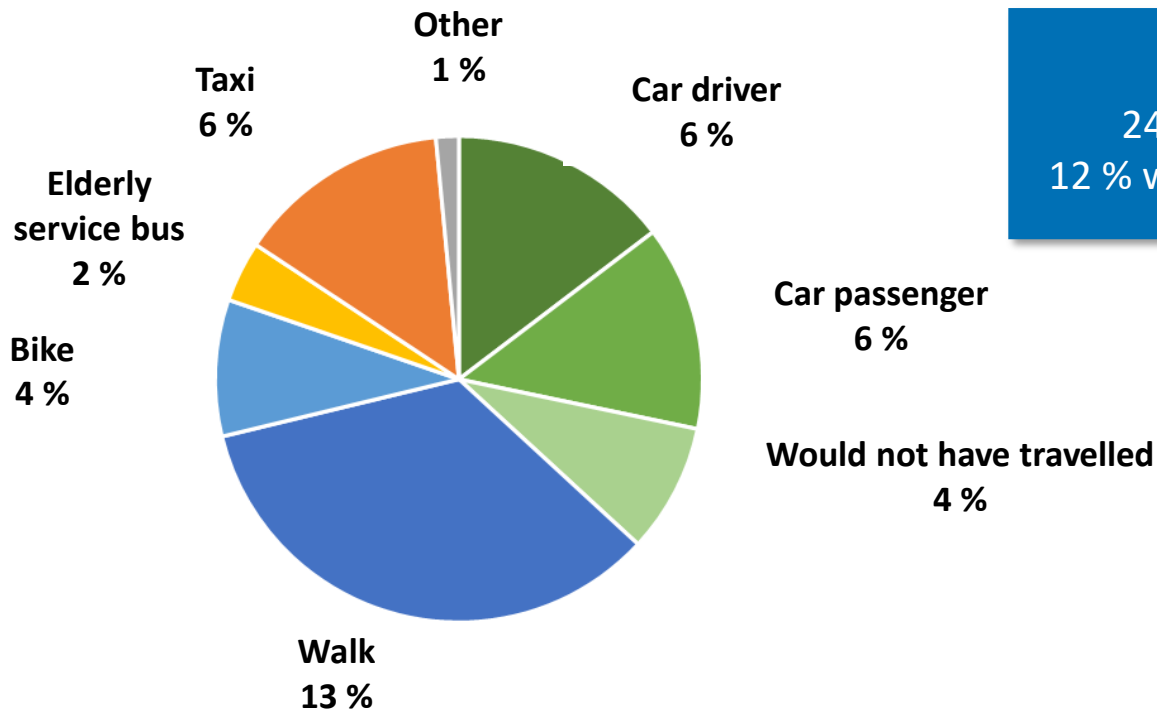


Ukikyyti users:
20 %

DRT replaces car use and creates new journeys – Ukikyyti replaced also walking (very slippery winter!)



(Shares are from all users)



Kyläkyyti:
24 % replaced car use
12 % would not have travelled

THANK YOU!



Johanna Taskinen
johanna.taskinen@matkahuolto.fi
0407573284

Johanna Taskinen

- Master of Civil Engineering and Bachelor of Social Science
- 2002 Masters thesis: The position of cycling in transport planning
- 2002 – 2004 Sustainable transport consultant and researcher (VATT, Strafica)
- 2005 – 2010 National mobility management coordination and car-sharing promotion in Finland (Motiva)
- 2011 – 2014 Workplace mobility management consultant (Mobinet)
- 2015 – 2021 Mobility as a service start up entrepreneur (Kyyti Group)
- 2021 → Demand responsive transport service developer (Matkahuolto)

Husband and two teenagers, no car at any point, cargo bike and trailer, summer cottage, the 2 hour drive there is made with shared cars, mostly Tesla, which is an employee benefit at husband's workplace and operated by a Finnish car-sharing company Omago

Matkahuolto supports municipalities in developing DRT and public transport travel chains



DRT platform

- User app
- Call center web booking interface
- Automated scheduling, pooling and dispatch
- Driver app
- Service setup, maintenance and reports

Customer service

- Online customer service
- Booking call center

Fixed routes platform

- Maintenance of schedules
- User app
- Ticketing: travel cards, web shop, mobile tickets

Pilot coordination and marketing

- Planning of the service
- Marketing and communication, planning and materials
- Training for different user groups (e.g. elderly)
- Collection of feedback: survey and interviews
- Reporting: volumes, efficiency, feedback

Simulation and analysis

- Costs and benefits
- Combining of different transport services across sectors

EMT Madrid initiatives on electrification and Mobility as a Service

Turku, 31st May 2022



EMPRESA MUNICIPAL DE TRANSPORTES DE MADRID



EMT MADRID

Created in 1947.

Company 100% owned by Madrid City Council.

Service 24/7 all year round.

Operates and manages the whole network of public urban buses in Madrid city.

EMT also provides other public mobility services in the city of Madrid:

- **Since** 2014, managing parking facilities and tows.
- **Since** September 2016, the public e-bike sharing system BiciMAD.
- **Since** January 2018, the cable car system

But also managing the segregated bus lanes, buses and bus canopies/shelters advertising exploitation, and Consultancy

ASSETS EMT 2021



EMT is **the reference of surface mobility** in the city of Madrid. It count with **9.816 workers, 7 business lines y 5 Operational Centers** that enable the company to provide integrated, client-oriented services that foster a sustainable and efficient mobility.

BUS

2.068 Buses
84% green fleet
219 lines | 10.574 stops
3.861 km network
5 operational centers



BiciMAD



BiciMAD

3.418 ebikes
454 BiciMAD Go
258 stations
15 districts

PARKING NETWORK

28 parking lot
1 mobility hub
12.451 spaces



Grúa



TOWING SERVICE

77 tow truck
4 bases
5 depots

CABLE CAR

80 cabins
2 stations



Teleférico

ADVERTISING

+4.000
Advertising
supports

CONSULTANCY

8 projects



Consultoría



Autobús

EMT STRATEGY ALIGNED WITH MADRID CITY COUNCIL

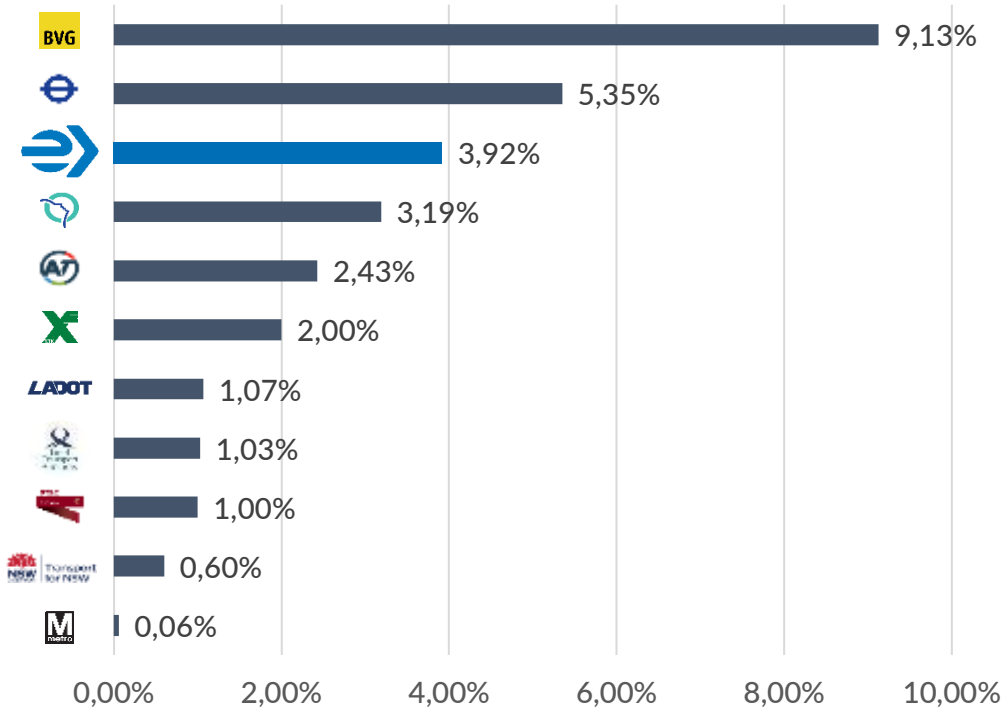
1. EMT **Strategic Plan** 2021-2025.
2. Totally **aligned with Madrid City Council** government strategy (Madrid 360 environmental strategy on air quality and climate change), and with the objectives of the **EU Green Deal**
3. One of the most important objectives is to **make EMT a green and sustainable** company.



SUSTAINABILITY

EMT Madrid is making a **major commitment to sustainability**, which is one of the fundamental levers for achieving the city's **decarbonisation** goals set out in the Madrid360 sustainable mobility strategy. From **2023**, it will operate a **100% diesel-free fleet** and by the end of 2025 it will achieve **25% electrification**.

Fleet electrification (% electric buses, 2020)



Source : Operator reports, 2020

Evolution of the composition of the EMT bus fleet at the end of the year (units)

Fuel	2020	2021	2022	2023	2024	2025	2026	2027
Diesel	388	196						
CNG	1.552	1.678	1.829	1.744	1.661	1.561	1.451	1.351
Hybrid	47	47	17	17				
Hydrogen				10	10	10	20	20
Electric	81	179 ¹	254	329	429	529	629	729
Total	2.068	2.100	2.100	2.100	2.100	2.100	2.100	2.100
% electrification	3,9%	8,5%	12,1%	15,7%	20,4%	25,2%	30,0%	34,7%

Note 1: Electric buses ordered but not yet in service until Q1 2022

Source : EMT Madrid

BUS SERVICE

Fleet evolution

Current e-fleet

- ✓ Total e-buses: **179**
- ✓ Total e-buses by end of 2022: **254**
- ✓ **15 bus lines 100% electric**

Strategic decision: no diesel fleet renewal (2010)

C.O. de Sanchinarro, 2010: First 100% CNG bus depot in Europe

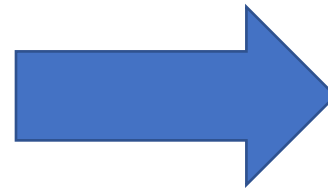
100% diesel free fleet in 2023



Año 2027
673 autobuses



Año 2023
273 autobuses

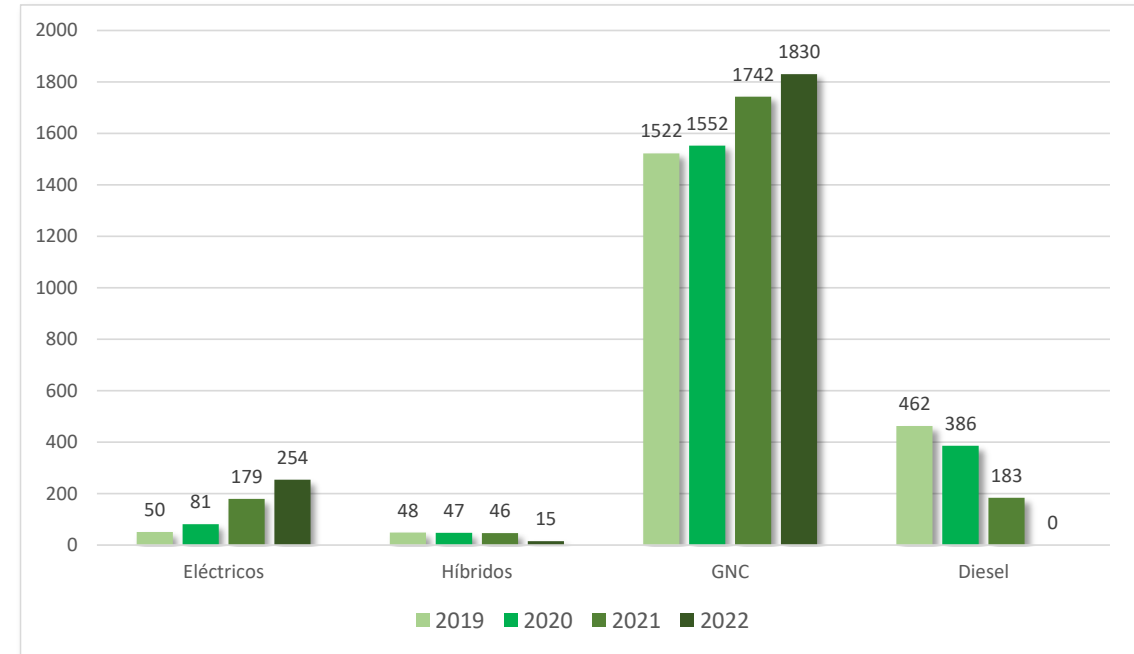


*Short-medium term
2020-2023*

*50 e-buses /year
In 2022 and 2023 :
75*

*Long term
2024-2028*

*100 e-buses
/year*



Electric Bus Deployments

Fleet Renewal: Purchasing Procedure

BID SPECIFICATIONS

EMT needs:
Identification

Requirements:
operational and
test criterias

CONTRACT AWARDING & TENDER

Prototypes:
must verify
specifications

MANUFACTURING PROCESS MONITORING

Factory tour

Due date control

DELIVERY

All units must be
validated and
checked based on
the specifications

ACCEPTANCE CERTIFICATE AND WARRANTY

Batteries
warranty

Penalties

Electric Bus Deployments

Fleet renewal: Purchasing evolution

FIRST STEPS

Vehicle + Charger

Zebra batteries

Plug-in charger

LITIUM BATTERIES

Vehicle + Charger

Lithium batteries

Plug-in charger

AC&DC chargers

DC CHARGERS

Vehicle

Charger

Litium batteries

Plug-in charger

DC chargers

INVERTED PANTOGRAPH

Vehicle

Charger

Litium batteries

Pantograph
charger

DC chargers

SMART CHARGING & NEW DEPOT

Vehicle

Charger

Litium batteries

Pantograph
charger

DC chargers

Electric Bus Deployments

E-buses operation structure

WHAT

WHO

SOME DETAILS...

Fleet supplier



Bus & Charger supplier
Training
Maintenance (during warranty period)

Energy supplier



Critical infrastructure: Power supply
must be guaranteed

Operation &
Maintenance



Bus operator
Bus & Charger maintenance
Training workforce

INVESTMENTS AND FINANCING PUBLIC TRANSPORT PROJECTS

Current Depots: Adaptation

Challenges:

- ✓ Coexistence of different technologies
- ✓ Training EMT workforce in electric propulsión
- ✓ Guarantee grid supply

Now:

- ✓ C.O. Carabanchel: Up to 200 electric Buses
- ✓ C.O. Fuencarral: Up to 50 electric Buses
- ✓ C.O. Entrevías: Project for 10 H2 buses



NEW ELECTRIC BUS DEPOT: REMODELING LA ELIPA OPERATIONAL CENTER

The New Center is designed under the modern operation standards of EMT and with sustainable criteria, maximizing the integration within the surrounding environment

- **Location** – Current one (Avda. Trece Rosas – Ciudad Lineal District)
 - **Surface** – Plot – 32,200 m² / Workshops building area 6,180 m²
 - **Capacity** – 298 buses (12 m long) + 20 buses (18 m long ones) = 318
 - **Fleet** – Electric Buses (in the first phase coexistence with CNG ones)
 - **Project cost** – 116,536,631 €
- ✓ Biggest roofed e-bus depot in Europe
 - ✓ Inverted pantographs



Electric Bus Deployments

Key aspects to consider

Technological evolution causes obsolescence

Charger and vehicles performance depend on weather conditions

Lack of Smart Charging

Significant performance differences between different bus providers, increased by temperature conditions, in the vehicle and also in the charger

Battery life decreases over time

Great differences in autonomy compared to CNG technology

Remote diagnostics & SOC monitoring system



Electric Bus Deployments

Conclusions



Long time: ELECTRIC BUSES

- Electrification is the best solution for sustainable transport
- Charge in depot during the night.
- No opportunity charging except for a few exceptions
- Requires a very high electricity power, but in night periods, where the demand is low

A powerful Supply connection:

- Collaboration with the Administration and electric companies
- Facilities to charge the buses efficiently, reliable and redundant
- More than one depot to provide energy in case of failure



WHY SHOULD A PTO LAUNCH A MAAS?

- MaaS can be seen as a tool for **public goals**
- New sustainable strategy for Madrid: Madrid 360. New SUMP Madrid 360
- Learning by doing as we did with our other mobility Apps



“ MADRID 360



- New Sustainability Strategy with the main lines of action to meet the air quality objectives.
- Most of the measures are in the field of mobility and transport and its implementation is expected to reduce nitrogen oxides (NOx) by 20% by 2023.
- Measures such as the promotion of public transport and shared mobility, dissuasive car parks (park & ride) or those related to the Low Emissions Zone are based on, by nature, **digital means**.





New MaaS proposal from EMT

- BiciMAD, the largest bikesharing information at stops
 - Services integrated (L1) service in Madrid operated
 - Carsharing (x3)
- Single trip ticket for Buses and EMT Motosharing (x2) payment integrated (QR) with payment.
 - E-Scooter (x1)
 - Bikesharing (x2)
- Full featured digital mobility identity with All the Public Transport invoicing, payments and access methods.

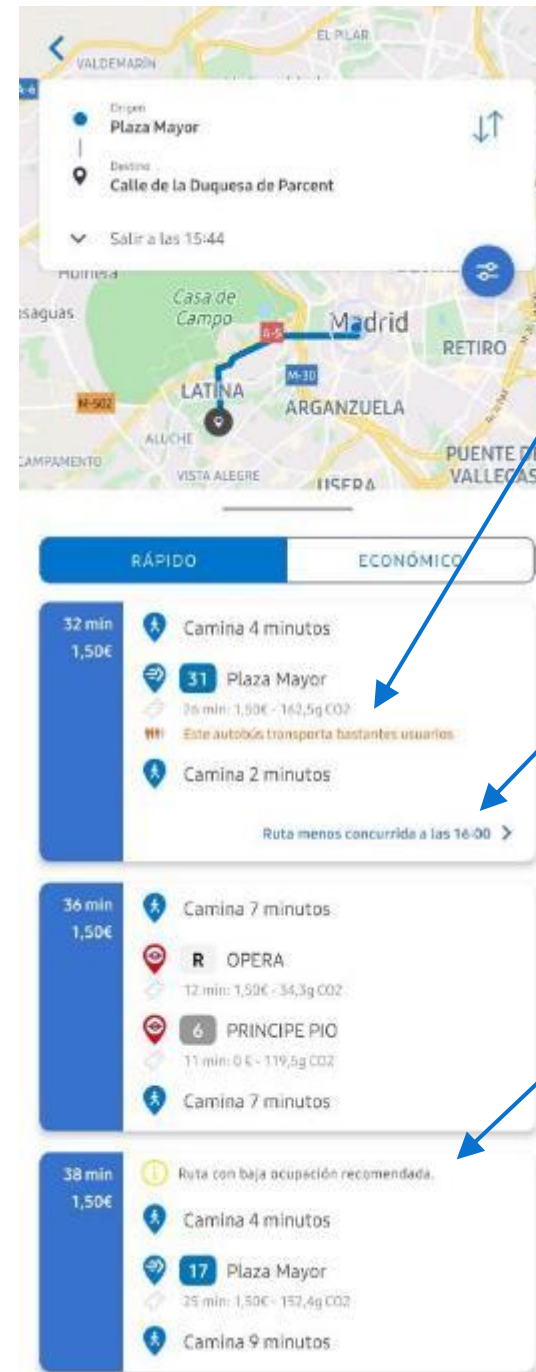


Powerful planner

- Multimodal planner with **occupancy awareness**

Next **two buses** info and low occupancy **alternatives** in planning

Spatial and time spread



When high occupancy route is calculated

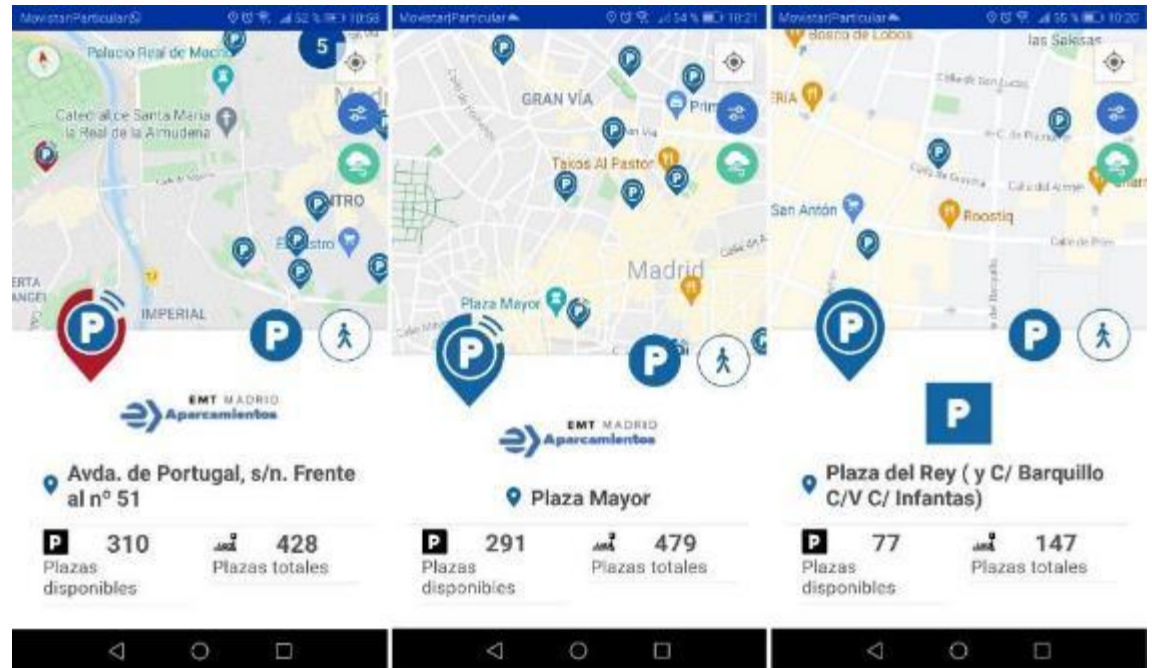
The closer low occupancy time is displayed with a link to that specific planning

An alternative route at the same time is proposed

Park and Ride

Park and ride feature

WINDOWLESS MODE





PRINCIPLES FOR SUSTAINABLE MAAS

1. User centric
2. Towards a safe and sustainable mobility
3. Fair and transparent
4. Non discriminative ecosystem
5. Inclusive
6. Sharing users for users
7. Data Sharing





Trust

Lack of trust is an important MaaS inhibitor.

Madrid's approach:

Principle base approach. Alliance for a sustainable MaaS.

Based on one by one agreements.

Being public was a great asset.

Having dual role helped us a lot.

Opening tickets and services was our main lever.

Technical

Multimodal engines are quite difficult to build and extremely difficult to excel. (Better buy than make)

Integrations is hard, slow and expensive.

More widely used data standards are really welcome (¿MDS, NeTEX or TOMP-API?)

Thanks!

