Sustainable Shared Mobility Webinars

SuSMo

Decarbonising transport systems across Europe

Running through **May & June**

HOSTED BY: Cenex

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Climate-KIC is supported by the EIT, a body of the European Union

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EV Car clubs charge with 100% renewable energy (Edinburgh)

Teresa Sanchis

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Introduction

- Car clubs: types, business models, advantages, succeed factors and regulations.
- Analysis of car clubs across Europe.
- Overview of different car clubs´ companies.
- Why and How?
- Design of the fleet & parking bays.
- Energy, why ensuring a 100% renewable source is key.
- Design of the renewable installations (wind & solar).
- Emission reduction.
- Economic feasibility study.

Fleet

- Edinburgh
- Only EV
- Business model: fixed one-way.
- Models selected: Vauxhall e-corsa and Nissan Leaf (reasons: price, range and liability).
- Fleet 300 vehicles (in concordance with the car club´s companies analysis).

EV Car clubs charge with 100% renewable energy (Edinburgh) / Car club companies overview

Car club companies overview

City	Company	EV?	Business model	Comments
London	Bluecity	Yes	Fixed one way	Closed in February due to the competitive environment
	Co-wheels	No	Round trip	Present all over the UK, in other cities like Aberdeen offers EV
	Share now	No	Free floating	Only EV
	Enterprise	Yes	Round trip	Present in different cities
	Ubeqoo	No	Free floating	Closed in February due to insufficient costumers
	Zipcar	No	Free floating/Round trip	Price £/km
Sofia	Spark	Yes	Free floating	Only EV Fleet 143

City	Company	EV?	Business model	Comments
Bologna	Corrente	Yes	Free floating	Only EV Fleet 280
	Enjoy	No	Free floating	Fleet 133
Madrid	Sharenow	Yes	Free floating	In Madrid only EV Present in different cities
	Wible	PHEV	Free floating	Only EV Fleet 500
	Emov	Yes	Free floating	Only EV Fleet 600
	Ubeqoo	No	Round trip	
	Zity	Yes	Free floating	Only EV Energy 100% renewable – partnership with Iberdrola Fleet 650
	Wishlife	Yes	Free floating	Only EV Price per km Fleet 60
	Respiro	No	Round trip	Fleet 250
Stockholm	Aimo	Yes	Free floating	Only EV Fleet 300
	M Mobility	No	Round trip	

How and why?

- Edinburgh:
  - ✓ Populated city
  - ✓ Students and young population
  - ✓ Favourable regulations
  - ✓ Another car club scheme (Enterprise)
- Fix one-way business:
  - ✓ Guarantee flexibility
  - ✓ Reduction in logistics problems

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EV Car clubs charge with 100% renewable energy (Edinburgh) / How and why?

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- EV
  - ✓ Technically and economic viable.
  - ✓ Solution for both the energy and transport crisis.
  - ✓ Seized political framework- zero emission fleet by 2050.
- Renewable energy
  - ✓ Zero tailpipe emissions.
  - ✓ Renewable electricity is the only path to achieve sustainability.

Fleet - Energy demand

- Assumptions for the calculations:

✓ Fleet in Scotland was 518.

✓ Average distance travelled 4.2 million of miles (6,8 million km)

✓ Vehicles will be charge when 20% of the battery is left.

- Energy demand from the vehicles will be **729.73 MWh.**

	Units	Model 1	Model 2
Make & Model		Nissan LEAF	Vauxhall Corsa-e
Battery capacity	Wh	40,000	50,000
Battery capacity (80%)	Wh	32,000	40,000
Rated Consumption (WTLP)	Wh/km	205	167
Kilometres before charge	km	195	298
Kilometres before charge (20% left)	km	175	268
Scotland´s car club fleet 2018		518	
Distance travelled by Scotland´s fleet 208	km	6,759,245	
Distance travelled per each vehicle		13,049	
Nº charges required per year per car		84	55
Fleet		150	150
Nº charges required per year per fleet		12,543	8,210
Energy	MWh	**401.35**	**328.38**
		729.73	

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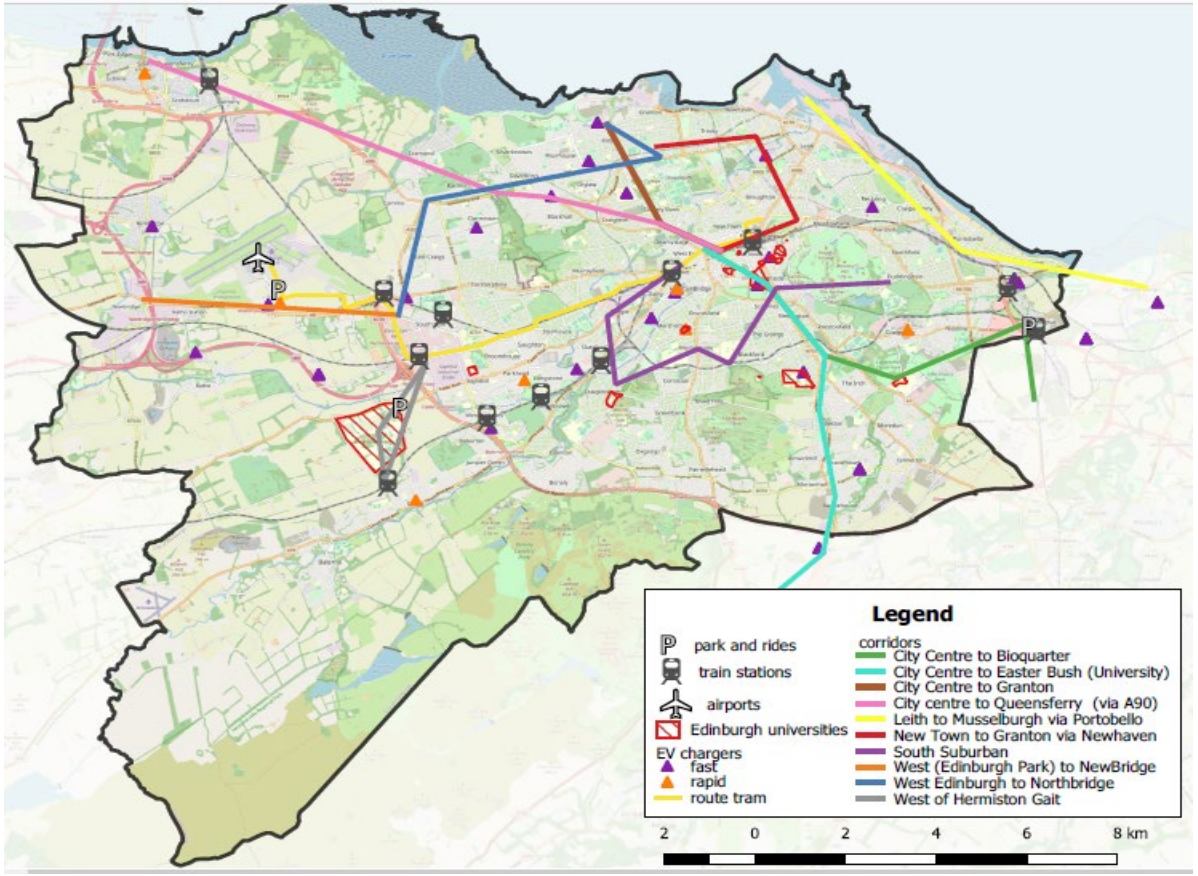
Parking bays

- On-street & Off-street parking bays (park and ride).
- Key locations.
- “The reasonable walking distance to a car club” ” was used to calculate the optimal distance between parking bays and then, adapt it to the case study using the “key locations”.



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EV Car clubs charge with 100% renewable energy (Edinburgh) / Parking bays

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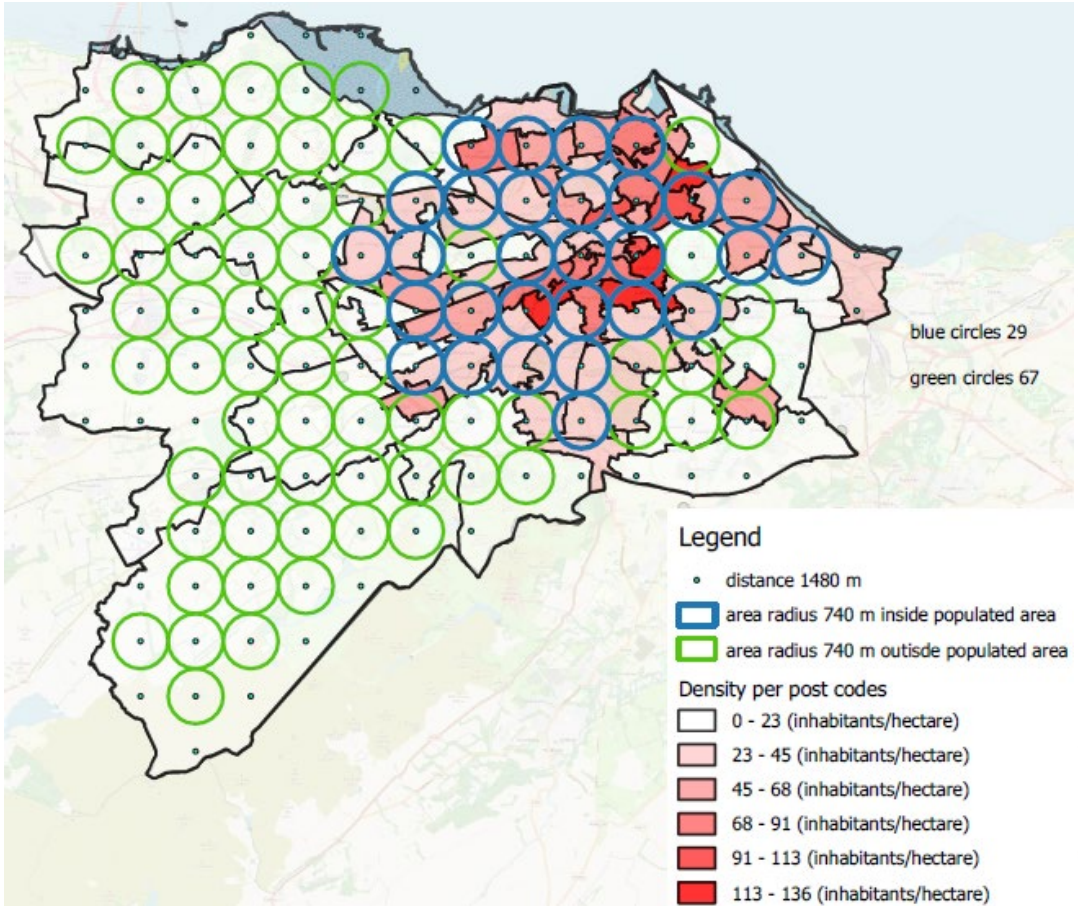
- Reasonable walking distance, 9 minutes.
- Assuming an average walking speed of 1.37 m/s the optimal distance to a parking bay should be 740 meters.
- In highly populated areas vehicles are booked more.
  - ✓ Maintain 740 m.
  - ✓ Double it in less populated areas.



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EV Car clubs charge with 100% renewable energy (Edinburgh) / Parking bays

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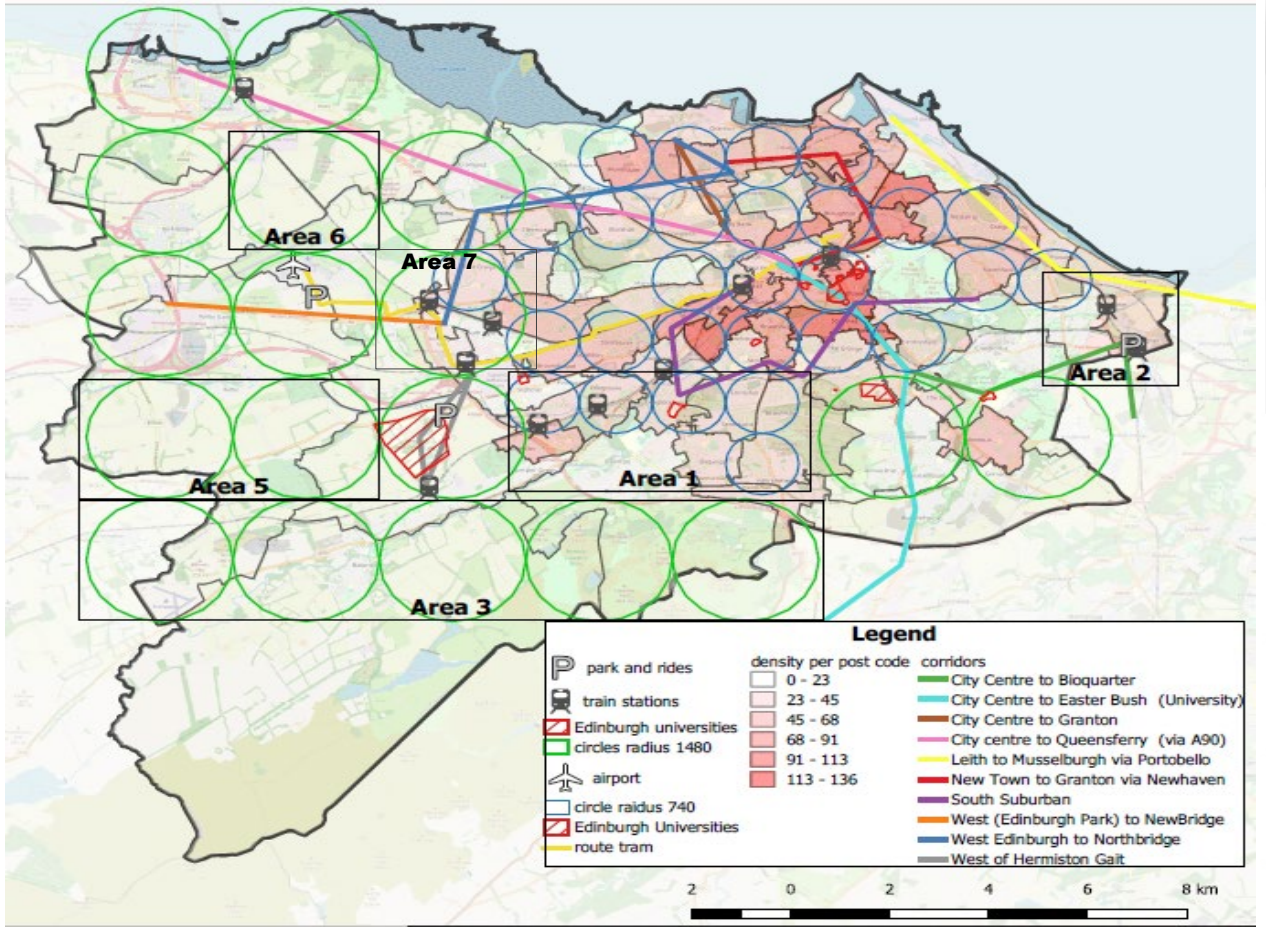
- The areas outside the populated post codes (green) will be analysed considering the key locations.



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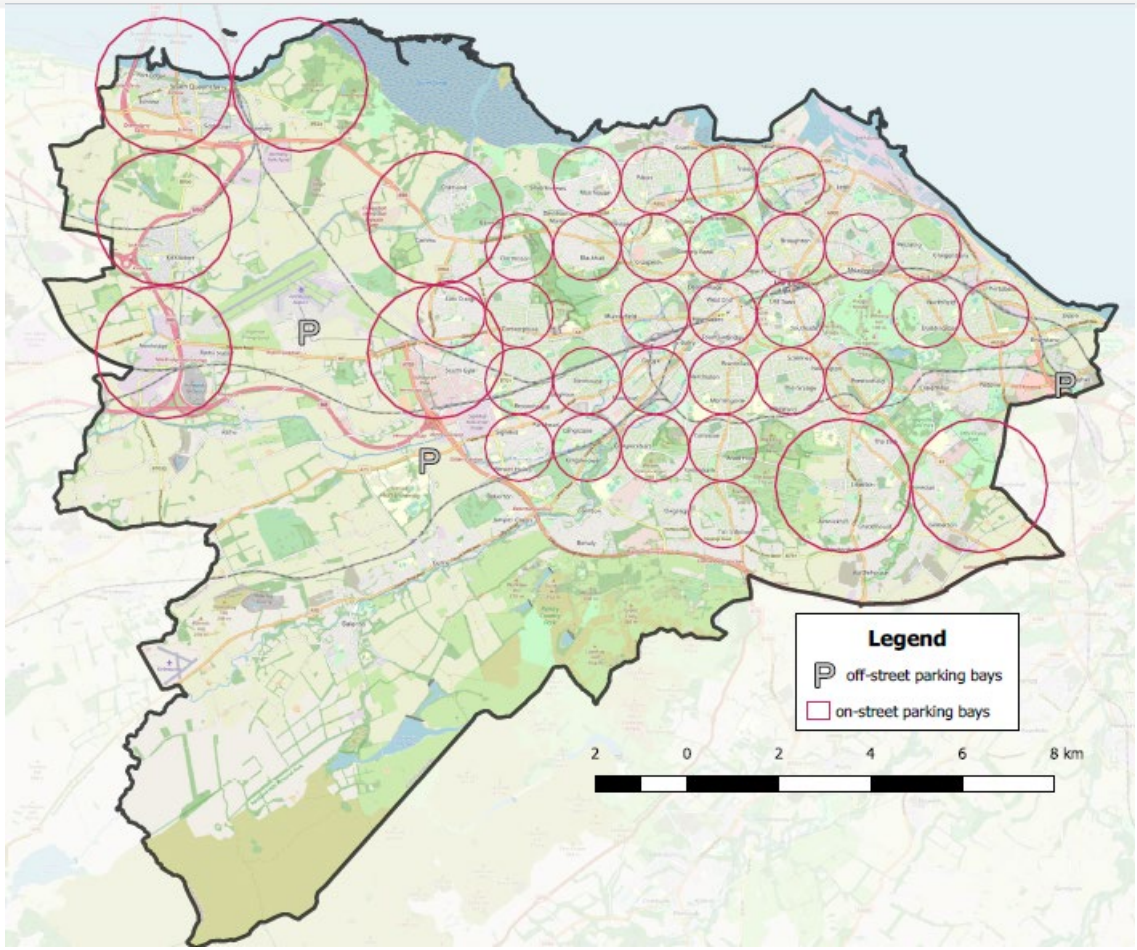
EV Car clubs charge with 100% renewable energy (Edinburgh) / Parking bays

- There will be 40 parking bays, 37 of them on-street and 3 off-street.
- 320 parking spaces.
- Parking bays will be the charging points.
- Chargers, conventional rapid (50 KW).
- 80 chargers to ensure 160 charging points. (2 sockets each).



100% renewable energy- How?

- Renewable self-consumption isolated from the grid with storage installation.
- Renewable installation connected to the grid to cover, at least, the demand - Ofgem issue the REGO.(Renewable Energy Guarantee of Origin)
  - ✓ PPA with an energy generator/utility.
  - ✓ Construct a renewable installation to export electricity to the grid.

Energy analysis

- Electric demand from car clubs will be covered with wind turbine generation (250 KW WES).
- Solar is an extra (Solar canopies in Ingliston Park and Ride) (350W Canadian Solar).
- The electricity will be exported to the grid – certified with REGO

Energy analysis - Wind

- Weibull distribution to calculate the frequency of wind speed.

Year	Energy production (MWh)	Full load hours	Capacity factor
2015	858.53	3,434.12	39%
2016	678.24	2,712.96	31%
2017	746.89	2,987.56	34%
2018	723.28	2,893.12	33%
Average	**751.74**	**3006.94**	**34%**

- The energy demand 729.73 MWh and the average energy production from the wind turbine will be 751.74 MWh.

Energy analysis - Solar

- Hourly solar data.
- 2 solar canopies - 5 x 12 panels each.
- Energy production 38.9 MWh annually.

Total energy

- 790.64 MWh each year.

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Carbon emissions

- 1 car club replace 9 private vehicles.

WTW GHG	Emission (tonnes)			Reduction
	Edinburgh´s fleet	Reduced due to car clubs	After car clubs	
CO2	507,209.7	7,792.4	499,417.3	1,5%
NOX	575,6	8,8	568,8	1,5%
PM	20,3	0,3	20	1,5%

Economic analysis

- Income: tariff £0.2 per minute, average hiring period 1 hour and 20 minutes, income **£1,737,452.**
- Expenses:
  - ✓ 300 vehicles: 4 years lease (initial payment £540,075 + monthly fee £310 per car).
  - ✓ Electricity £145,946.
  - ✓ Others (maintenance & cleaning, insurance, app development, employees) £490,000.
- IRR 26%, NET (12 years) £1,512,845.
- **Car clubs are profitable when each car is hired at least 1h and 19 min each day.**

Conclusions

- **Benefits**: reductions in traffic congestions, use of private transport and emissions.
- The **fleet number** seems feasible in the current scenario where car club schemes are being developed in most **European cities**.
- Car clubs can generate considerable **incomes** when vehicles are **frequently hired** but are not profitable when the cars are not being driven.
- **High profit potential** that will be achieved when they reach **stability** and become a widespread service ensuring a high number of bookings.
- Charging the vehicles using **renewable energy** is a feasible option that should be considered more when introducing electric vehicles in a fleet.
- The introduction of new technologies and the use of engineering techniques are crucial pillars to develop business based on circular economy that will lead the route towards a more sustainable and efficient culture.

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Thank you for listening

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Inclusive Car Clubs – Introducing car clubs into low income neighbourhoods

Beth Morley

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Introduction

Cenex – Lowering your emissions through innovation in transport and energy infrastructure.

Challenges facing car clubs in low income neighbourhoods

Present some solutions and recommendations.

Electric Car Clubs

We know why -

- 6.1 private cars are replace by car club.
- 1,997 reduction in weekly private car trips.

What is the problem?

Tend to be in large cities in affluent areas.

What about everyone else?

Challenges - Finding the space

https://www.polisnetwork.eu/wp-content/uploads/2019/09/1c_sunnerstedt.pdf

- Parking spaces – very precious.
- Restrictions in different countries
- Chargepoint locations
  - Takes a long time. DNO energy supply.
  - How to manage increasing need for charge points as electric vehicle use increases.

Challenges - Affordable and accessible

Can not rely on the pull of financial benefits - scarcity mind-set

Who are the user group?

https://www.rickhansen.com/news-stories/blog/10-ways-make-your-business-more-accessible

Challenges - Big steps and changes

Is it really easy?

Q. Have you used an electric car club?

Use of electric vehicles and chargepoint is new and different.

Booking a car clubs is new and different.

It is a lot to ask of people

Solutions - Flexible space

Different operation models

- Start with Hybrids.
- Geofence car club ‘area’.
- Using public chargepoint and community champions in Nottingham.
  - Rapid charger
  - Linking with an active community group
  - Car Park
  - Being flexible

MOZES
Meadows Ozone Energy Services

Challenges - Affordable and accessible

- No Membership costs – £10 joining fee (with £10 credit). No monthly annual subscription.
- Pay as you go – benefit of EV car club, no mileage cost. Pay by the hour with flexible rental.
- Access the vehicles – Various methods, smart phone, bank card. No need for membership cards.
- Local Support

Challenges - Big steps and changes

Crossing the intention gap -	
WISH	Desirable, something important
OUTCOME	Create a vision of modern transport
OBSTACLES	Be honest about difficulty, don't gloss over the hard bits.
PLAN	Provide support to help, start at the basics, don't assume.

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Thank you for listening

Beth Morley

Mobility Project Manager – beth.morley@Cenex.co.uk

SuSMo Webinar
Electric Car Clubs

SuSMo

12 May 2020

ENTERPRISE HOLDINGS GLOBAL

$25.9 Billion
Annual Revenue

£1 Billion
UK Annual Revenue

100,000
Employees

5,000+
UK Employees

2 Million
Vehicles

100,000+
UK vehicles

10,000
Neighbourhood & Airport Locations

490+
UK & IRE Branches

OPERATING IN 100+ COUNTRIES AND TERRITORIES

enterprise rent-a-car

National

SUSTAINABLE
FLEET & OPERATIONS

CARBON OFFSETS

193,299
metric tons of carbon offset since 2007

CLOSED LOOP RECYCLING

11.6 Million
gallons of oil recycled since 2009

TECHNOLOGY

90%
LaunchPad mobile tablet adoption within global home-city locations

SMART SYSTEMS

2,425
sites with smart HVAC systems

ENVIRONMENT

9,000
tons of tires recycled

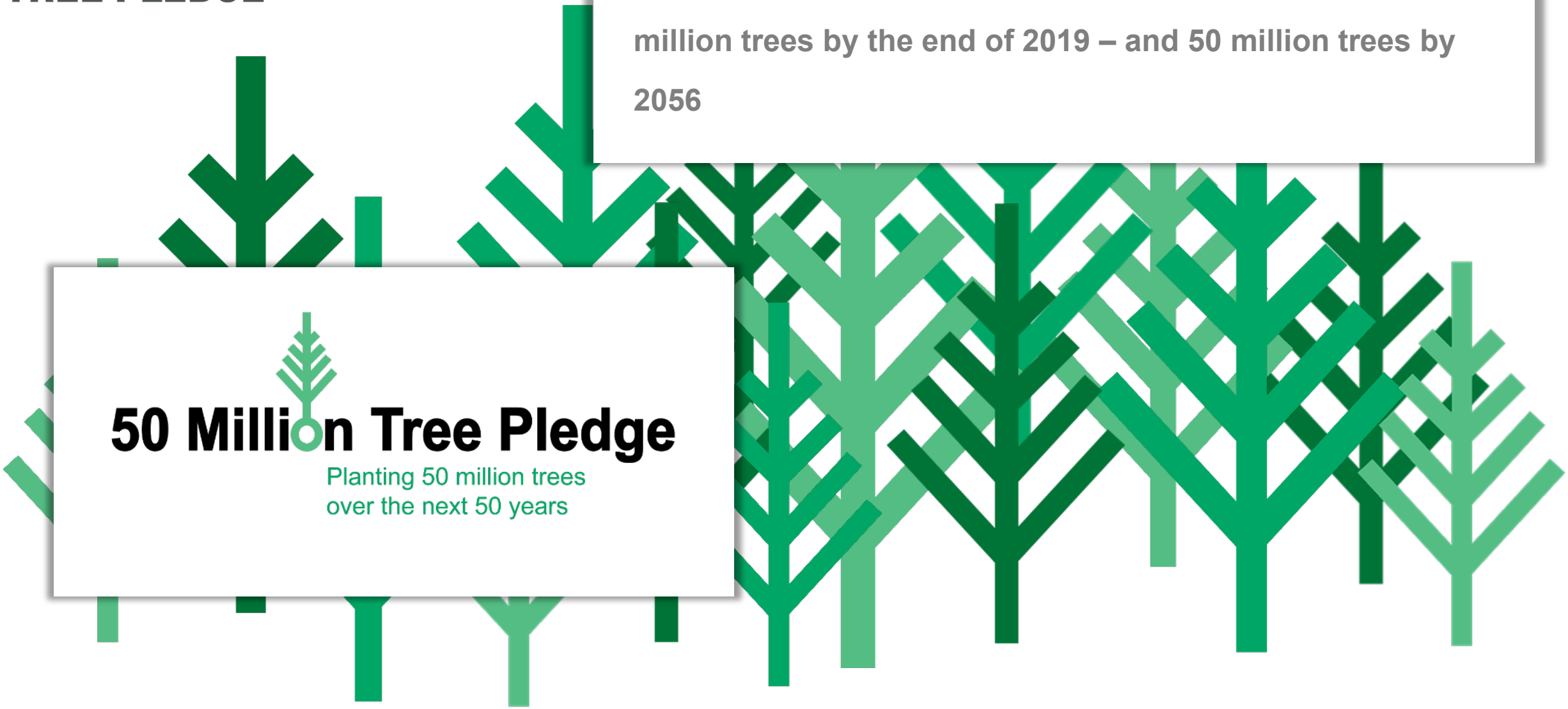
ENVIRONMENT

82,500
windscreens recycled

**as of January 2019*

50 MILLION TREE PLEDGE

The Enterprise 50 Million Tree Pledge will have planted 14 million trees by the end of 2019 – and 50 million trees by 2056



INVESTING IN TECHNOLOGY & MOBILITY

MOBILITY

CUSTOMER EXPERIENCE

FLEET MANAGEMENT & LOGISTICS

AUTONOMOUS & ELECTRIC VEHICLE TECHNOLOGY

TRAVEL TECHNOLOGY

URBAN MOBILITY PARTNERSHIP

- **The Urban Mobility Partnership (UMP)** is a coalition committed to providing long-term leadership and near-term solutions to improve future urban mobility.
- **VISION:** A UK with integrated, multi-modal national transport policy that places the needs of the consumer at its heart by reducing congestion and improving air quality.
- **MISSION:** To represent all of the key transport modes including bus, rail, coach, tram, car and bike in the debate around the future of urban mobility.
- **PURPOSE:** To provide a forum for the discussion and promotion of new policy ideas around urban mobility, including embracing the role of smart technology in the provision of mobility services that will improve air quality and consumer's lives.

- **Founding Members**
- **Partners**

INTRODUCING ENTERPRISE CAR CLUB

Largest UK Car Club network with over **1,400 automated access** vehicles available 24/7/365 to our members using our mobile app in 180 towns, cities & communities across the UK.

No Queues

No Paperwork

Unlock and GO

CONTACT-FREE CAR CLUB RENTAL

- Access vehicles 24/7 with a tap of an app – no human contact
- Choose from a wide range of low-emission vehicles from small to large, car to van, 7-seaters to EV
- *Enhanced cleaning regime in place, at this time, to ensure vehicles are cleaned between each rental booking*
- Membership includes fuel, servicing, MOTs, breakdown cover, insurance and cleaning, meaning you only pay for a vehicle when you need it, not when you don't.
- Collect vehicles from a convenient street, train station, car park or Enterprise Rent-A-Car Branch

WHY MEMBERS CHOOSE ENTERPRISE CAR CLUB

Lots of choice

- Multiple vehicles, and vehicle types, available across the UK
- Accessible 24/7
- Book by the hour or by the day
- Bookable in advance or as you need it
- Membership allows you to vehicles across the UK
- Drive from 19 years old

Easy to use

- Easy to use IOS or Android app
- Easy car pick-up with mobile app/contactless card automated access
- 24/7 helpline support via the UK Clubhouse

Affordable

- Only pay for the vehicle when you need it – unlike owning
- Low hourly & daily rates
- Rates include fuel, road tax, servicing, cleaning and congestion charge
- FREE cancellation 5hr before booking

Green

- Reduce carbon footprint with younger, greener, shared fleet
- EVs & hybrids available to rent

Member benefits

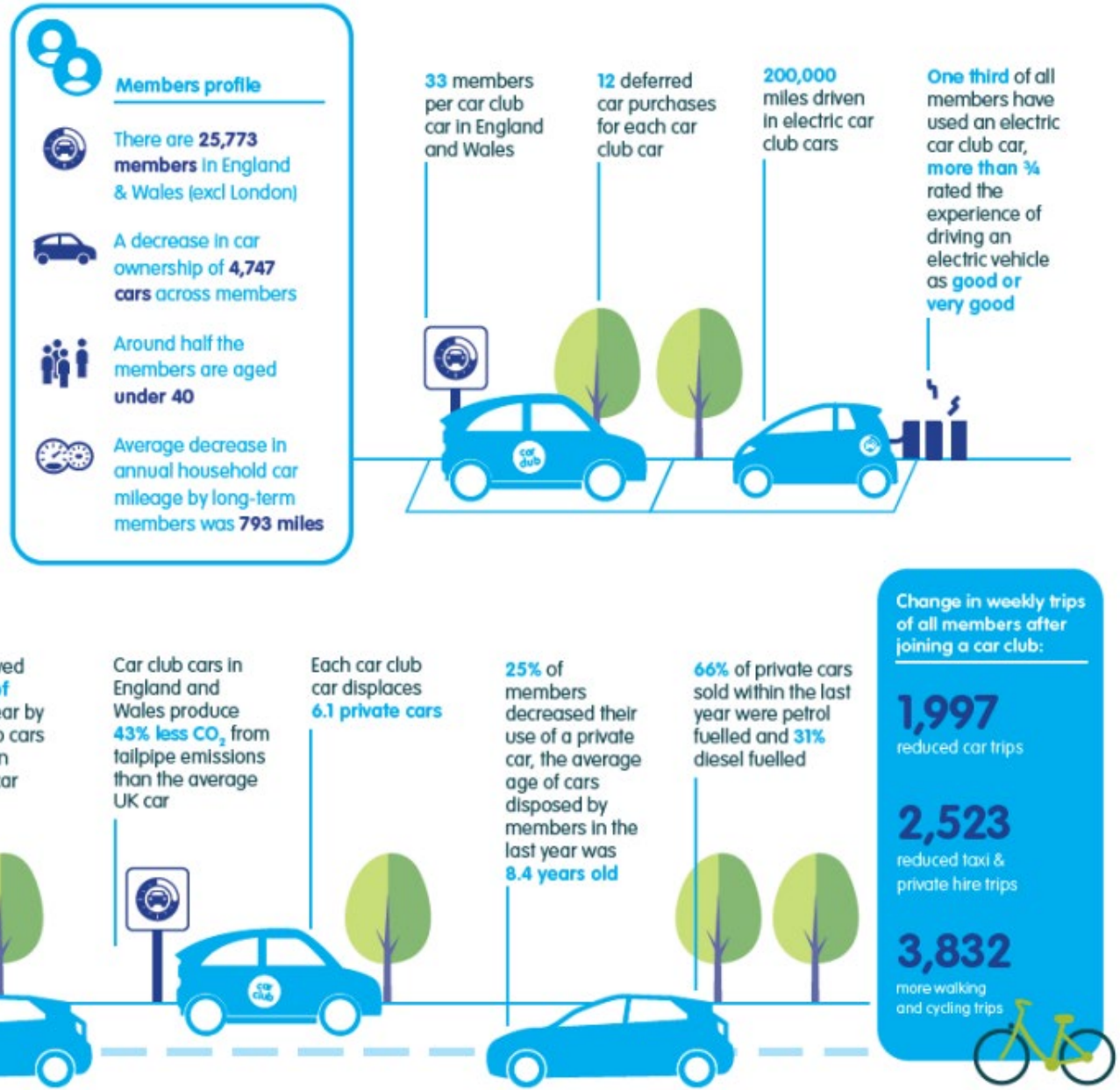
- Get 5% off Enterprise Rent-A-Car
- Discounts with 3d party partners

THE VALUE OF CAR CLUBS

comouk
supporting shared transport

England & Wales Car Club Annual Survey

This is the tenth edition of the Car Club Annual Survey for England & Wales and covers the period March 2017 – April 2018. It has been administered by Steer on behalf of Co-wheels, E-Car and Enterprise Car Club, with review by CoMoUK. The analysis is based on a members survey distributed by the three operators and operator data.



BACK TO BASE MODEL – IDEAL FOR EVs

- **Enterprise Car Club (ECC)** operates a ‘back to base’ model
- Majority of vehicles located at on-street parking bays
- Work closely with local authorities, often on a tender and/or contract basis
- Dedicated on-street bays ideal for installation of EV charging
- Largely removes issue of **‘ICEing’** encountered across wider public charging infrastructure
- Customers can check **live state of charge** of EVs on ECC app

CHALLENGES WITH EVs

- Customer education – people wary of change
- Vehicle acquisition cost compared with traditional ICE vehicle
- Range anxiety
- Unfamiliarity with charging electric vehicles
- Reliability of charging infrastructure
- Fragmented nature of charging network and need to have multiple relationships
- Local power distribution network

enterprise CarClub

SEARCH. RESERVE. UNLOCK & GO.

OPPORTUNITIES AND NEXT STEPS

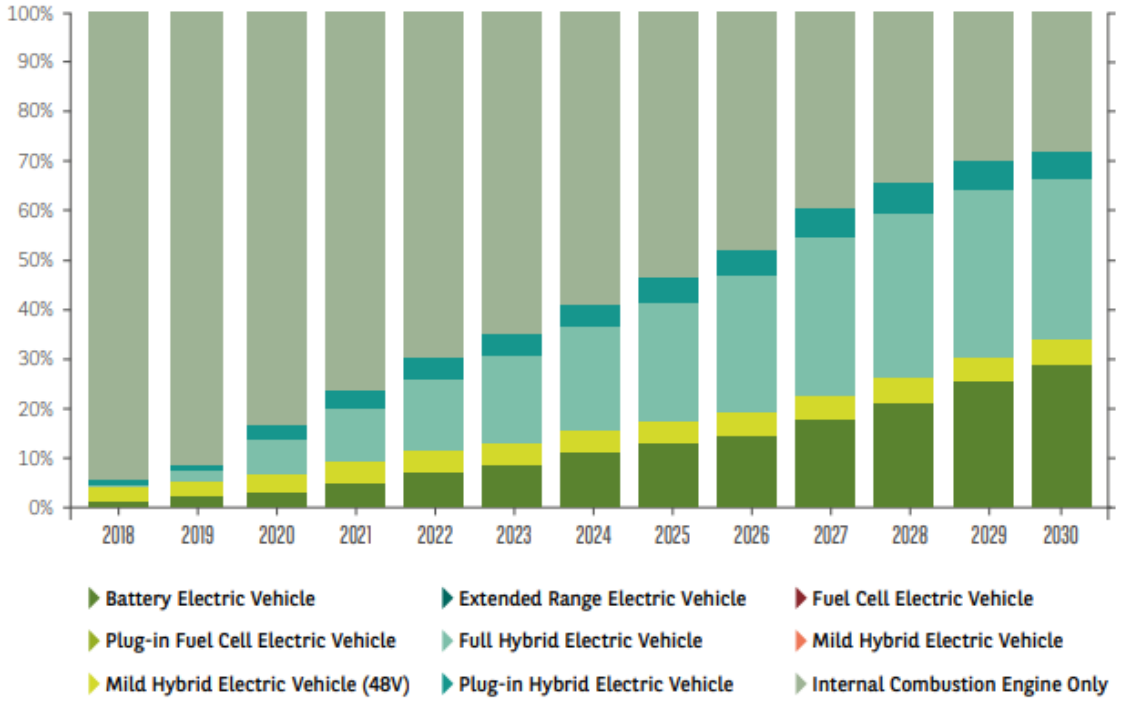
- Increasing demand from local authorities to introduce and expand car club operations generally, and increase ratio of electric vehicles
- Engagement with local authorities on pre-procurement discussions regarding service level agreements and performance indicators associated with charging infrastructure
- Increasing focus on zero emission vehicles, particularly in towns and cities introducing access restrictions and ultra low emission zones
- Contactless solution, available 24/7, 365 days per year
- Post Covid-19 sustainability & climate change focus, EU Green Deal

PREDICTED MARKET CHANGES

(pre Covid-19)

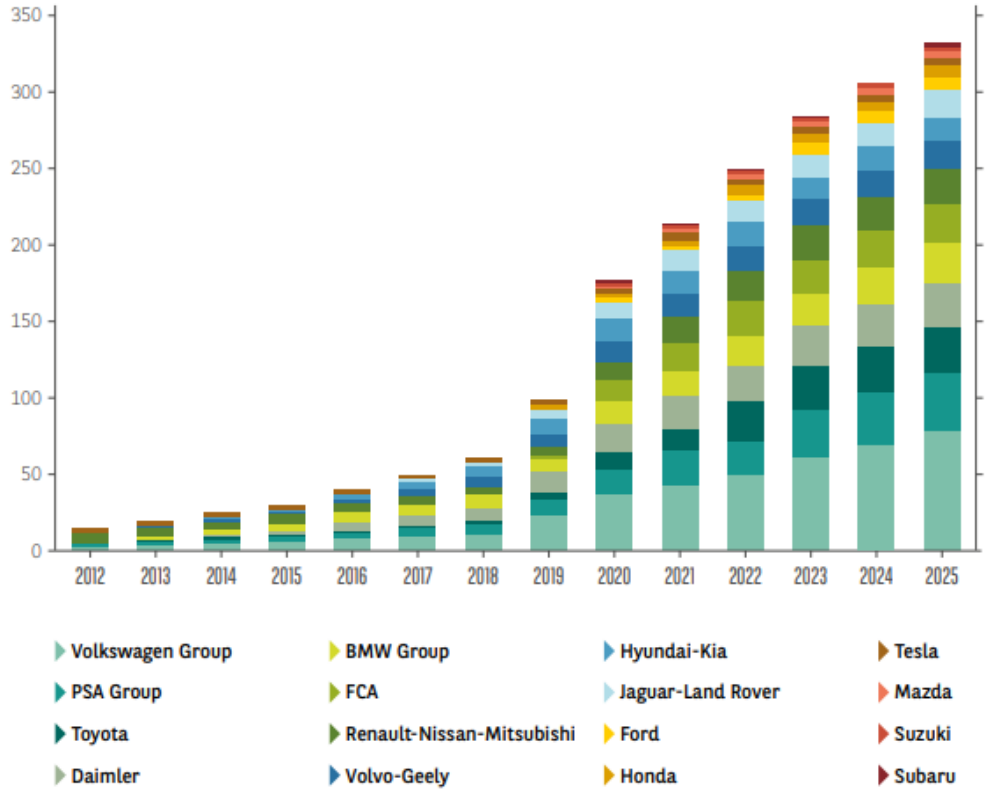
Graph 1: European registrations forecast per energy group type

Source: LMC Automotive



Graph 2: Electric car models (PHEV, BEV and FCEV) coming to the market in Europe

(source: Transport & Environment)



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THANK YOU

enterprise rent-a-car

National

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Trivector

19th May, 2 pm GMT – 3 pm GMT (4 pm – 5 pm in Sweden): *Future mobility on different sides of the Atlantic Ocean – Bridging the gap between the US and Europe*

- **Introduction**
  Axel Persson and Lennart Persson, Trivector
- **How to bridge the Silicon Valley mobility ecosystem with Europe?**
  Elias Arnestrand – Head of the Future Mobility initiative, Nordic Innovation House in Silicon Valley.
- **This is how San Francisco and San José deal with shared mobility – experiences and good practices from the US West Coast**
  Alex Demisch, Data Analytics & Strategy Manager, San Francisco MTA
  Ramses Madou, Planning, Policy, and Sustainability, San Jose DOT & Vice-Chair of the Board, Open Mobility Foundation

Ramses Madou and Alex Demisch will present how City of San Jose and City of San Fransisco are approaching shared mobility and emerging modes of transportation on the innovative landscape of the US West Coast. They are both engaged in Open Mobility Foundation and will share their views on the city's new role in a new digital landscape of shared mobility.

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Thank you for listening

Beth Morley

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If you wish to listen to the recording please contact us.