



# **CAN ELECTRIC BIKES EMPOWER FUTURE MOBILITY SOLUTIONS?**

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# OUTLINE

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- ❖ **Definitions and aims**
- ❖ **Data collections in China and the UK**
- ❖ **Results**
- ❖ **Conclusions**

# DEFINITION 1: ELECTRIC BIKE

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**E-bike** refers to bicycles that have a small electric motor paired with rechargeable batteries to assist the power provided by the user of the bike. To be defined as an e-bike, the vehicle must retain the ability to be pedalled by the rider. This distinguishes e-bikes from electric scooters (e-scooter).



Battery

Pedal

Conventional  
Bike: C-bike

# DEFINITION2: BIKE SHARING

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**Bike Sharing** – a service or a setting where bicycles are pooled for use by many, such as workplace pool bikes, community bike hubs, peer-to-peer bike sharing, or

## Public Bike Sharing Schemes

A service in which bicycles are made available for shared use to individuals on a very short term basis. It allows people to access the bike from point “A” and return it to point “B”.

# AIMS

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- **Identify barriers to and enablers of cycling through user experience**
- **Explore the potential of e-bikes as future mobility solutions**

# DATA COLLECTION

Method	Country	Gender	E-bike	Scooter	C-bike	Total
Questionnaire	China (Nanjing)	M (n=169)	18%	34%		53%
		F (n=150)	26%	21%		47%
		<b>Total (n=319)</b>	<b>143</b>	<b>176</b>		<b>319</b>
	UK (North East)	M (n=16)	22%		28%	50%
		F (n=16)	9%		41%	50%
		<b>Total (n=32)</b>	<b>10</b>		<b>22</b>	<b>32</b>
Focus Groups	UK (North East)	M (n=10)			42%	42%
		F (n=14)	8%		50%	58%
		<b>Total (n=24)</b>	<b>2</b>		<b>22</b>	<b>24</b>

# SAMPLE COMPARISON

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- **China (n=319):** all live in urban area, average age=35 (SD=11.5), 45% e-bike and 55% e-scooter users, modal shift: 44% from car/taxi and 32% from PT.
- **UK (n=32):** 80% live in urban vs 20% live in rural, average age=55 (SD=17.6), 33% e-bike and 67% c-bike users.

# IMPORTANCE OF CYCLING

<b>E-bike &amp; E-Scooter (China and UK)</b>	<b>C-bike users (UK only)</b>
<b>Allow door-to-door journeys</b>	<b>Healthier</b>
<b>Avoid stuck in traffic jam</b>	<b>More enjoyable</b>
<b>Easy to park</b>	<b>Allow door-to-door journeys</b>



# DURATION OF JOURNEY

Journey Duration	Bike	Country	Range (minute)	Mean (minute)	Standard Deviation	Sample size
Shortest	E-bike & Scooter	China	1-60	10	7.3	319
		UK	2-20	10	6.4	10
	C-bike		5-90	23	24.8	20
Longest	E-bike & Scooter	China	10-240	43	27.7	319
		UK	20-360	74	116.2	10
	C-bike		25-360	135	112.9	20
Average	E-bike & Scooter	China	5-90	23	12.7	319
		UK	10-60	26	16.4	10
	C-bike		15-160	55	47.0	20

# FOCUS GROUP – MORE CYCLING?

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- **Infrastructure and Environment**
  - Poor status of road surface: e.g. potholes, drains, debris, subsidence
  - Feeling unsafe cycling on the road
  - Lack of consistent cycle lanes and clear signage
  - Lack of good facilities at destinations (e.g. showers, changing room)
  - Traffic, road emission and noise
  - Lack of clear rules and enforcement on where cycling is allowed
- **Accessibility and Health**
  - Affordable e-bikes with choices, e.g. power-assisted braking for arthritic hands.
  - Strong desire for the local authorities to organise social events that provide education and opportunities to practice in safe and secure places
  - Unaware of cycle routes
  - Desire for more bike sharing schemes available and affordable
  - Better understanding of ways to increase health benefits

# LESSONS TO LEARN FROM CHINA

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Chinese government public consultation: cap the number of shared bikes and rule out shared e-bike scheme

- **Lack of legislations and enforcement:** many existing e-bikes exceeding the allowed top speed (20km/h)
- **Safety concerns:**
  - Rider - Lack of education and road safety training for riding heavier and faster e-bikes has led to many road accidents and costs to economy.
  - Infrastructure – lack of fire protection built into charging facilities could lead to hazardous events.
  - Bicycle - lack of proper maintenance is a safety risk.
- **Environmental concern:** Lead-acid battery disposal.

# KEY MESSAGES (UK CONTEXT)

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- **Create a safe cycling environment and prioritise cycling**
- **Encourage more bike-sharing schemes**
- **Strengthen bicycle industry, in particular, the manufacturing of e-bikes**
- **Increase the awareness of health benefits associated with cycling**

# FUTURE MOBILITY SOLUTION?



In 1973, 13-year-old Carl pushed his bike up the hill as part of the iconic Hovis advert



44 years on, Carl has done it again... but this time on an electric bike

# THANK YOU FOR LISTENING

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