

# Bristol GA Conference 2014: Urban Transport Solutions

## Collective Mobility Solutions for Urban Transport Problems

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University of the  
West of England

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# Overview

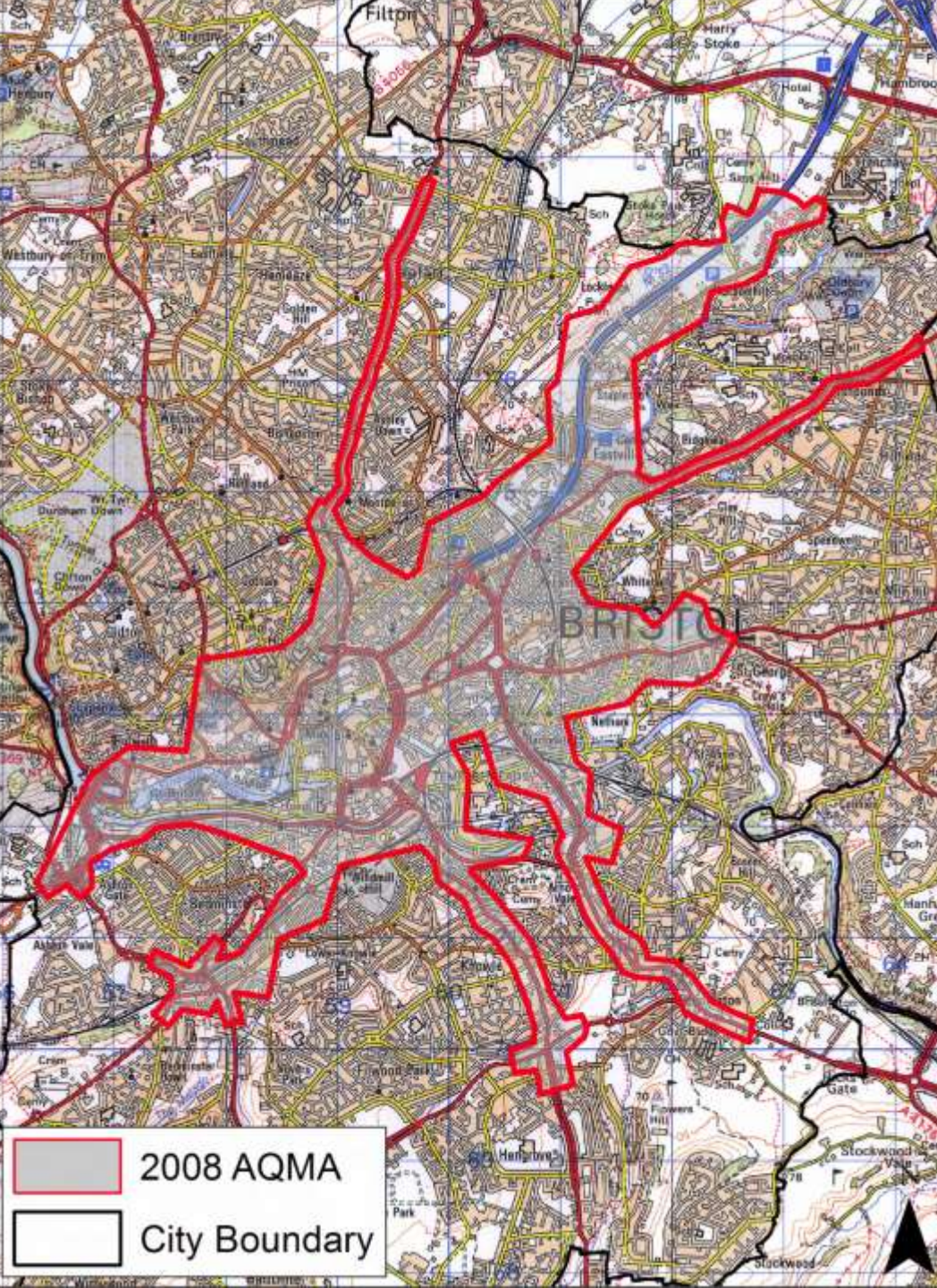
- What are the urban transport problems?
- How effective are the existing alternatives?
- Can we use the urban transport system more efficiently?
- Collective mobility as a third alternative to public and private transport

# **1. WHAT ARE THE URBAN TRANSPORT PROBLEMS?**

# Urban Transport and the Environment

- Transport
  - Competition for road space (congestion)
  - Competition for parking space
- Environment
  - Local: air quality, visual intrusion
  - Climate change

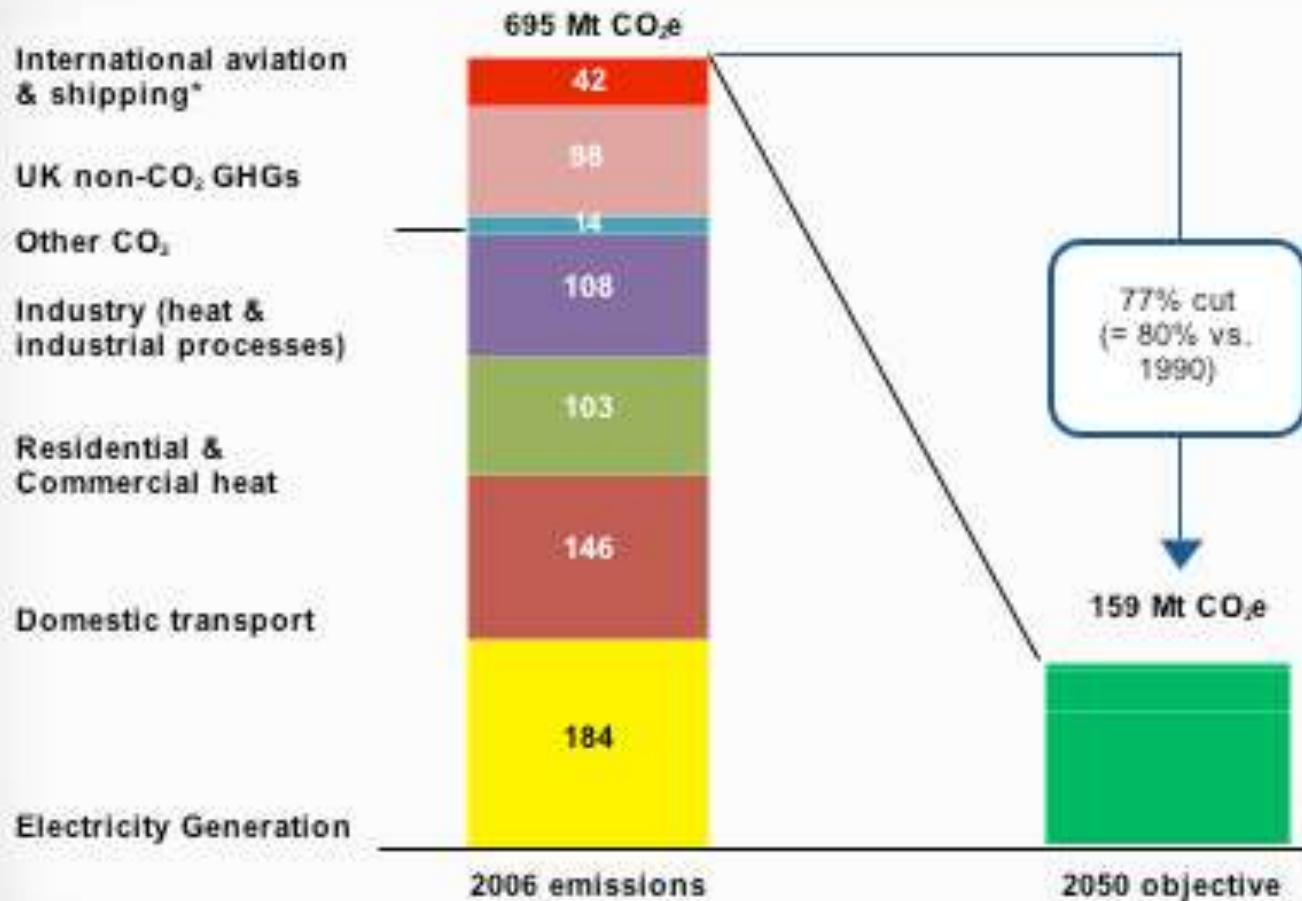




# 2008 Bristol Air Quality Management Area

# UK Low Carbon Transition Plan (2009) 80% cut on 1990 by 2050

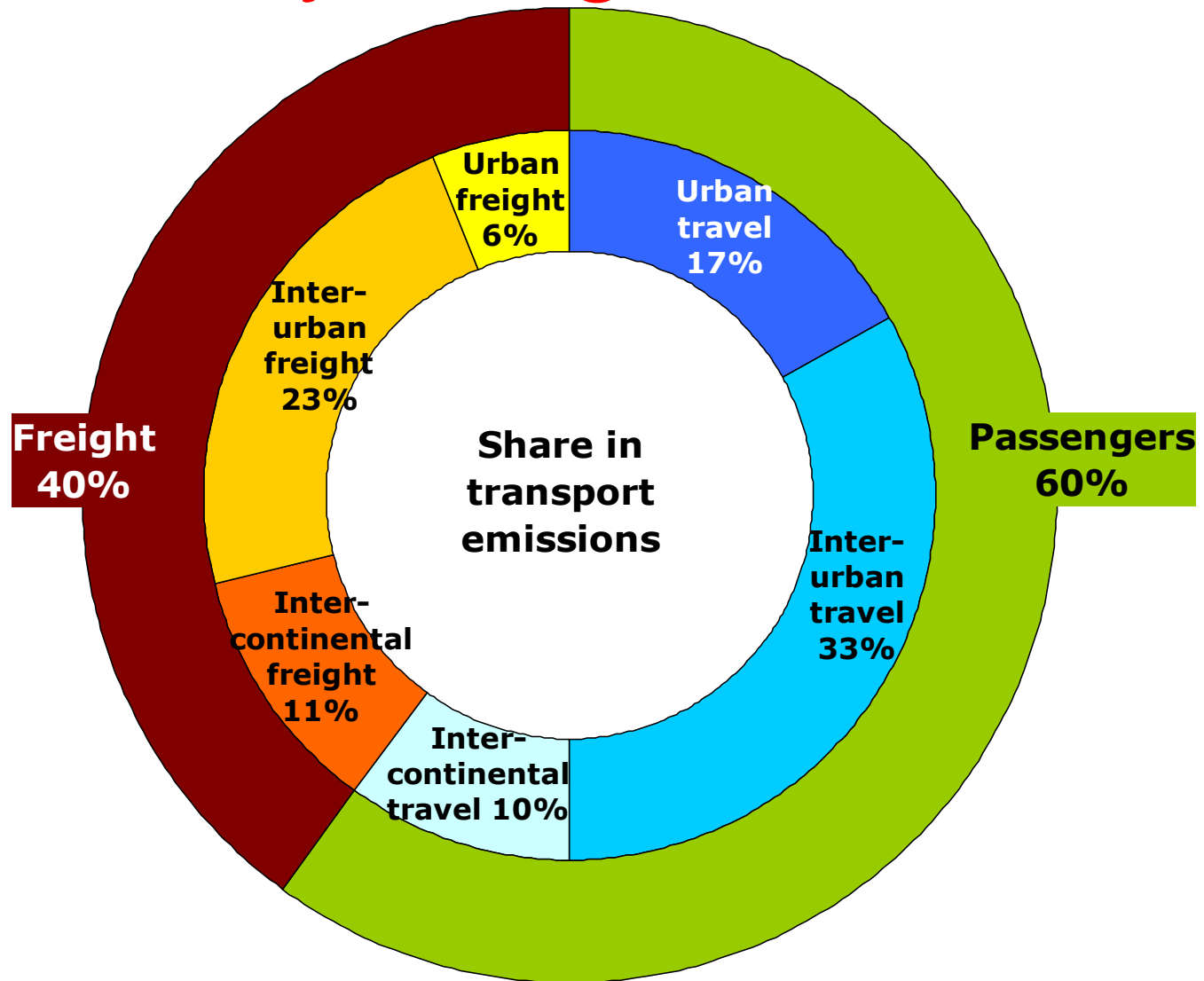
The scale of challenge



\* bunker fuels basis

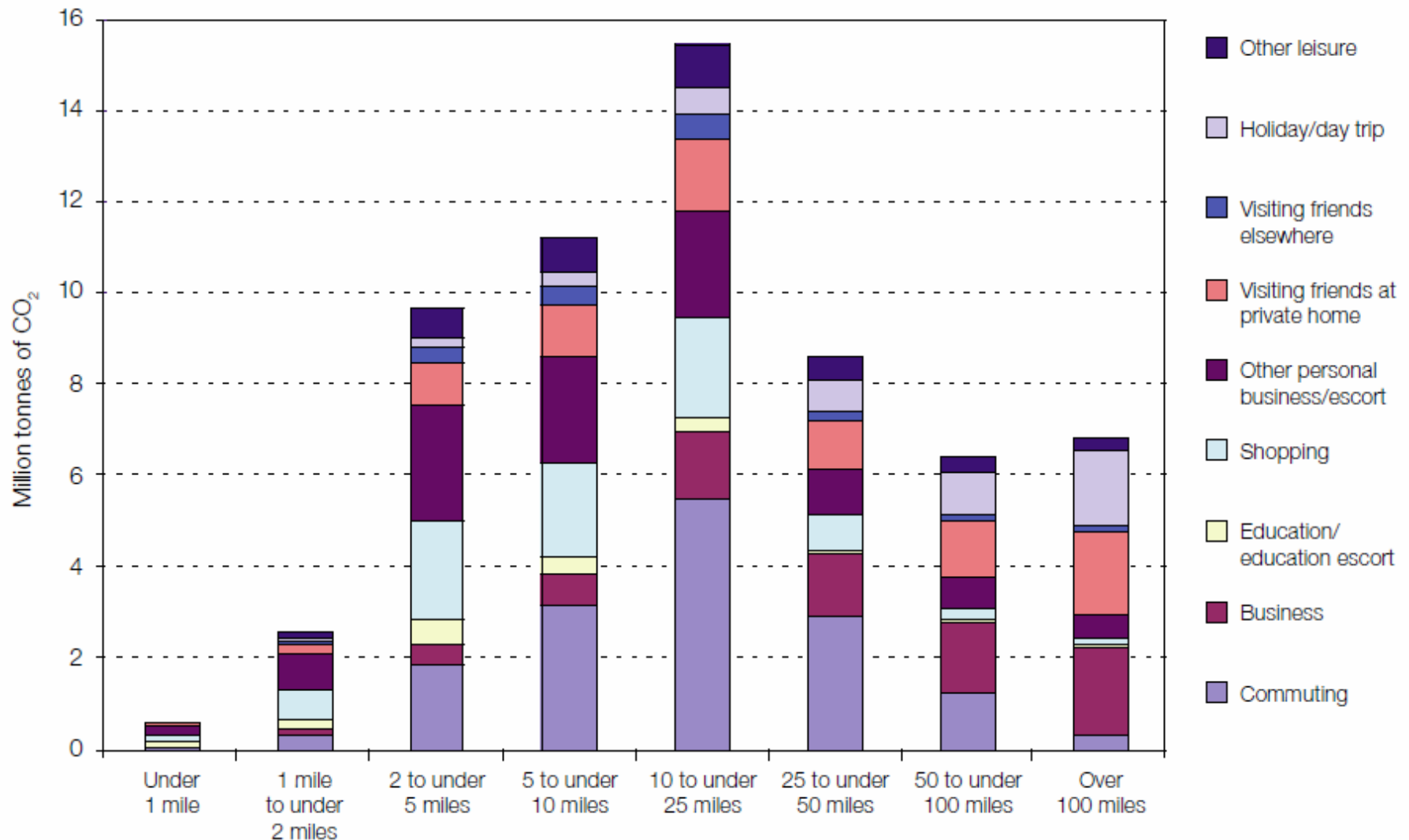
Committee on  
Climate Change

# EU Transport CO<sub>2</sub> Emissions: All Modes by Range





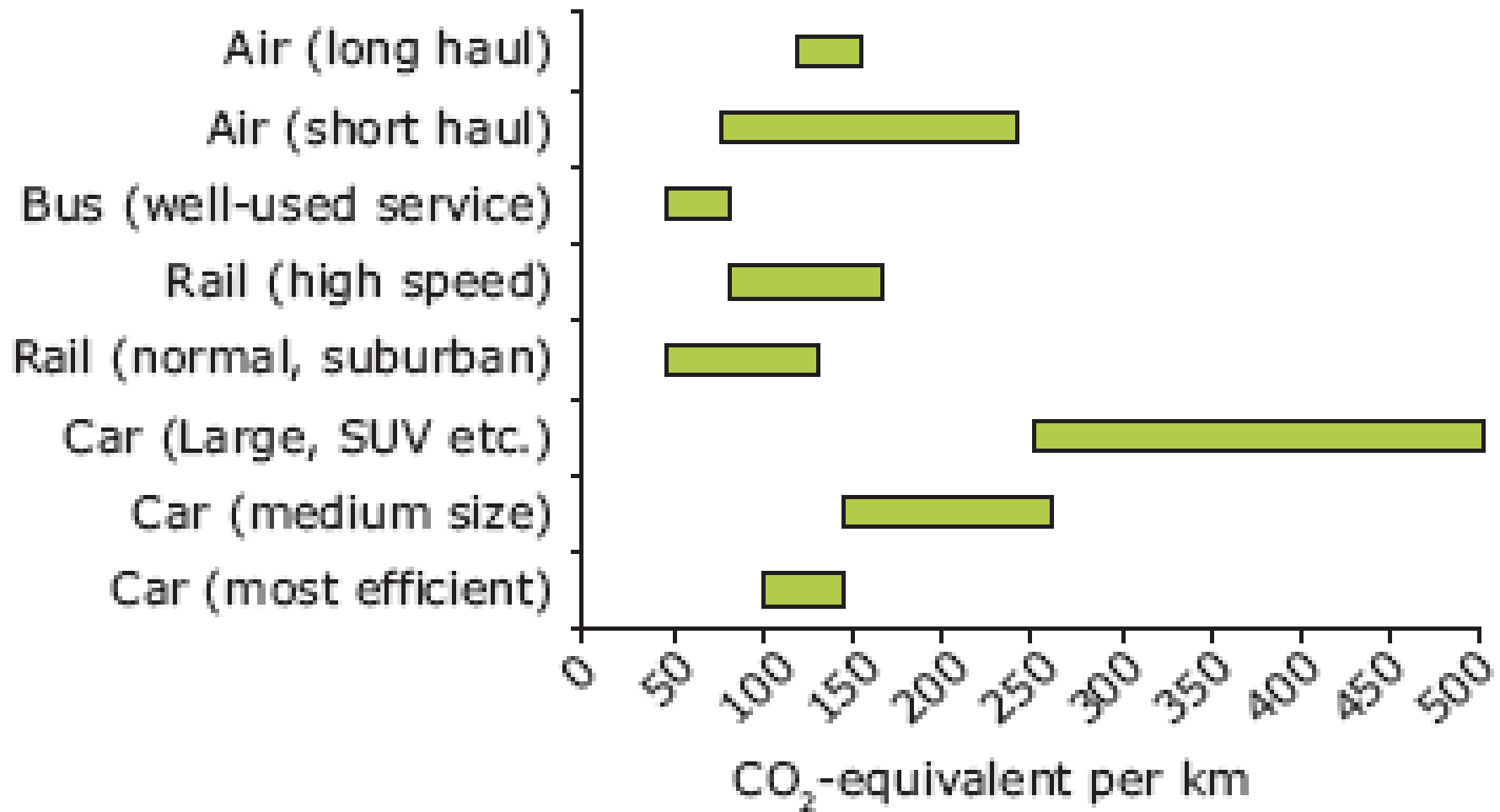
# Importance of medium range car trips for carbon emissions



Source: Department for Transport (2009) Delivering Sustainable Low Carbon Travel. Figure 2.1



# Climate Change Emissions By Mode of Transport



# Hydrogen Fuel Cell Hybrid 'in fashion again... but FAR from commercial application



# Electric cars



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# Electric cars: the unresolved questions and issues

- Source of carbon-neutral electricity?
- Distribution capacity?
- Availability of rare raw materials?
- Accommodating recharging capacity
- User acceptance of vehicle costs and characteristics
- Impact on tax revenues

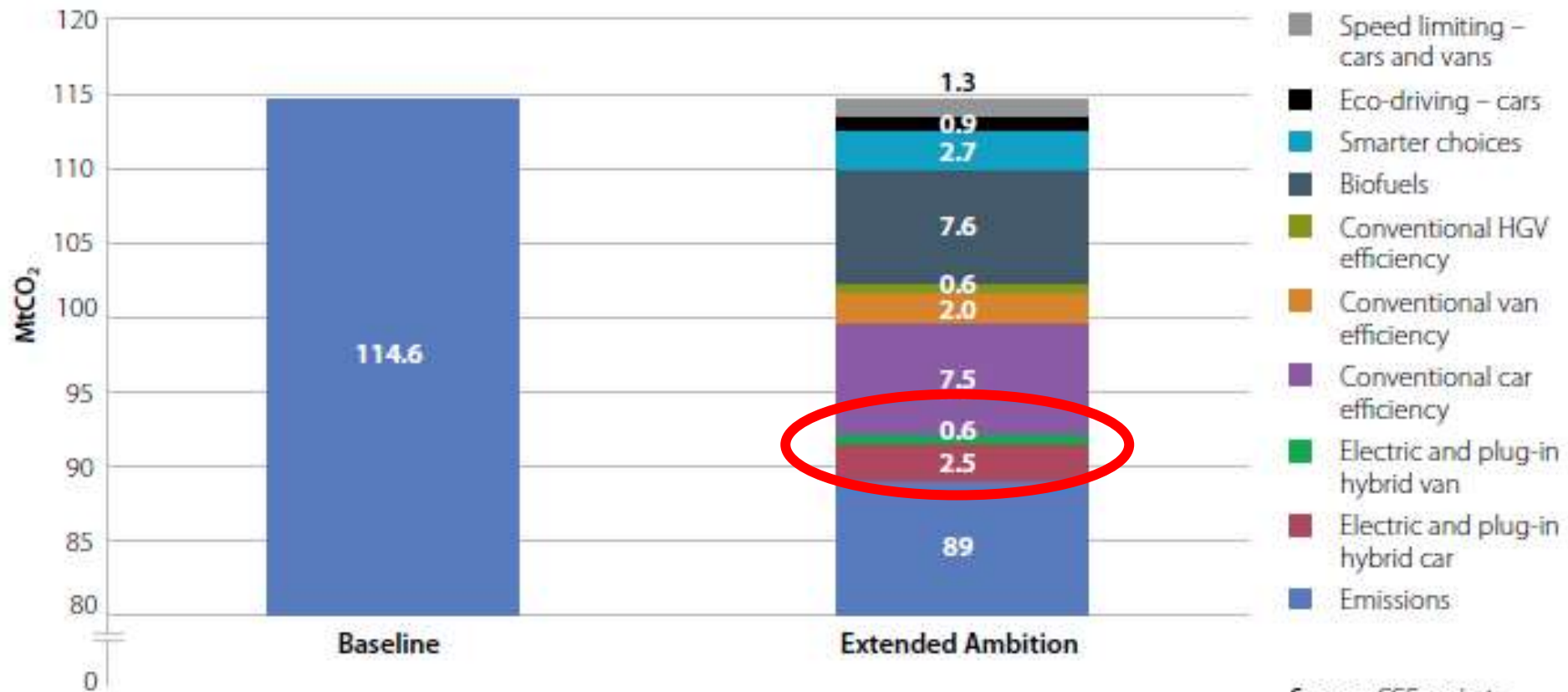


How to recharge all  
these cars?



# Too Little Too Late?

Ecars worth -3.1% road transport emissions reduction by 2020



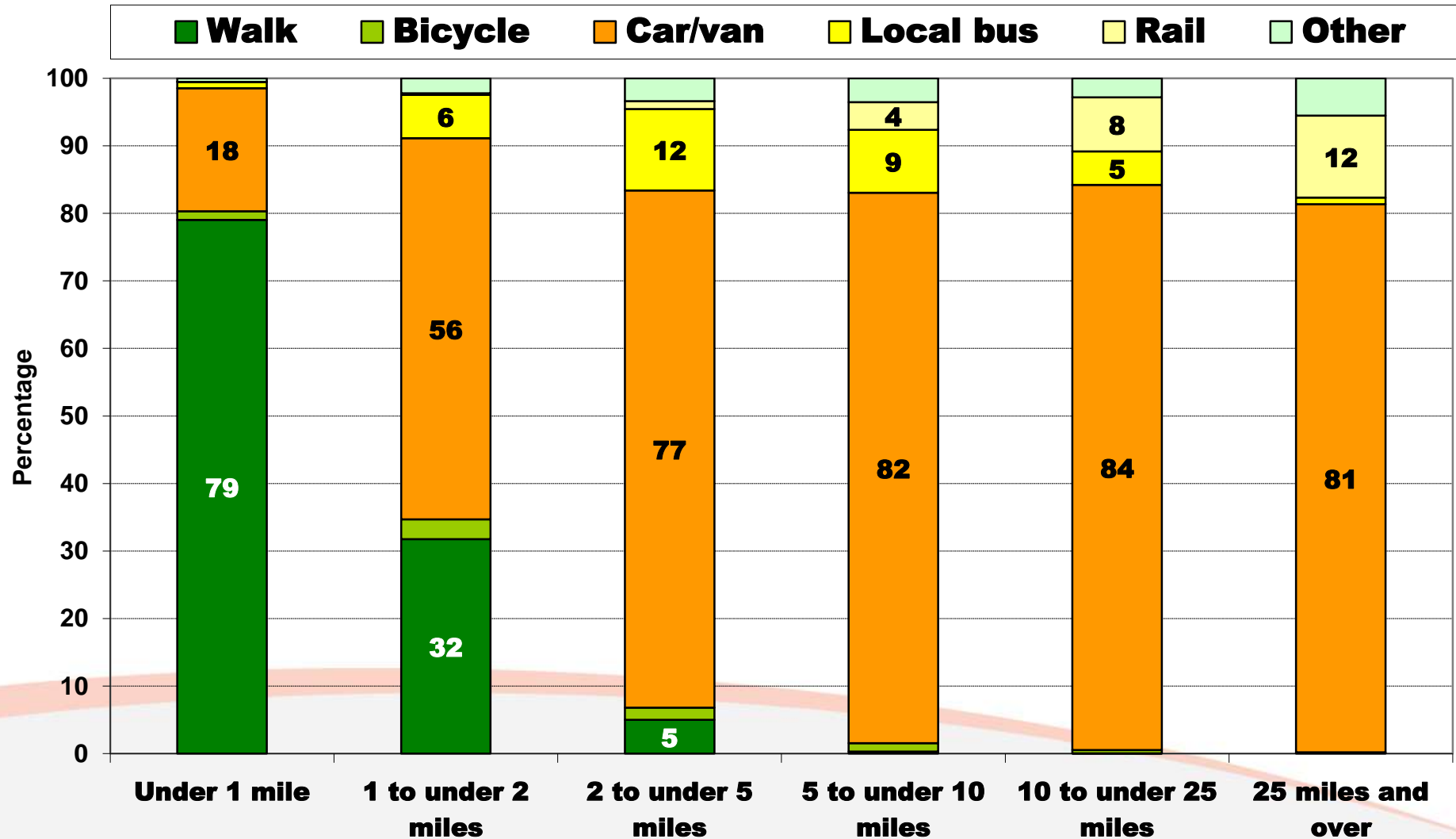
Source: CCC analysts.



**So we either need to travel a lot less, or travel very differently (or some combination of the two)**

## **2. HOW EFFECTIVE ARE THE EXISTING ALTERNATIVES?**

# Trip Length & Use of Different Travel Modes



DfT (2010) Trips by length and main mode: Britain, 2009

# Buses

- Mostly 40-70 seat
  - However full the bus is!
- fixed route and timetable
- Most effective for
  - Suburbs designed in pre-car era
  - Busy times of day/week

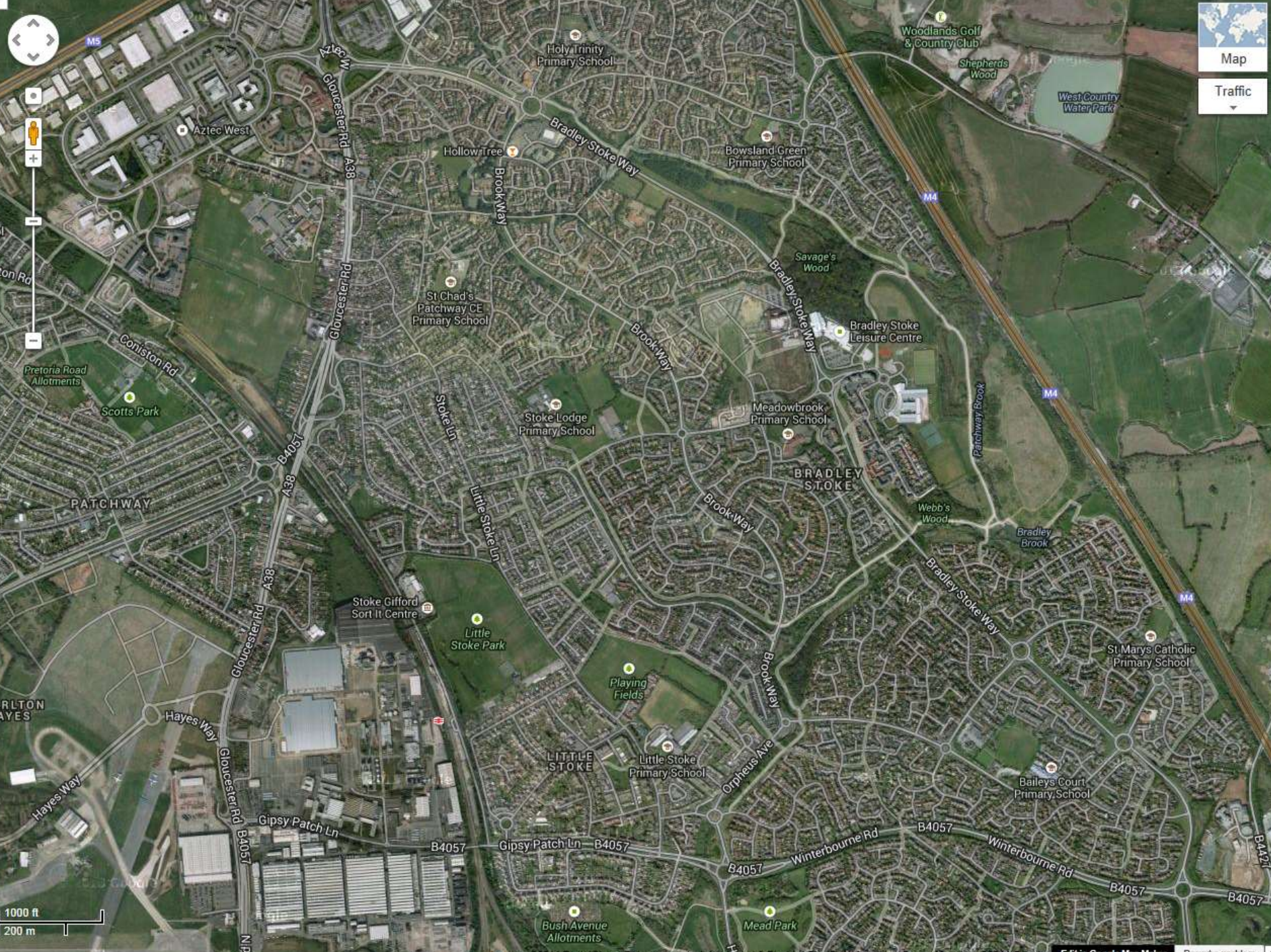
# The network is already quite comprehensive

- 96% households within '13 minutes walk' of a bus stop with an hourly service
  - 85% within 6 mins
  - Even 69% rural households within 6 mins!
- Commercially viable network mostly already identified
  - New routes to existing development would tend to be less efficient than existing routes
  - Additional routes will need subsidy!









  
Map

  
Traffic

1000 ft  
200 m



Car-oriented development signals  
that car availability is expected



# Bristol 'Showcase' Approach to Improving Existing Routes

- Priority measures
  - Bus lanes
  - Selective Vehicle Detection at traffic controlled junctions
  - Camera enforcement
- Satellite tracking to provide information to:
  - Significant bus stops
  - SMS text and web
- Modern Bus stops
  - Low floor kerbs at stops
- Driver training
- Bus information strategy
  - new formats to public, businesses
  - mailing to households

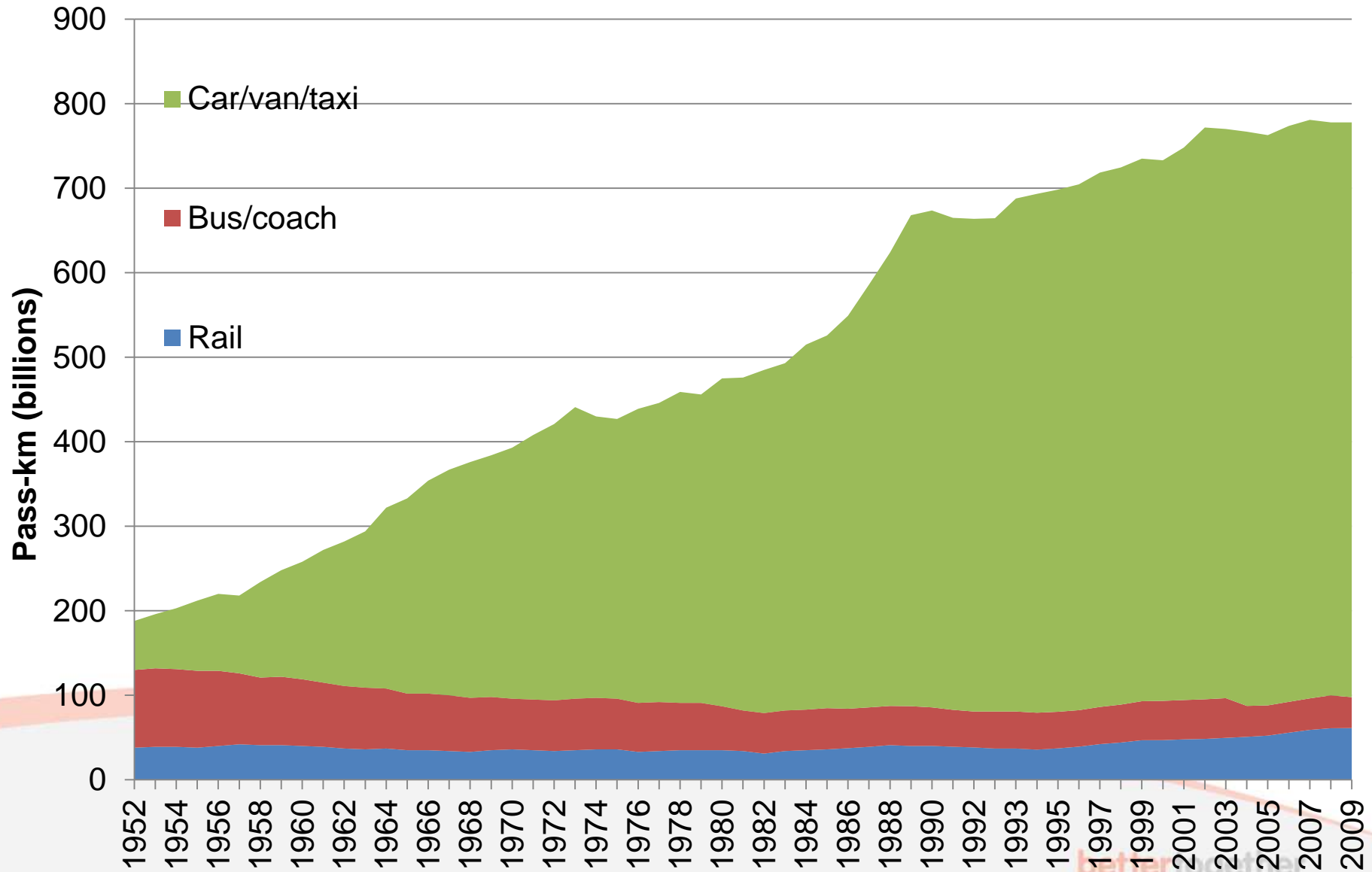




# Cambridgeshire Guided Busway



# A doubling in bus use would be good, but not overall affect the dominance of cars



Data: Department for Transport (2010) Transport Statistics Great Britain. Table 1.1

### **3. CAN WE USE THE URBAN TRANSPORT SYSTEM MORE EFFICIENTLY?**



# How efficiently do we use cars?

- Approx. 30 million cars and vans for 60 million population
  - car occupancy for commuting about 1.2 people (25% utilisation)
  - Typical car spends most of its life parked (5-10% utilisation)
  - **Overall about 2.5% utilisation**

Commercial organisations  
would not tolerate anything like  
that level of asset utilisation



**More sharing of ownership and  
use could improve efficiency**



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## **4. COLLECTIVE MOBILITY AS AN ALTERNATIVE TO PUBLIC AND PRIVATE TRANSPORT**



# Public bikes/bike sharing



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# New modes of 'private' car use

- Time options: by day/part-day/hour/trip
- Market options: commercial, car sharing, peer-to-peer (also for parking)
- Spatial options: return to origin/leave at destination





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Fuel Type

Photos

Make

Body Type

All types

All types

All vehicles

All makes

All types

Sort by: Distance (nearest first)

A



**Honda Civic Es I-vtec**

0.5 - 1 mile

**£32** per day

(£5ph £165pw £505pm)

Book



B



**Kia Sedona Ls A**

★★★★★ (2)

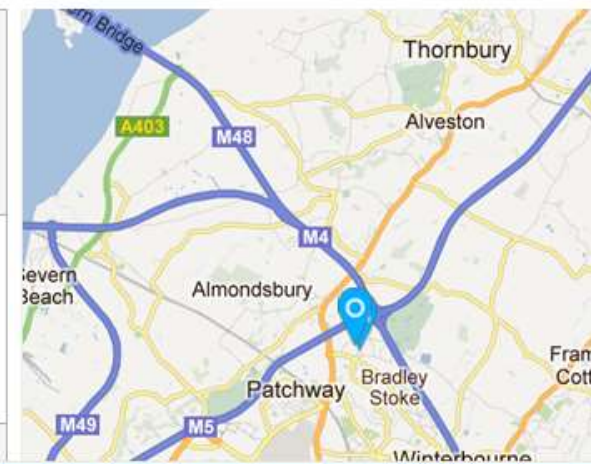
Avg response time: ~ 5 hours

1 - 2 miles

**£38** per day

(£10ph £208pw £764pm)

Book





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Location:

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Advanced

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End date

07:00



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## Carplus Annual Survey 2010/11 (Harmer and Cairns, 2011) (N=8450)

- 32% of members reduced car ownership after joining
- 54% of members did not own car before joining
- 30% said they would have bought a car if they had not joined
- Over 85% of members use car club cars less than once a month
- Car club members produce a quarter of CO<sub>2</sub> emissions of average British driver licence holder

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# Shared taxis/ taxibuses



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# Autonomous vehicles: a further possible influence on sharing





REVOLUTIONISING TRANSPORT, ONE STOP AT A TIME

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Buxi is a new commuter transport service which picks you up close to home and takes you to work.

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<http://t.co/fVVH6JYX> 02:10:30 PM  
October 01, 2012 from web  
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<http://t.co/t2eaPobd> 02:08:36 PM  
October 01, 2012 from Tweet Button  
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- What cars really cost you... Yahoo! Finance UK <http://t.co/RAXeSmhT> via @YahooFinanceUK 01:39:35 PM  
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If you think about it, Avonmouth should be bustling. It is one of the UK's major ports for chilled foods. There are also

<http://esoterix.co.uk/blog/>



# Buxi Service Attributes

- Web booking + text/email confirmation
- Collection from near home
  - Short walk to virtual bus stop
- Faster than buses
  - no fixed routes/timetables
  - More nimble vehicle (Mostly 8-15 seat?)
  - Real-time scheduling: optimise demand + travel time
  - can divert to avoid traffic
- Cheaper than car, avoids need to park
- Cheaper than taxi and shorter waiting time

# Conclusion

- Urban sustainable mobility will not be achieved by public transport, walking and cycling alone
- Collective mobility solutions are emerging
  - Need research to understand more about the policy and practical implications of each
  - Depending on findings, need to ‘steer’ the market towards the long-run optimal mix

# Thank you!

## Questions?

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