



CENTRE FOR RESEARCH INTO  
ENERGY DEMAND SOLUTIONS



# Rearranging elephants on the Titanic

Jillian Anable, Professor of Transport & Energy,  
Institute for Transport Studies, University of Leeds

 @jillian\_anable

 J.L.Anable@Leeds.ac.uk

PRESENTATION TO THE TRANSPORT PLANNING SOCIETY, 9<sup>TH</sup> JAN 2020



[www.creds.ac.uk](http://www.creds.ac.uk)

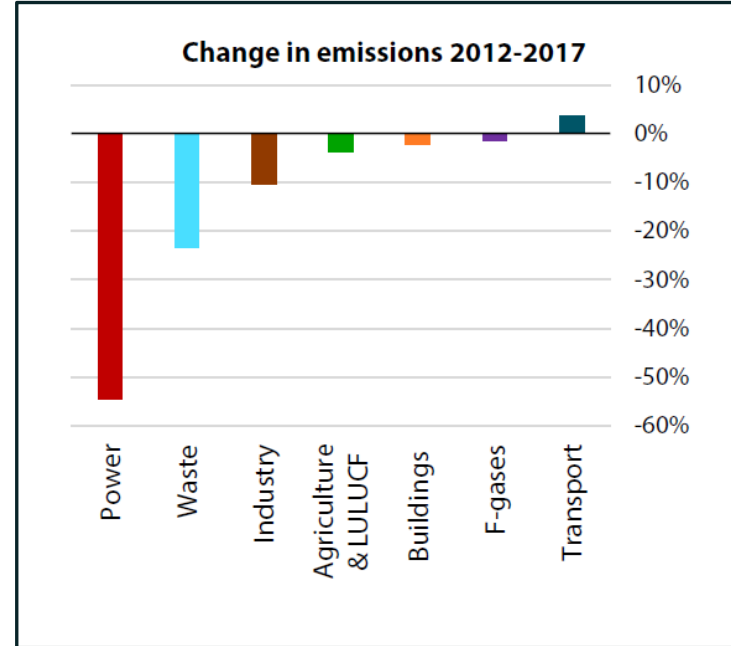
# What does the declaration of a Climate Emergency mean for the Transport Planning profession?



## Let us start with some humility ...

- Climate Change is not a NEW problem
- First IPCC report was in 1990
- In 2019, UK road transport sector emissions ~ 3% higher than in 1990
- Transport still 98% fuelled by fossil fuels (96% of road fuel)

Despite optimistic rhetoric, we have delivered 29 years of failure to reduce some of the worst consequences of motorised travel demand

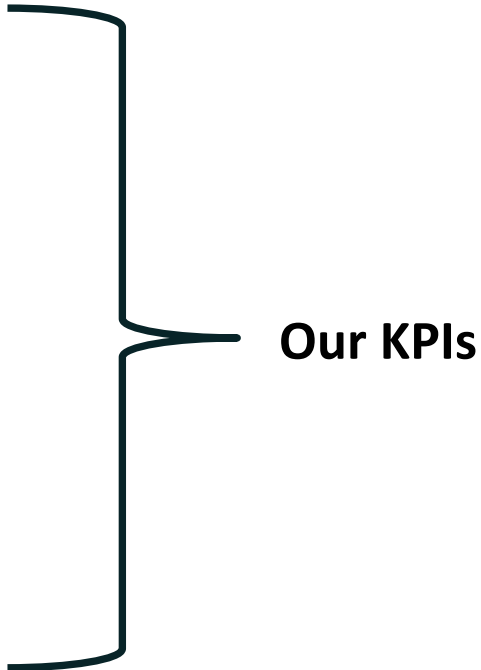


Committee on Climate Change 2018 Progress Report to Parliament



# Feeling optimistic?

- 🐘 Energy use
- 🐘 Carbon emissions
- 🐘 Local pollutants
- 🐘 Car ownership
- 🐘 Car utilisation rates
- 🐘 Congestion
- 🐘 Bus patronage
- 🐘 Active travel
- 🐘 Obesity
- 🐘 Accident rates
- 🐘 Transport poverty

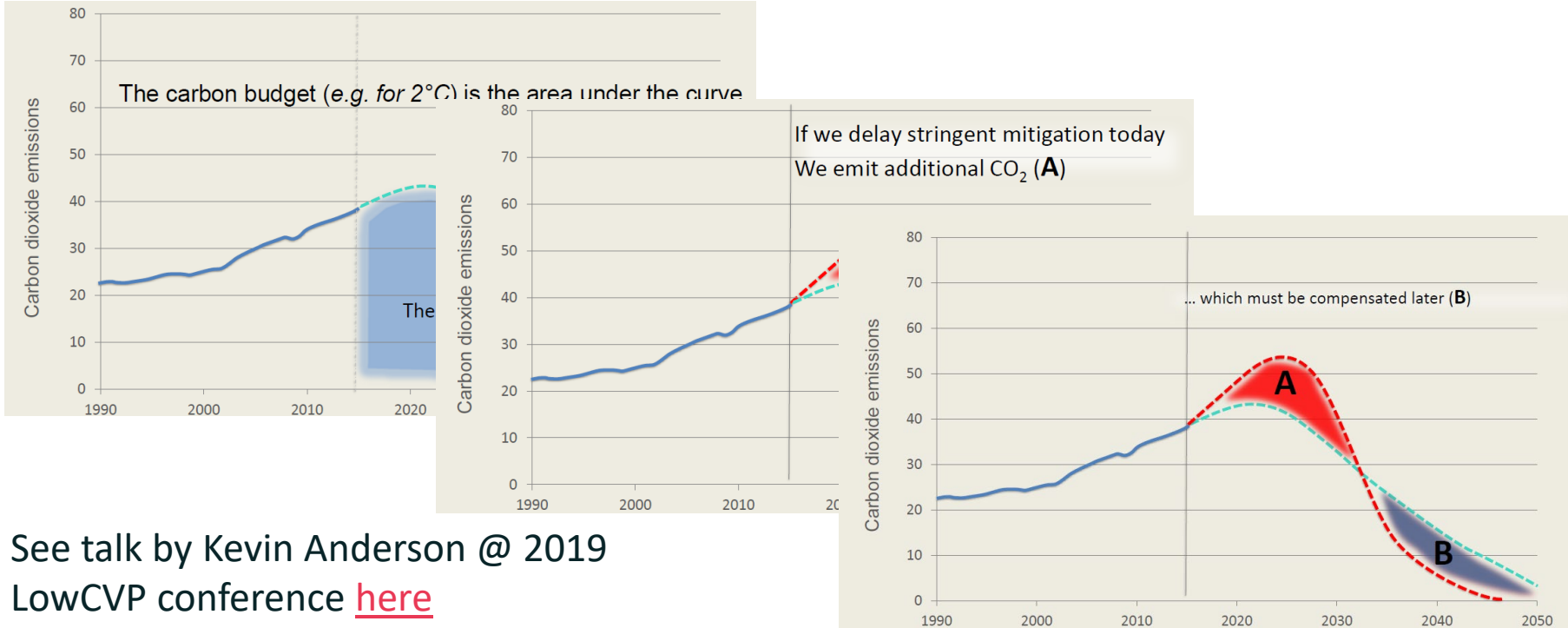


## HOW ARE YOU FEELING?






# It is carbon budgets, not long-term targets that link with temperature rise




See talk by Kevin Anderson @ 2019  
LowCVP conference [here](#)



## Some tough love

 *Why have we so **continuously and fundamentally** failed?  
...is it **wilful delusion** or well-intentioned **political pragmatism**?"*

 *We face **losing our integrity** over this issue...  
**...we need a profoundly more challenging mitigation agenda  
than the academic community has countenanced to date***

 ***BUT**, have we **left it too late**?*



# (Pre)-Traumatic Stress Disorder

## Symptoms

- Constant fear all efforts will be for NOWT
- Crippling guilt and overinflated sense of responsibility
- Self-flagellation
- Prone to sudden angry outbursts which can escalate into threats of violence if untreated
- Perverse cravings and dismissive/selfish behaviour

## Treatment

- No known cure
- Economists and Engineers have natural immunity
- Retraining as an Economist or Engineer can lead to serious side-effects
- Sufferers are advised to practice alternating episodes of making light of the situation with group therapy for anger management



## Reframing the question

- Take the Paris **“well below 2°C”** & **“pursue ...1.5°C”** commitment at **face value**
  - To be based on **science** AND **equity**
  - **Ignore** political and economic **sensibilities**
- ***This frames a far more challenging mitigation agenda than other analysis***
    - CCC Net Zero implies 4% p.a reductions
    - Paris Agreement **implies 14% p.a**

***“What total reductions does the Paris Agreement require the UK transport sector to deliver?”***

**Not:**

***“What can the UK transport sector deliver in terms of reducing emissions?”***







# The TO DO LIST

## *In keeping with pursuing 1.5°C (Paris Agreement)*

- global carbon budget for energy is ~650GtCO<sub>2</sub> to 2100 and beyond
- In 2018, global CO<sub>2</sub>emissions were ~36GtCO<sub>2</sub>
- = 18 years of current emissions\*
- The UK's fair Paris 2°C carbon budget for energy incl. aviation and shipping is ~3 to 3.8 GtCO<sub>2</sub> ...for 2020 to 2100 & beyond i.e. 9 years of current emissions
- **Apportioned to the car sector = 7 to 8 years of current emissions**

\*Tougher than CCC Net Zero: does not account for irreversible feedbacks, but also not for speculative negative emissions technologies)

## TO DO LIST

- Rapidly ramp up mitigation to **14% p.a.**
- Total reduction of around 80% by **2030** (cf. 1990)
- Fully decarbonise energy** by around **2035-40**



# The Government's response

- Heavy funding for new roads
- Extra airport capacity (at many airports, not just Heathrow)
- Ongoing freeze on fuel duty while rail fares increase
- Cuts in funding for buses
- Limited or no funding for public transport and active travel (especially outside main cities)
- A deregulated planning system which promotes car based green-field development



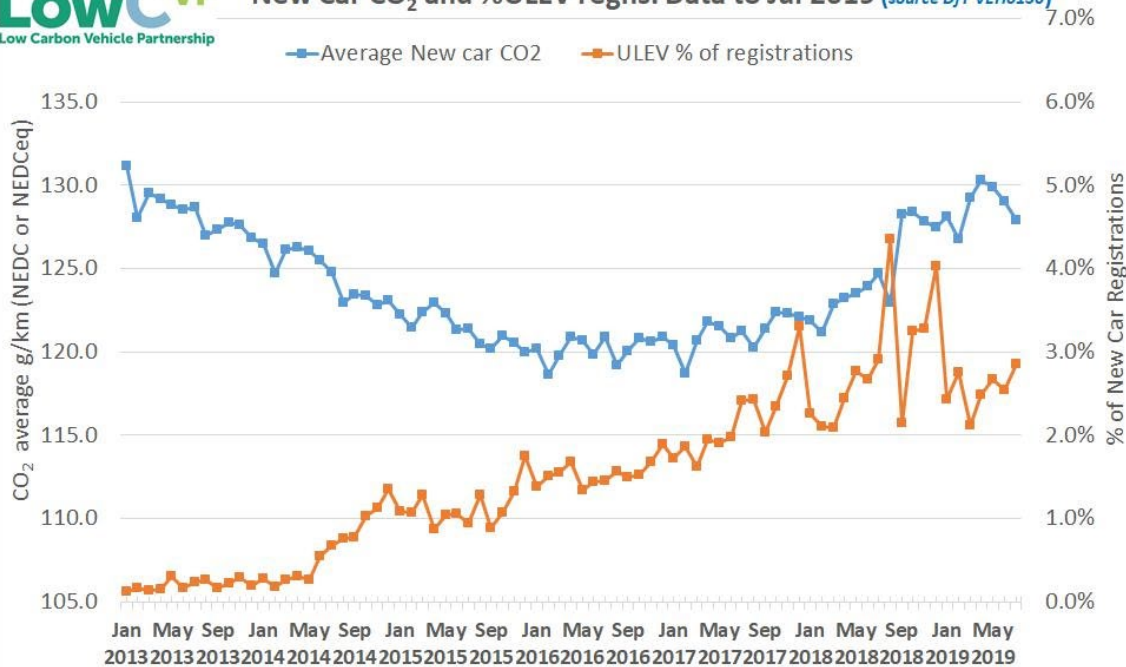


# Progress?

**LowCVP**  
Low Carbon Vehicle Partnership

New Car CO<sub>2</sub> and %ULEV regns. Data to Jul 2019 (source DfT VEH0150)

— Average New car CO<sub>2</sub> — ULEV % of registrations



- Latest DfT stats show new car CO<sub>2</sub> still at 129g/km (may be 125g/km in Dec 2019)
- This is along way from the 95g target for 2020/1
- ULEV sales have been quite flat but maybe signs of some increase from now ..





# And that is without considering the real-world performance gap

Year	Real world/Certification value CO2 shortfall
2005	12%
2009	19%
2011	21-25%
2012	22.5%
2013	30%
2014	38-44%
2015	41%



Adapted from Table 1.1 in Fontaras, N. et al. (2017) Fuel consumption and CO2 emissions from passenger cars in Europe Laboratory versus real-world emissions *Progress in Energy and Combustion Science*, 60: 97-131

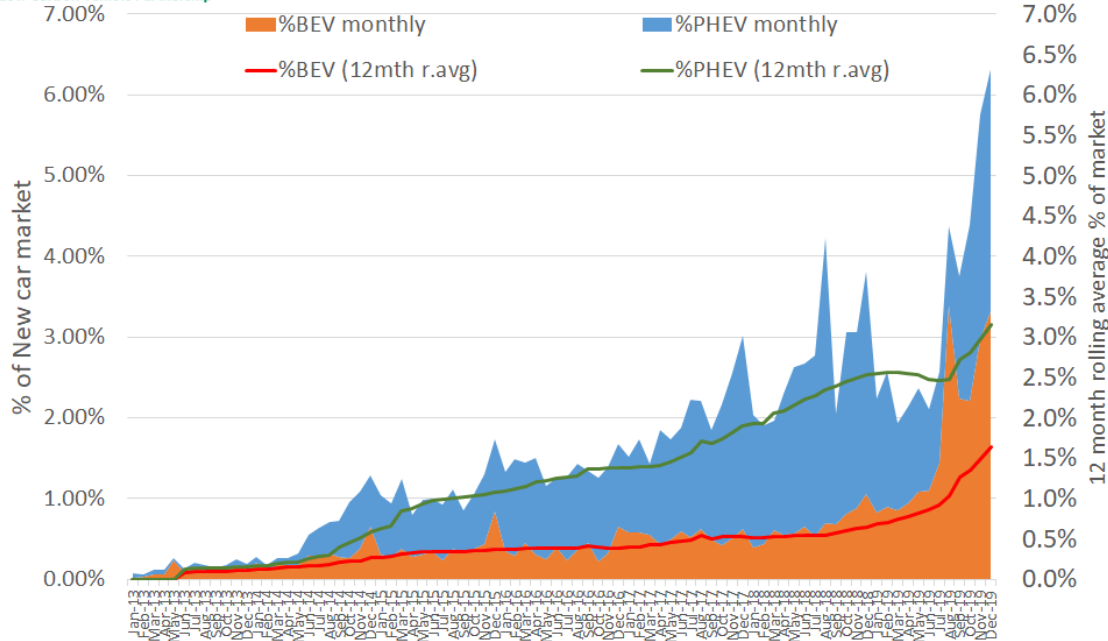




# Progress?

**LowCVP**  
Low Carbon Vehicle Partnership

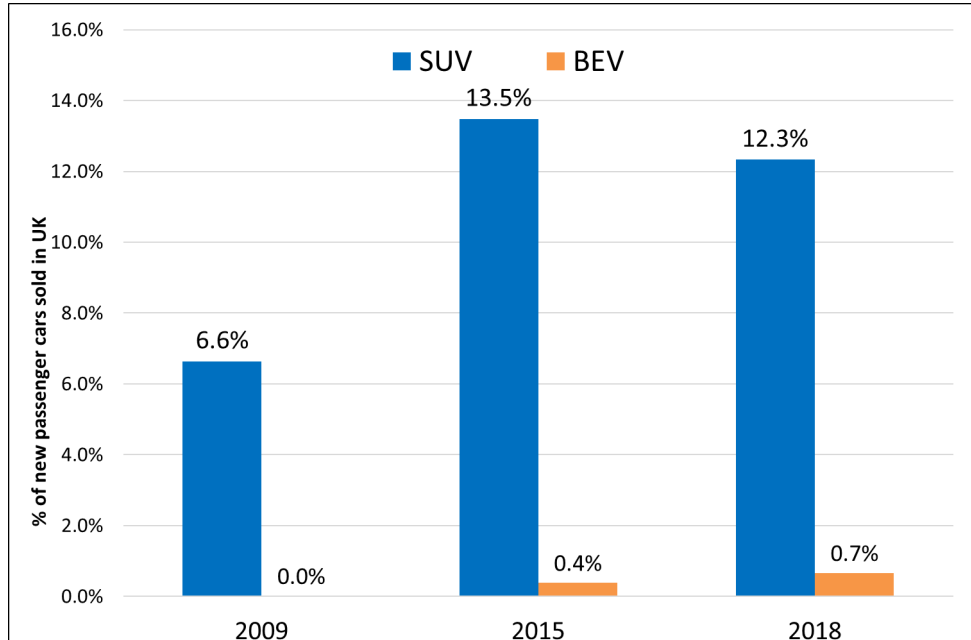
Plug-in car market share growth (SMMT data, LowCVP analysis)



- Sales of BEVs essentially flat until very recently



# SUVs outweigh BEV sales by 37:1



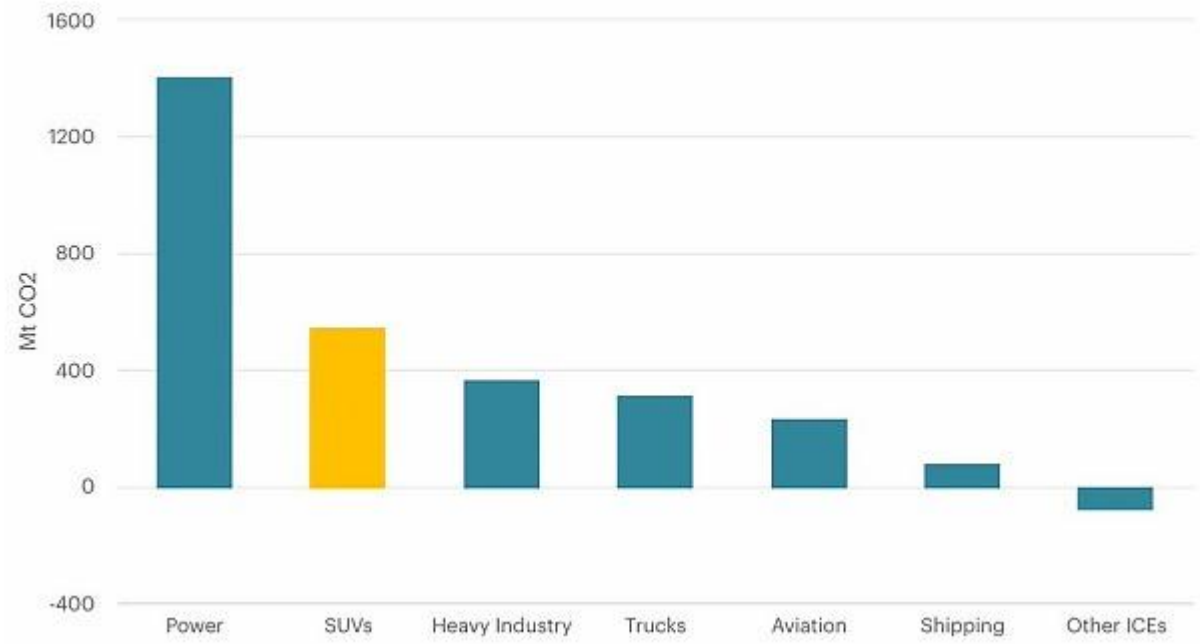
Source: Data derived from DfT vehicle statistics (Table VEH0253) and SMMT Motoring Industry facts (successive years)

- In 2018, SUVs accounted for 21.3% of new passenger car sales in the UK
- Just three years before it was 13.5%
- 3yr total sales of SUV:BEV = 37:1 (1.8m:47k)



# The threat of SUVs is global trend

**Change in CO2 emissions by energy sector, 2010-18**  
IEA Analysis



International Energy Agency

# And the majority of EVs (or at least PHEVs) are themselves SUVs ...

Top 20 generic models from July 2018 to June 2019

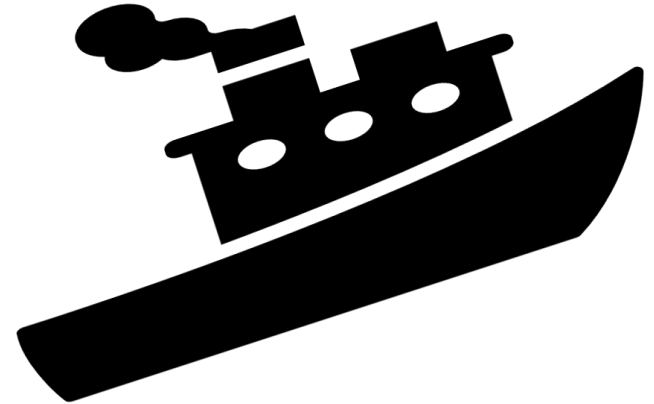
Generic model	PiG Eligible Cars <sup>2,3</sup>		Non PiG Eligible
	Category 1	Category 2/3	Plug-in Cars <sup>2,3</sup>
MITSUBISHI OUTLANDER	0	2,517	6,056
BMW 5 SERIES	0	1,670	4,877
BMW I3	4,242	0	0
NISSAN LEAF	4,114	0	0
LAND ROVER RANGE ROVER	0	0	3,959
MINI COUNTRYMAN	0	757	2,761
VOLKSWAGEN GOLF	2,007	1,216	6
RENAULT ZOE	2,668	0	0
JAGUAR I-PACE	2,643	0	0
BMW 2 SERIES	0	681	1,448
LEVC TX	0	0	0
KIA NIRO	439	242	1,020
BMW 3 SERIES	0	1,629	2
TESLA MODEL S	1,623	0	0
TESLA MODEL X	1,429	0	0
HYUNDAI IONIQ	484	250	568
NISSAN E-NV200	140	0	0
VOLVO XC90	0	267	890
VOLVO XC60	0	257	774
HYUNDAI KONA	692	0	0

- Up until March 2019, 2 out of 3 EVs sold were PHEVs (but has evened out since then)
- What proportion of mileage is undertaken in electric mode??
- All major manufacturers about to come out with an electric SUV



# SUVs are 4 X more polluting than a medium sized BEV

- The SUVs purchased in the past three years will be driving around for the next 10-15 years.
- = 8.2m extra tonnes of CO<sub>2</sub>
- = 12% of current annual emissions from cars in the UK



# A revolution?



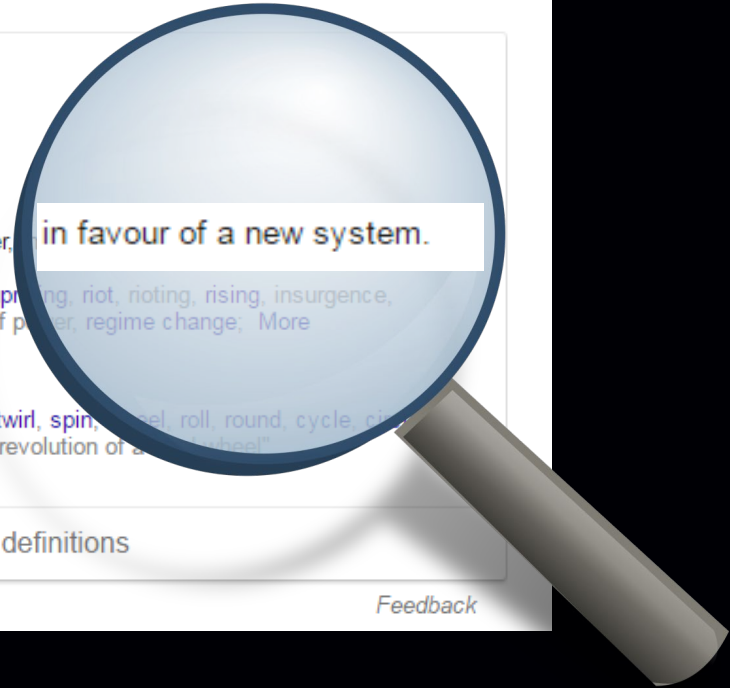
Showing results for *revolution* definition

## revolution

/rɛvəˈluːʃ(ə)n/

*noun*

1. a forcible overthrow of a government or social order, **in favour of a new system.**  
"the country has had a socialist revolution"  
*synonyms:* rebellion, revolt, insurrection, mutiny, uprising, riot, rioting, rising, insurgence, insurgency, coup, overthrow, seizure of power, regime change; More
2. an instance of revolving.  
"one revolution a second"  
*synonyms:* single turn, turn, rotation, circle, whirl, twirl, spin, wheel, roll, round, cycle, circle  
"the prop shaft turns 4.7 times for one revolution of a wheel"



Translations, word origin, and more definitions


[Feedback](#)

# Manifesto for Transport Studies Research in a Climate Emergency


## 1. Tell the Truth

2. Call out what should NOT be done
3. Focus on the RIGHT policies
4. Challenge the dominant framing
5. Think BIG

### E.g.:

 **Travel behaviour change is deliberately non-transformative**  
*“This change could be as simple as making just one journey per week by bike, or bus or walking short journeys instead of using the car.” (Darlington)*

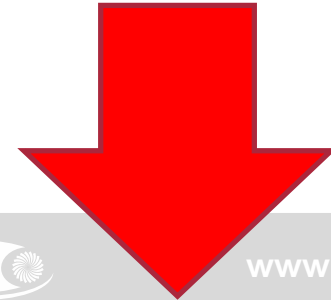
### E.g.:

 **There are no more win-win solutions**

# Manifesto for Transport Studies Research in a Climate Emergency

1. Tell the Truth
2. Call out what should NOT be done
3. Focus on the RIGHT policies
4. Challenge the dominant framing
5. Think BIG
6. Get ACTIVE

**What does 14% per annum reduction over the next 10 years mean?**








## Call out what should NOT be done

- **Stop** promising change without changing anything at all
- **Stop** referring to 'a revolution' with respect to new vehicle technology
- **Stop** building new roads and expanding airport capacity
- **Stop** advocating the building of new roads and airport capacity using junk models and data
- **Stop** burying head in the sand over the location of new development



# Manifesto for Transport Studies Research in a Climate Emergency

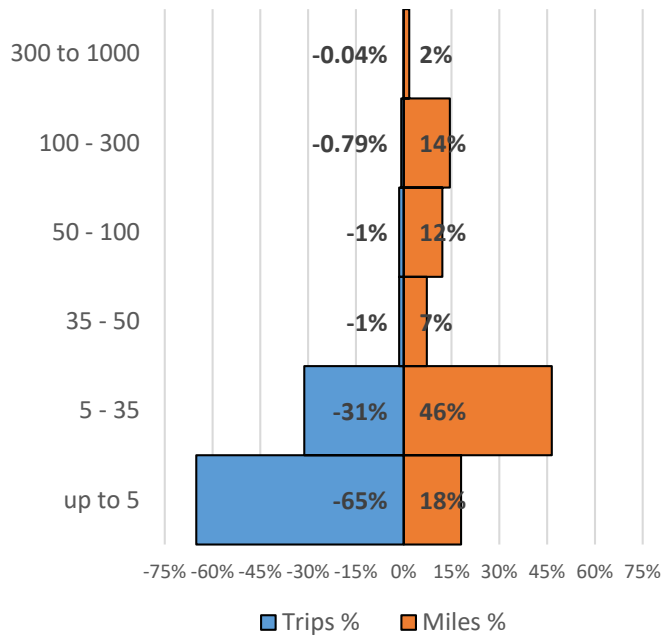
1. Tell the Truth
2. Call out what should NOT be done
3. Focus on the RIGHT policies
4. Challenge the dominant framing
5. Think BIG

-  Leisure travel
-  Interurban/ long distance
-  Car occupancy
-  Place-based
-  Rapid change



# Distribution of trips and miles by journey length

~ 3% trips do ~30% of total mileage  
(2017, England)



Long Distance Trips (LDT) = >50 miles

## Annual per capita mobility in England

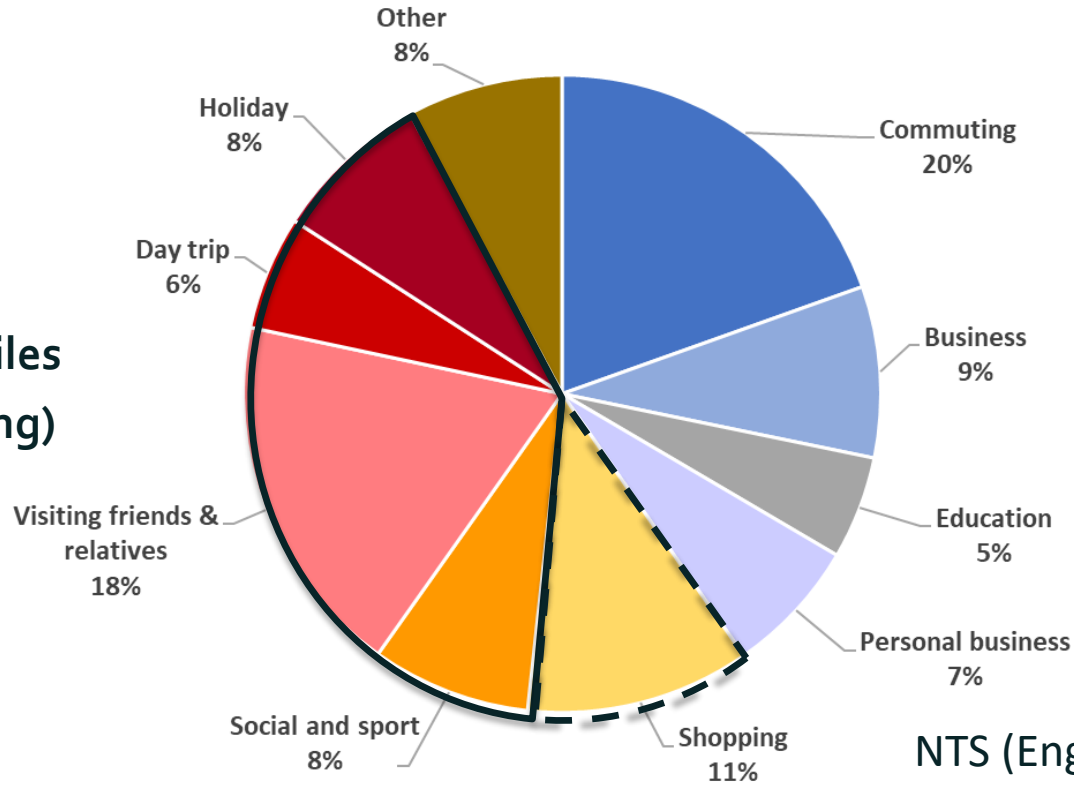
	Overall	LDT	% LDT
Miles	6,600	1,900	~30%
Trips	780	19	~3%

Source: NTS 2015 - 2017, pooled weighted N=46,603



# Proportion of miles undertaken by each journey purpose\*

Leisure travel = 40% miles  
(or 50+% if incl. shopping)

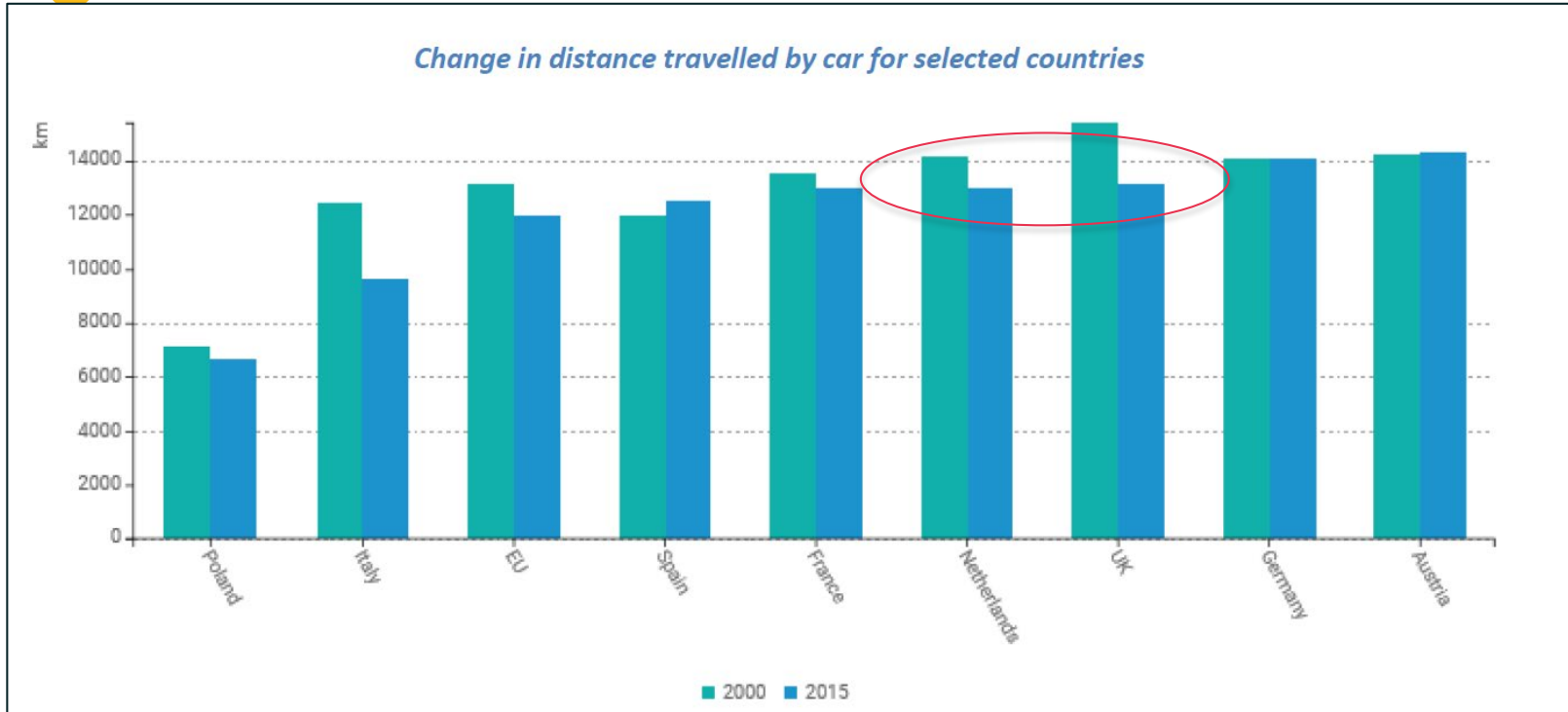


NTS (England) 2018  
\*surface modes only





# Leisure travel determines per

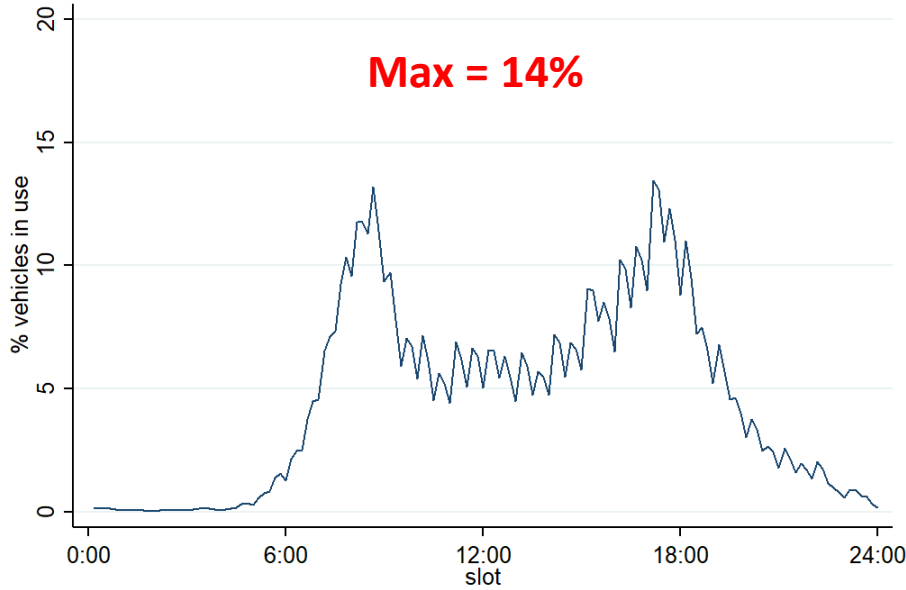




# Is this smart transport?

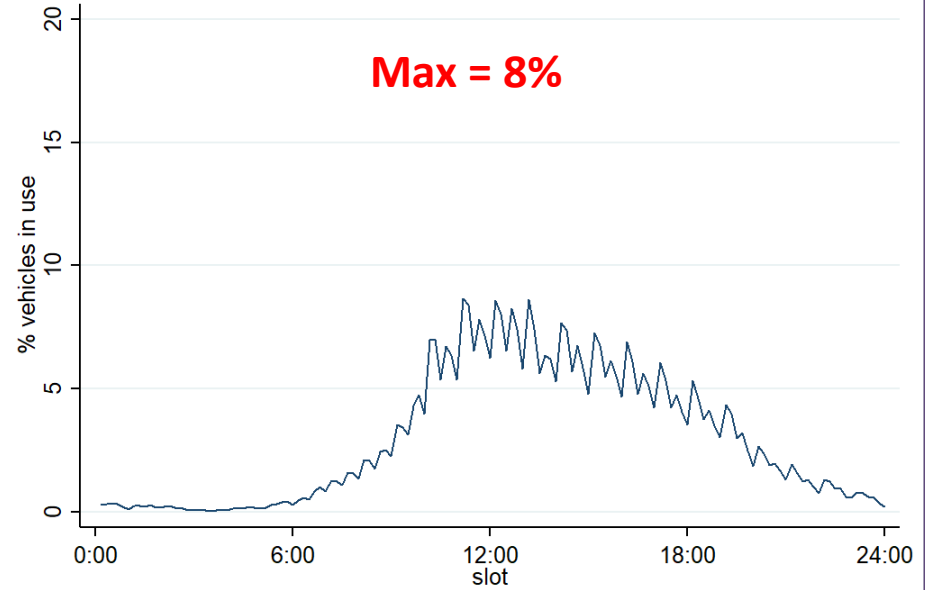
Tuesday

**Max = 14%**

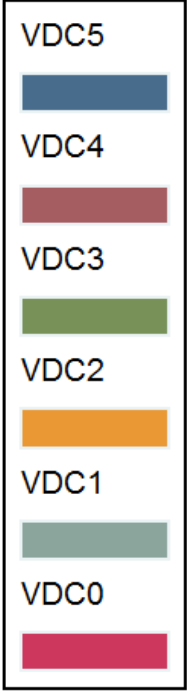
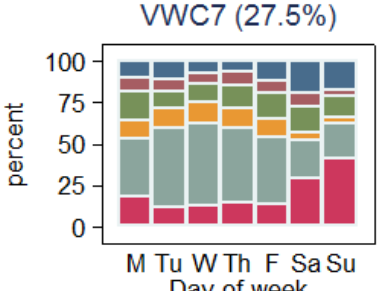
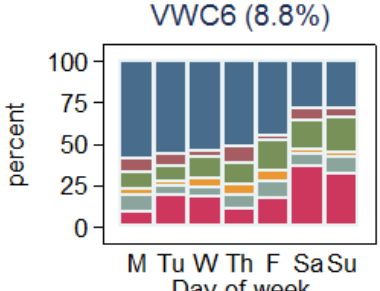
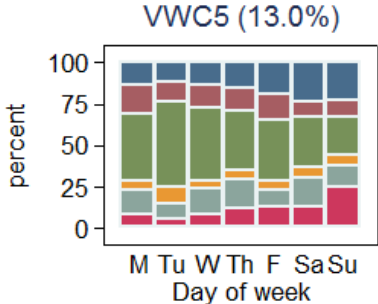
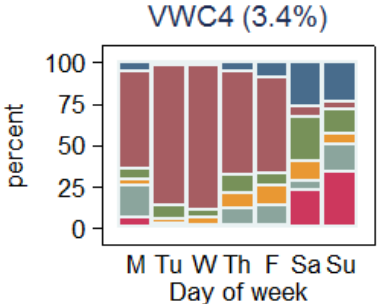
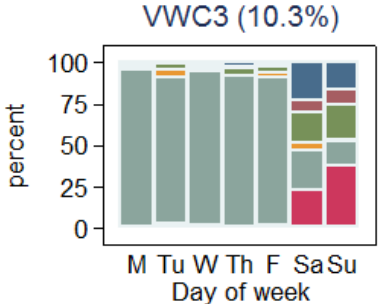
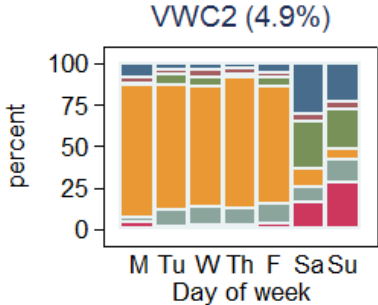
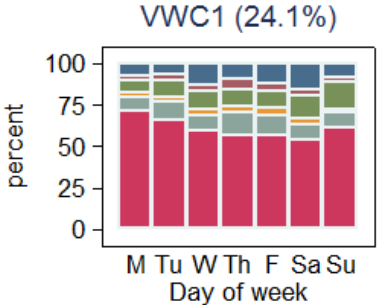
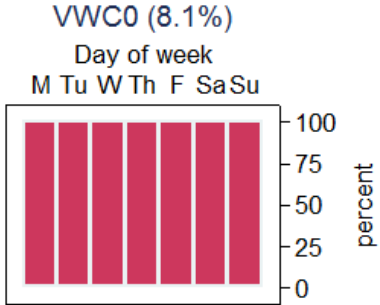


Sunday

**Max = 8%**



# Vehicle Week Clusters (VWCs)



Mattioli, G., **Anable, J.** and Goodwin, P. (2019) A week in the life of a car: a nuanced view of possible EV charging regimes. [European Council for an Energy Efficient Economy \(ECEEE\) Summer Study 2019 Proceedings](#): 1105-1116. Hyères France, 02 Jun 2019 - 08 Jun 2019.



# Is this smart transport?

**36 million**

empty seats during the morning commute

1.2 occupied seats per car



**62%**

of all car trips have a lone driver

1.55 occupied seats per car



## Shared mobility: where now? where next?

Commission On Travel Demand Shared Mobility inquiry: evidence graphics and recommendations

As the largest carbon emitting sector and one which has yet to show any clear emissions reduction trajectory, transport is at the heart of the climate emergency and centre stage in the shift to a net-zero carbon economy.

The Commission on Travel Demand Shared Mobility Inquiry focused on the potential to increase the occupancy of vehicles in-use, reduce individual ownership of assets and enhance multi-modal travel. The inquiry takes the position that more rapid and radical action is required to decarbonise the transport sector. This document gives an insight into the evidence with graphics and outline recommendations.



Download the full report at:  
[www.creds.ac.uk/where-now-where-next](http://www.creds.ac.uk/where-now-where-next)

[www.creds.ac.uk/where-now-where-next](http://www.creds.ac.uk/where-now-where-next)



TRANSPORT & MOBILITY







[www.creds.ac.uk](http://www.creds.ac.uk)





# Sharing must be centre stage

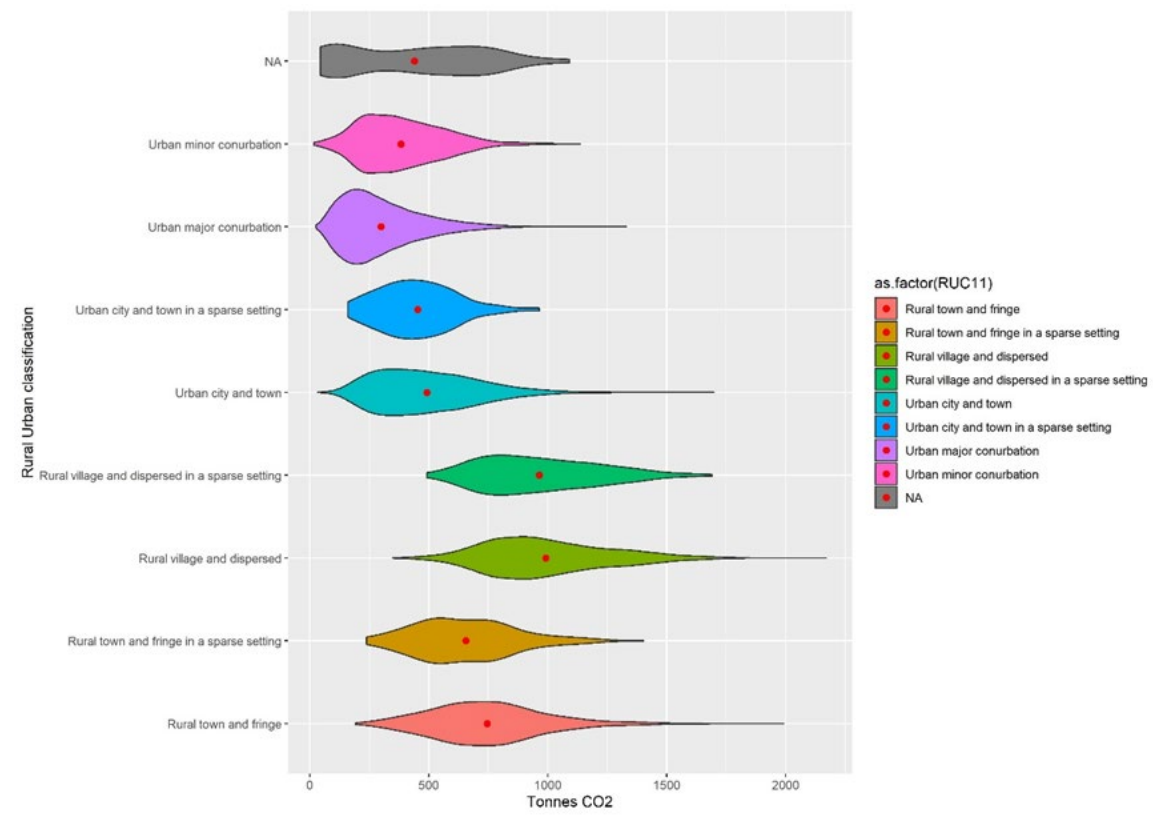
Traffic growth 2015–2050 <b>55%</b> Private travel	Average occupancy 2015 <b>1.5</b> 	Average occupancy 2050 <b>1.3</b> 
Traffic growth 2015–2050 <b>5%</b> Ride-sharing	Average occupancy 2015 <b>1.5</b> 	Average occupancy 2050 <b>1.7</b> 

Car  
Occupancy  
in Sweden is  
**1.73**





# Potential savings per LSOA from e-bikes are greatest in rural areas



Forthcoming paper on the potential carbon savings from e-bikes from Ian Philips and Jillian Anable (ITS Leeds)

# Manifesto for Transport Studies Research in a Climate Emergency

1. Tell the Truth
2. Call out what should NOT be done
3. Focus on the RIGHT policies
- 4. Challenge the dominant framing**
5. Think BIG

*“It is clear we cannot protect the living planet, our sense of place and belonging on it, and our own well-being, unless we change the frame through which we see it and through which we see ourselves.”*

Monbiot, G. (2019), p120

# Manifesto for Transport Studies Research in a Climate Emergency

1. Tell the Truth
2. Call out what should NOT be done
3. Focus on the RIGHT policies
4. Challenge the dominant framing
- 5. Think BIG**

*“...we claim to embrace systems thinking as a fundamental methodology, but then stop doing so when it comes to core economic categories, such as value, prices, or profits where we either adopt neoclassical reasoning or give up on economics altogether.”*

*Pirgmaier and Steinberger (2019)*



# The END

