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What Prompts People to Start Cycling: The Research Evidence

Date 25/09/18

UWE Bristol | University of the West of England

Centre for Transport & Society

Motivation

- Amount of cycling remains low in the UK and many other EU countries
- Despite much talk and some investment
- Lack of evidence on what increases cycling prevents effective strategies/measures

Purpose of presentation

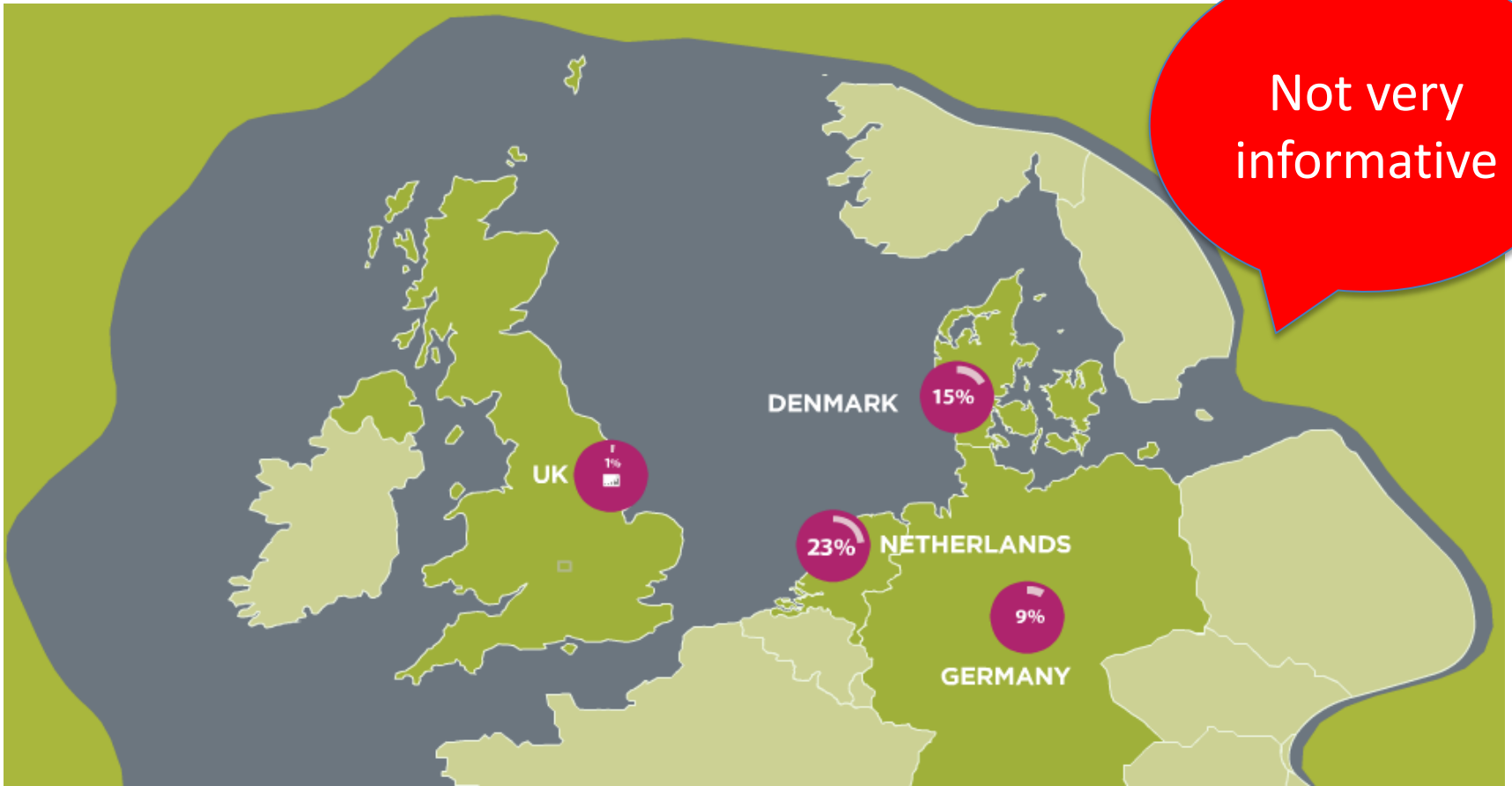
To understand the circumstances in which people start/stop or increase/decrease cycling

Presentation structure

1. Type of evidence needed
2. Review of evidence
3. Conclusions

1. Type of Evidence Needed

Cross-sectional comparisons



Need for longitudinal studies

With respect to factors that influence cycling Heinen et al (2010) stated:

"…conducting longitudinal research would allow one to detect the most important factors at the level of the individual."

Longitudinal studies can help answer questions such as…

Who changed their cycling behaviour?

How did they change it?

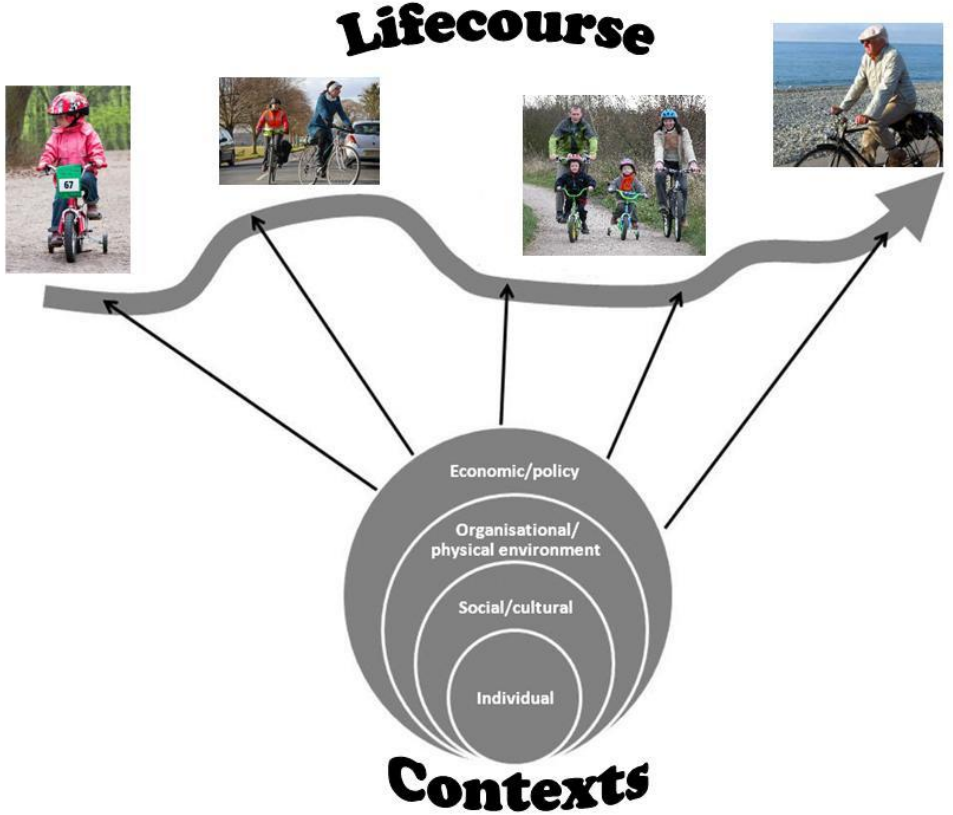
Why did they change it?

Did they maintain the change?

2. Review of Evidence

Structure of review

- Day-to-day cycling
- Year-to-year cycling
- Life events
- Interventions



Day-to-day cycling

- One half of commuter cyclists do not cycle to work every day (Heinen et al., 2011; Bartle et al., 2016; Ahmed et al., 2017)
- Decision to cycle influenced by schedules, weather and temporary events (Heinen et al., 2011; Bartle et al., 2016; Ahmed et al., 2017)

"Travel largely dictated by weather Monday to Wednesday as will cycle if ok, will drive alone if extremely wet, or if I am ill e.g. have a cold. Thursday to Friday I always drive as I take my child to nursery on these days" [Bristol cycle commuter, July 2015. Source: Bartle et al., 2016]

Year-to-year cycling

- Car drivers more likely to persist in driving to work one year later than cyclists in cycling to work (Clark et al., 2016)

Commuting mode one year later

	% of people switching to commute mode by year t+1							
Commute mode in year t	Car	Walk	WFH	Bus	Train	Cycle	Metro	Other
Car	**91.4%**	2.5%	2.1%	1.1%	1.0%	0.6%	0.3%	1.0%
Walk	13.3%	76.1%	1.5%	4.6%	1.3%	1.6%	0.5%	1.0%
WFH	26.5%	3.5%	62.4%	0.8%	3.0%	0.6%	1.0%	2.3%
Bus	16.6%	8.4%	1.1%	65.8%	2.7%	1.7%	2.5%	1.4%
Train	9.3%	2.9%	2.7%	5.7%	70.7%	1.0%	6.6%	1.0%
Cycle	16.3%	9.0%	0.8%	1.7%	1.9%	**67.4%**	1.0%	1.9%
Metro	6.8%	2.0%	2.4%	8.3%	13.1%	1.5%	64.3%	1.5%
Other	29.4%	10.6%	4.1%	2.4%	4.5%	3.3%	2.9%	42.9%

Source: Understanding Society (15,200 workers in England)

Year-to-year cycling

- Car drivers more likely to persist in driving to work one year later than cyclists in cycling to work (Clark et al., 2016)
- Public transport users and walkers more likely to switch to cycling to work than car drivers (Clark et al., 2016)

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Walk	13.3%	76.1%	1.5%	4.6%	1.3%	**1.6%**	0.5%	1.0%
WFH	26.5%	3.5%	62.4%	0.8%	3.0%	0.6%	1.0%	2.3%
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Year-to-year cycling

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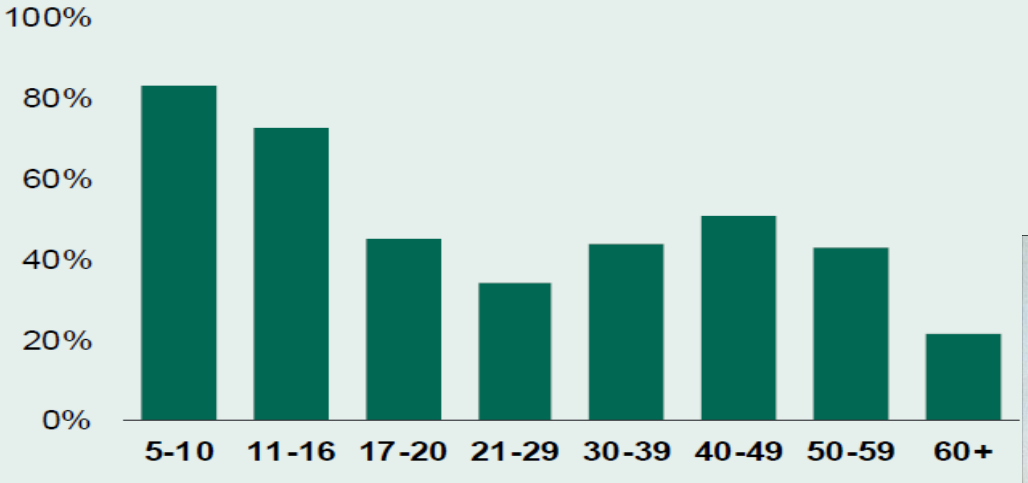
- Public transport users and walkers more likely to switch to cycling to work than car drivers (Clark et al., 2016)
- Shift towards more cycling is more likely for those already partly cycling ('multimodals') (Kroesen, 2014; de Haas et al., 2018)
- Cycling for work and non-work are positively reciprocating (Kroesen and Handy, 2014)

Access to a bicycle [NTS0608]

Proportion who own or have use of a bicycle, by age band: 2013-15 combined



Stages of life

Life events (1)

School and college

- Positive attitudes towards cycling decrease as children move through schools (Underwood et al, 2014)
- Going to college linked to increase in cycling (Rau and Manton, 2016)

Driving licence

- Acquiring a driving licence associated with decrease in cycling frequency (Scheiner and Holz-Rau, 2013)

Life events (2)

Employment

Changes in employment (status/workplace) associated both with starting/stopping cycling (Chatterjee et al., 2013; Oakil, 2013; Busch-Geertsema and Lanzendorf, 2017)

Moving home

Changes to access to facilities associated with utility cycling and to physical layout with leisure cycling (Beenackers et al., 2012)

Mobility culture of new and old location matter (Smart, 2010; Klinger and Lanzendorf, 2016)

Life events (3)

Social relationships

Partners, friends and colleagues encourage returns to cycling (Bonham and Wilson, 2012; Sherwin et al., 2014)

Children

Birth of a child associated with decreased cycling (Scheiner and Holz-Rau, 2013) but the opposite effect found for some parents (Lanzendorf, 2010)

Life events (4)

Health

Heath concerns encourage cycling in mid-to-later life (Bonham and Wilson, 2012) but health difficulties prevent continued cycling although individuals adapt to continue (Jones et al., 2016)

Retirement

Retirement associated with increase in cycling (Scheiner and Holz-Rau, 2013)

Interventions – summary of evidence

Type	Summary of evidence
Training	Increases cycling confidence and frequency (adults and children)
Trials/Events	Leads to sustained take up of cycling but participation rates can be low
Destination-based (e.g. workplace)	Increases cycling mode share if conditions are supportive. Long-term effects unknown.
Bike hire	Most users switch from using own bikes, walking or public transport.
Physical infrastructure	Extent of new cyclists not shown to be large. Those in closer proximity increase cycling more.
City-wide multiple measures	Increases in cycling in some cases which can grow in longer term

Ride to Work Day in Victoria (Australia)

- 5577 people registered in 2005
- 1 in 4 of first timers (cycling to work) still rode 5 months later
- 57% of first timers said event had influenced decision to cycle to work
- Women more likely to be first timers and continue cycling to work
- First timers cycled to work less frequently than established riders

Source: Follow-up survey results reported in Rose and Marfurt (2007)

Cambridgeshire Guided Busway (Eng.)

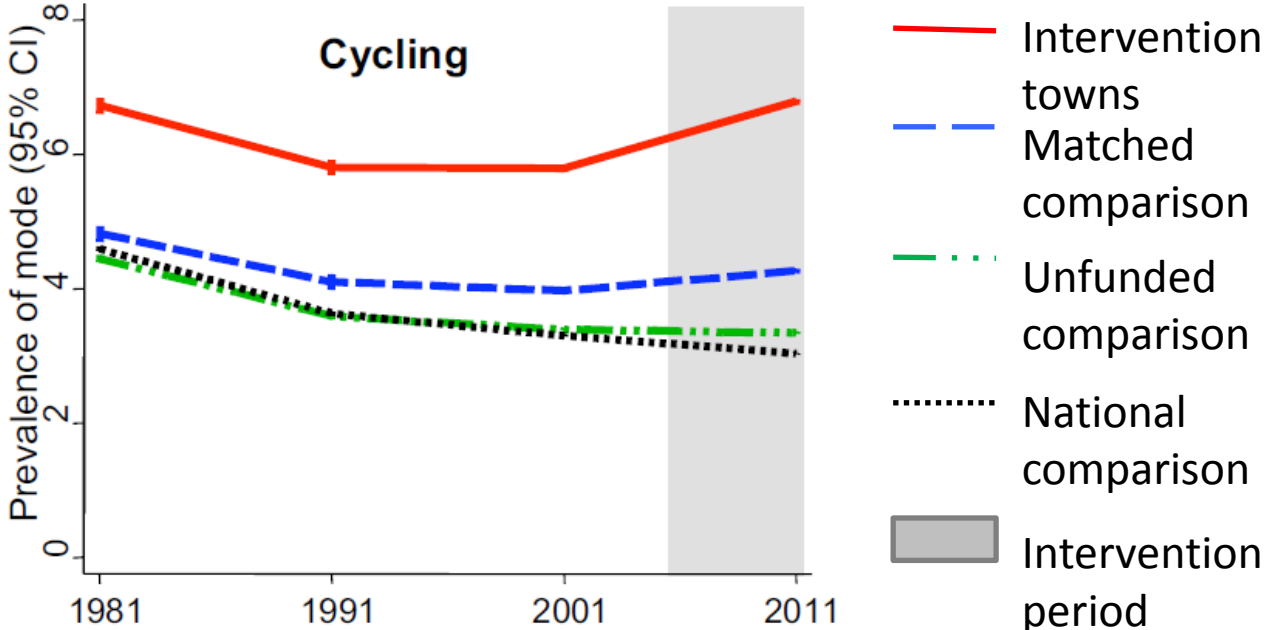
- New busway in 2011 included a traffic free walking and cycling route
- Those living close to the busway more likely to
  - Use the busway for cycling
  - Increase cycle commuting (by 34% if lived within 4kms instead of 9kms)
- Those who increased cycling had a mean increase of 80 minutes per week, implying they were new cycle commuters

Source: Panel survey results reported in Panter et al. (2015)

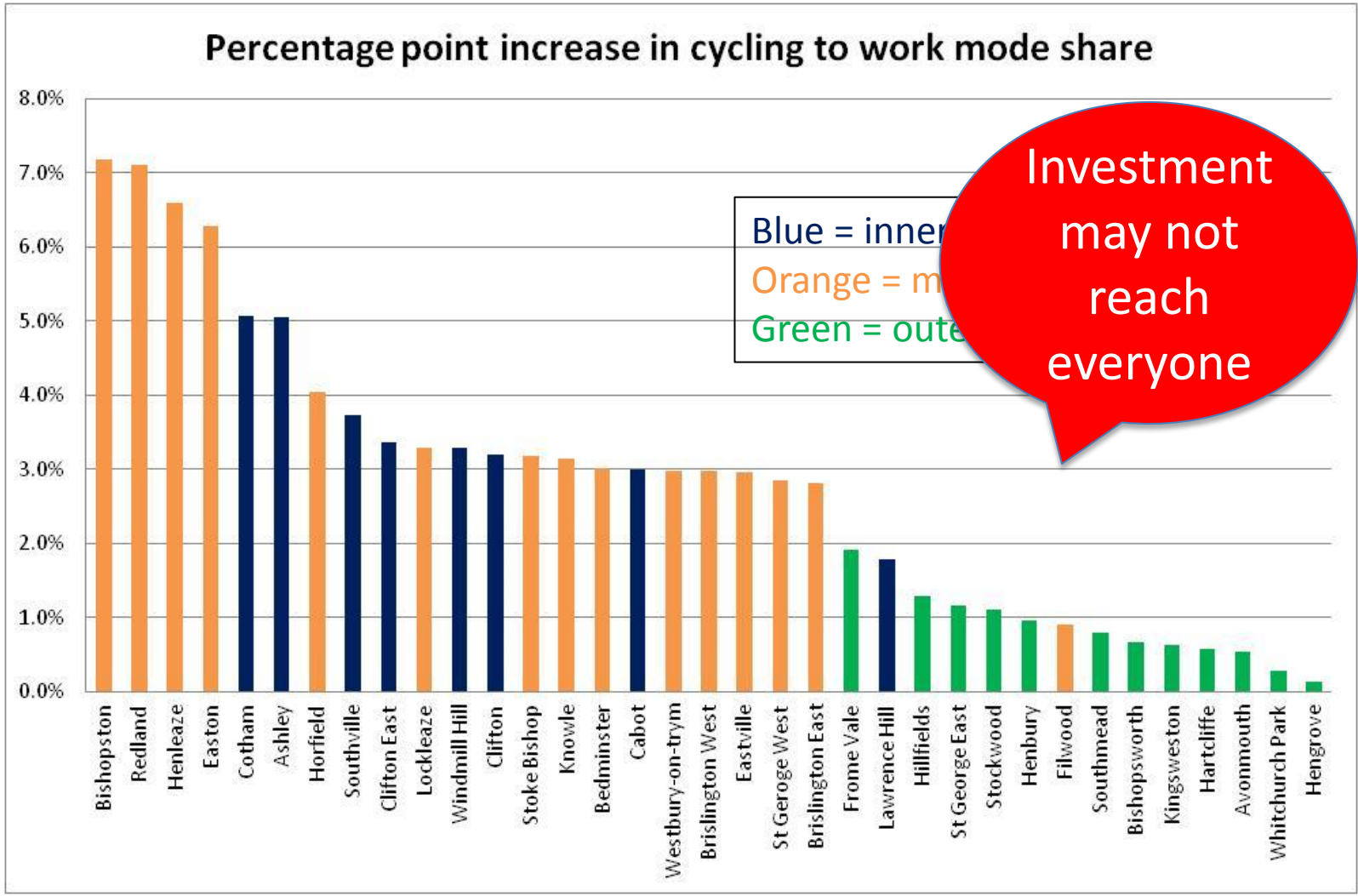
Cycling Cities and Towns (Eng.)

- Mixtures of capital investment (e.g. cycle lanes) and revenue investment (e.g. cycle training) (2005-11)
- Prevalence of cycling to work rose from 5.8% in 2001 to 6.8% in 2011

Source: Census data analysis by Goodman et al. (2013)



Bristol



Source: Census data analysis by Chatterjee

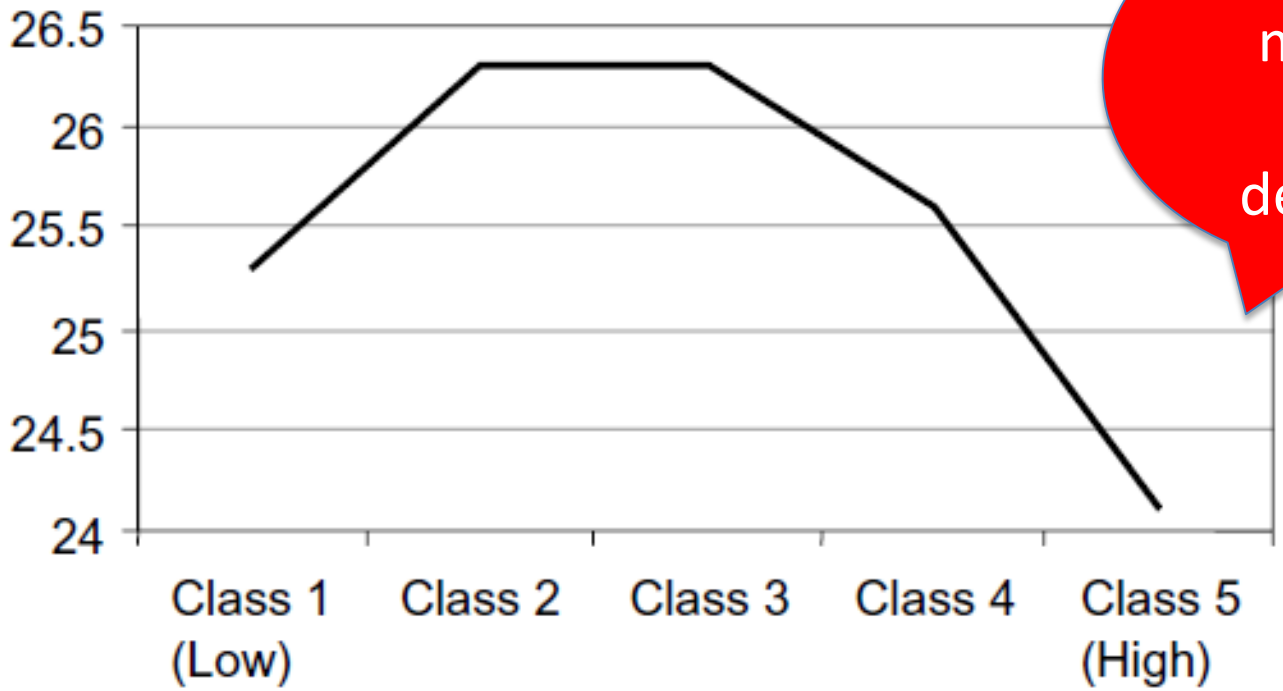
3. Conclusions

What prompts people to start cycling?

- Evidence that interventions increase cyclists/cycling, although reach is often limited and longevity uncertain
- Evaluation limitations make it difficult to assess long-term impact of specific interventions
- Long-term, city-wide investment is key (with priority for cycling over other transport modes)
- Life events increase likelihood of behavioural change – target people at life change moments

Thanks for you attention

Cross-sectional analysis



Cannot modify pop. density?

Proportion of bicycle trips per person per day (y-axis) versus population density (x-axis) for Netherlands (source: Rietveld and Daniel (2004))

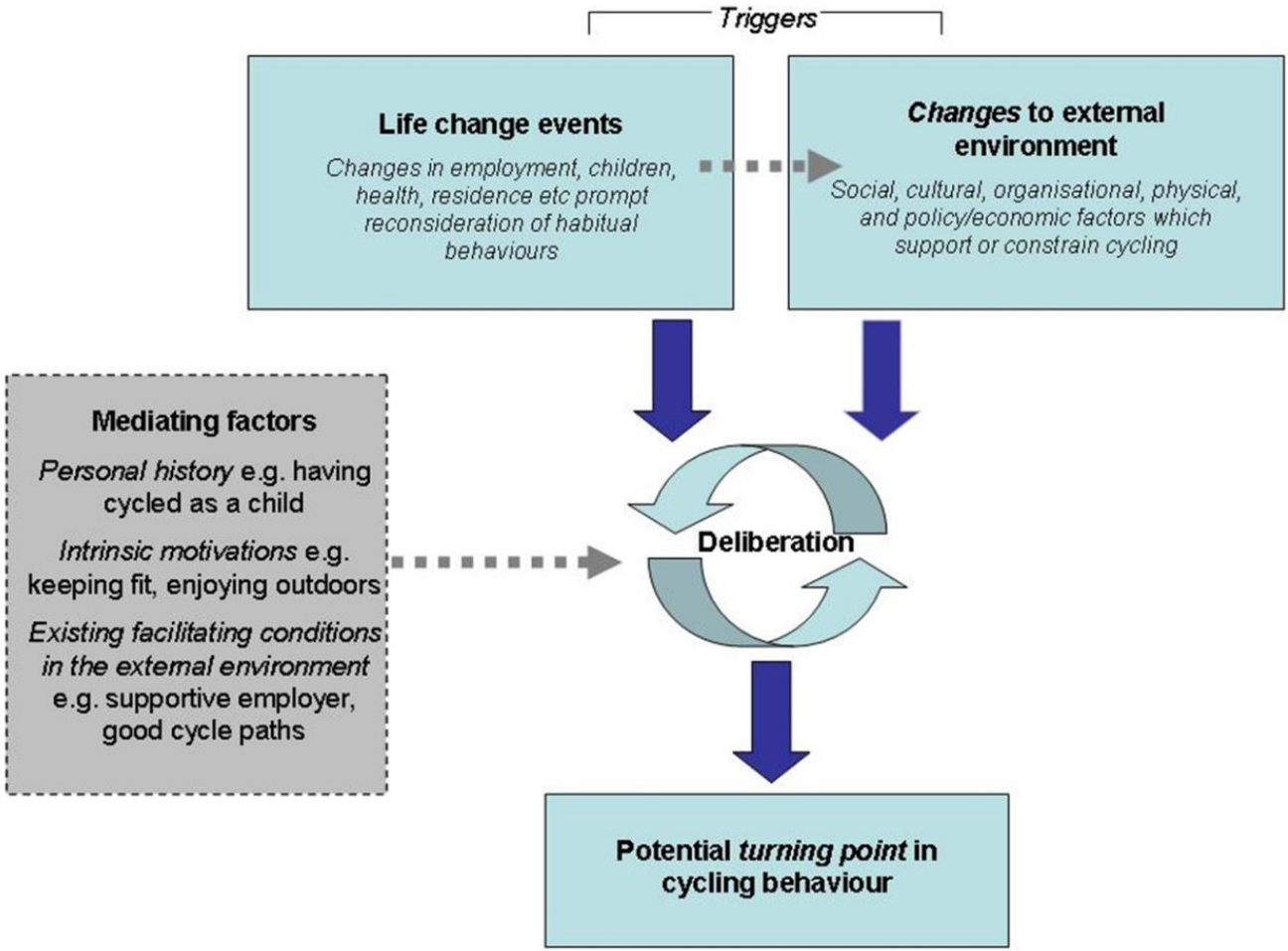
Types of longitudinal studies

Type of study	Contribution
Time-series observations	Aggregate change in activity over time
Repeated cross-sectional survey	Aggregate change in attitudes & behaviour over time
Retrospective cross-sectional survey	Self-reported behavioural histories
Life history interviews	Interviewer-prompted behavioural histories
Panel study	Tracking at regular intervals of individual attitudes and behaviour for population representative sample
Cohort study	Tracking at regular intervals of individual attitudes and behaviour for a particular group

Scope of review

- Longitudinal studies (of change over time)
- Studies explicitly considering cycling behaviour
- Academic literature across disciplines
- Systematic reviews and own collections of literature

Combination of life events and interventions



Source: Chatterjee et al. (2013)

Die große Perspektive:

Was es für die Verdoppelung des Radverkehrs braucht.

1. Radfahrkompetente Kinder

mobilitäts
agentur
wien

mobilitäts agentur wien

EXPERTEN SCHLAGEN ALARM

Kleine Zeitung

In Graz verlernen die Kinder das Radfahren

40 Prozent der Volksschüler haben zuletzt die Radfahrprüfung nicht geschafft. Kann man den Lenker herumreißen?

Von **Michael Saria** | 11.53 Uhr, 23. September 2018

Radfahren in den Schulunterricht integrieren

mobilitäts agentur wien

Dreifachnutzen: Klimaschutz, gesunde Kinder, mehr Sicherheit

mobilitäts agentur wien

- In Lehrpläne der Primar- und Sekundarstufe aufnehmen
- Fahrradabzeichen einführen
- Fahrradprüfung ist Teil des Unterrichts
- Kompetenzen bei PädagogInnen aufbauen

2. Radfahren selbstverständlich machen

mobilitäts agentur wien

Mobilitätsagentur Wien | Martin Blum

Starke Kampagnen wirken

mobilitäts agentur wien

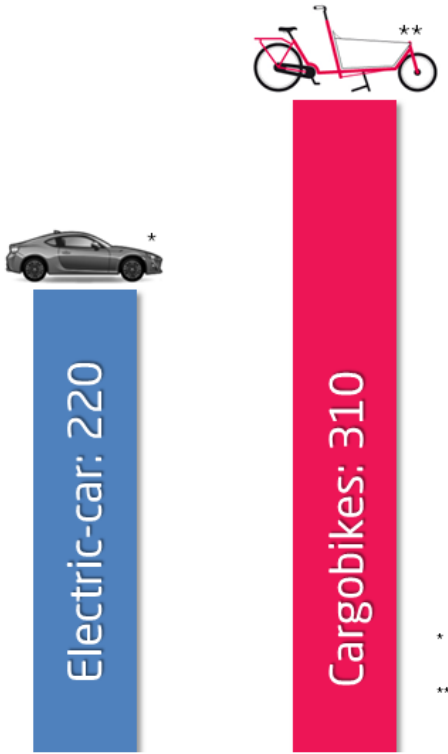
- Breite Bewusstseins-bildungskampagnen für Alltagsradfahren umsetzen
- Weiterbildungsprogramme für alle Entscheidungsträger-Ebenen zum Kompetenz-aufbau etablieren
- Politisches Commitment herstellen

3. Moderne Fahrräder für Österreich

mobilitäts agentur wien

2017: Mehr Transportfahrräder als E-Autos in Wien gefördert *

mobilitäts agentur wien



* bis die Fördersumme verbraucht war

* New registrations
max.4.000€ funding by government

** Funded by the city of Vienna
with max.1.000 €

2018: Mehr als die Hälfte der Neuwagen sind Firmenwagen

mobilitäts agentur wien

Mit einem vorsichtigen Berechnungsansatz kommt die OECD für Österreich auf einen Steuerentgang von jährlich rund 1.500 Euro pro Fahrzeug und fast 600 Millionen Euro insgesamt.

Quelle: www.vcoe.at

Kaufanreize für neue und sichere Fahrräder schaffen

mobilitäts agentur wien

- Förderaktionen für E-Bikes und Transportfahrräder einführen
- Den Kauf von Alltagsfahrrädern steuerlich absetzbar machen

4. Sichere und komfortable Radwege für Österreich

mobilitäts agentur wien

Mariahilfer Straße: Vorher

mobilitäts
agentur
wien

Mariahilfer Straße: Nachher

mobilitäts
agentur
wien

David und Goliath

„Diese Förderungen lösten insgesamt Investitionen von 210 Millionen Euro aus“

(Masterplan Radfahren, bmlfuw 2015, zu Investitionen in Radverkehrsinfrastruktur über den 8-jährigen Zeitraum 2007-2014)

“Die aktuelle Sechs-Jahres-Planung sieht bis 2023 insgesamt 7,8 Milliarden Euro für das hochrangige Straßennetz vor.“

(Asfinag, 13.2.2018)

5 Milliarden Euro für Radwege

mobilitäts agentur wien

- In einer nationalen Kraftanstrengung werden bis zum Jahr 2030 fünf Milliarden Euro in Radinfrastruktur investiert (zusätzlich).
- Baulandwidmungen ohne Radweganschluss sind nur mehr in Ausnahmefällen möglich.

Verkehrsregeln sind oft wenig radfreundlich

mobilitäts agentur wien

5. Vorrang für den Radverkehr

mobilitäts agentur wien

- Radverkehr in StVO und Richtlinien systematisch bevorzugen
- Rechts abbiegen bei Rot für Radfahrer erlauben
- Tempo 30 ist innerorts die Regel
- Nebeneinander Radfahren erlauben

Das Fünf-Punkte-Programm für mehr Radverkehr

mobilitäts agentur wien

1. Radfahrkompetente Kinder
2. Radfahren selbst-verständlich machen
3. Moderne Fahrräder für Österreich
4. Sichere & komfortable Radwege für Österreich
5. Vorrang für den Radverkehr

mobilitäts
agentur
wien

Mobilitätsagentur Wien GmbH | Martin Blum | martin.blum@mobilitaetsagentur.at

www.fahrradwien.at

Ein Fahrzeug für (fast) jede Lebenssituation

mobilitäts agentur wien





UNIVERSITY OF LEADING THE WAY WESTMINSTER

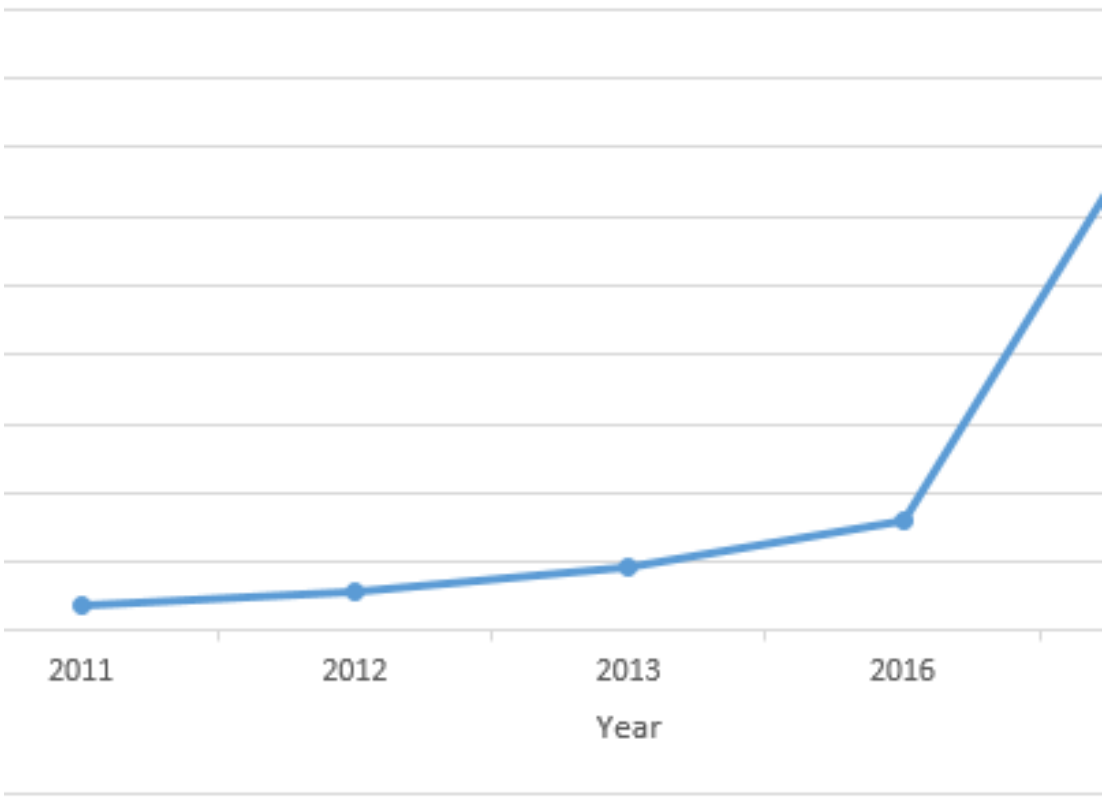
2018 EUROPÄISCHER RADGIPFEL
Salzburg // 24. - 26.09.2018

We Built It: Did They Come? Methods for Evaluating Interventions

Dr. Rachel Aldred
University of Westminster

Talk content

- A method for evaluating large scale interventions: natural experiments
- A method for evaluating small scale interventions: intercept studies with count data



The Causality Problem

- What caused the change?
- Would it have happened anyway?
- Was it really something we did? And if so, what?
- Would it work elsewhere?

Natural Experiments

A LONDON BOARD OF HEALTH HUNTING AFTER CASES LIKE CHOLERA

Home > Press Releases > Mayoral > **'Mini-Holland' revolution**

Suburbs transformed for cyclists in £100m 'mini-Holland' revolution

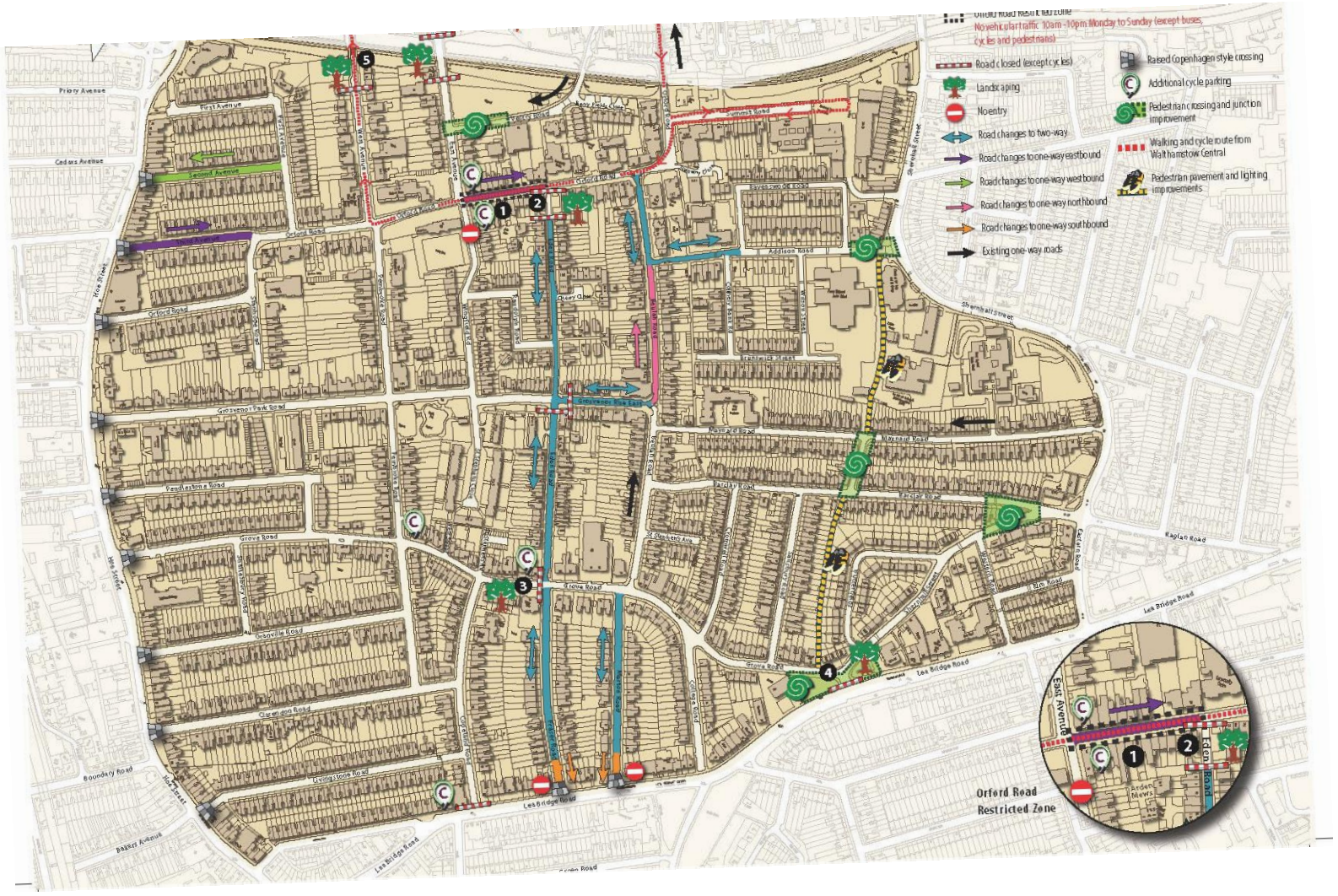
10 March 2014

All eight of the outer boroughs shortlisted for the "mini-Hollands" programme will win funding for substantial and transformative change, the Mayor Boris Johnson, announced today.

Three boroughs – Enfield, Kingston and Waltham Forest – have been selected for full mini- Holland status, receiving up to £30 million each for changes including:

Mini-Hollands: a perfect natural experiment?

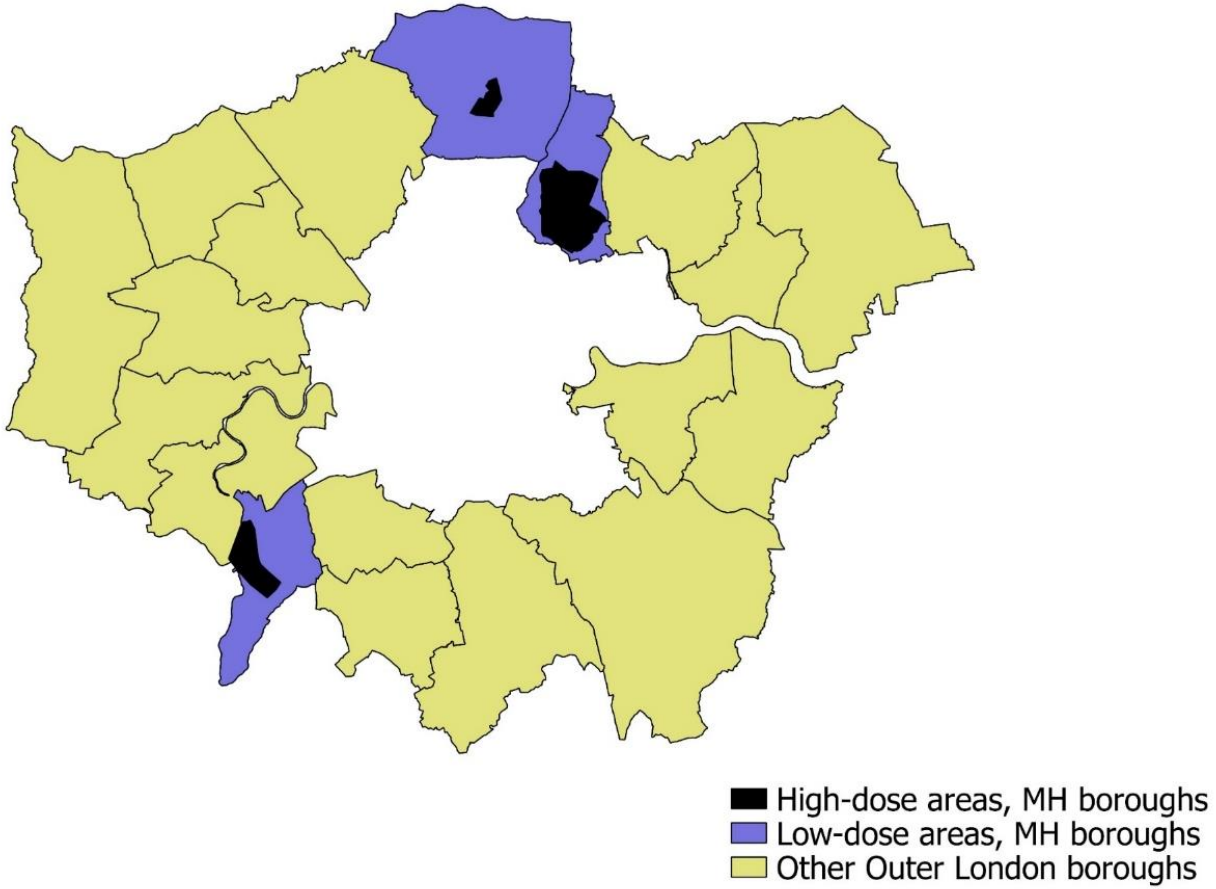
Pics: Joseph Croft (top), We Support Waltham Forest Mini-Holland (bottom)


Orford Road Restricted Zone
No vehicular traffic 10am - 10pm Monday to Sunday (except buses, cycles and pedestrians)
Road closed (except cycles)
Landscaping
No entry
Road changes to two-way
Road changes to one-way eastbound
Road changes to one-way westbound
Road changes to one-way northbound
Road changes to one-way southbound
Existing one-way roads
Raised Copenhagen style crossing
Additional cycle parking
Pedestrian crossing and junction improvement
Walking and cycle route from Walthamstow Central
Pedestrian pavement and lighting improvements
Orford Road Restricted Zone

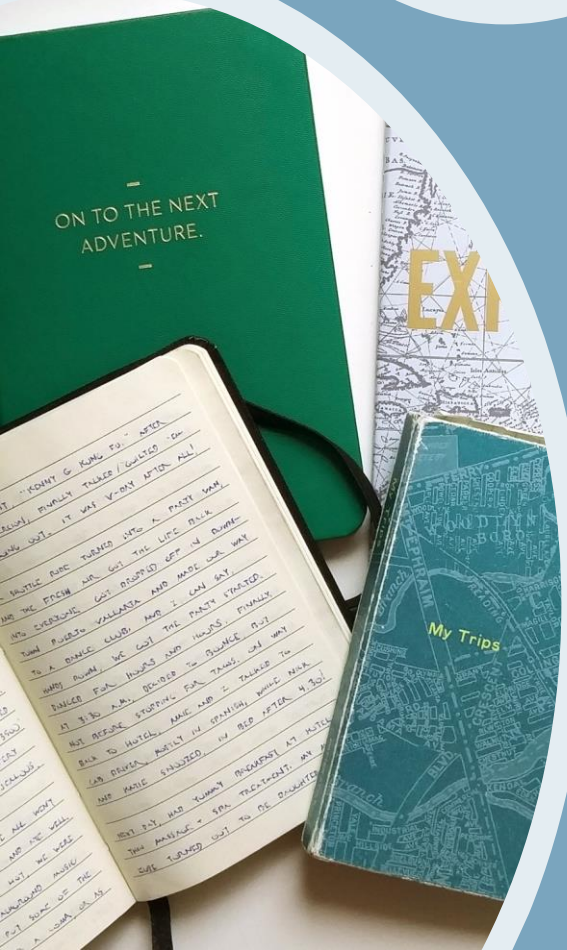
The People and Places Survey

Uses a ‘natural experiment’ approach to examine whether and how proximity to mini-Holland interventions is associated with changes in travel behaviour and attitudes, and change in attitudes to the local environment.

- 3435 (baseline)/1712 (Wave 1) participants across Outer London
- Led by Westminster University & funded by TfL
- Paper published in TRA co-authored with Anna Goodman & Joseph Croft
- Online longitudinal survey
  - Baseline May-June 2016
  - Wave 1 May-June 2017
  - Wave 2 just finished (May-June 2018)
  - Continues until 2019-2021 TBC



Low & high-dose areas (May 2017)



Survey Questions

Travel diary core in measuring behaviour change, but series of questions on related topics

Perceptions of local environment

- Cycling is unsafe because of the traffic
- My local area is safe for an 8-year-old child to cycle
- There are special lanes, routes or paths for cycling
- My local area is pleasant for cycling
- Walking is unsafe because of the traffic
- My local area is safe an 8-year-old child to walk alone
- My local area is pleasant for walking
- There are good quality pavements for walking
- There are enough safe places to cross roads
- My local area has enough places to stop and rest outdoors
- The area has enough shade or shelter from the weather
- There are places to walk to, such as shops, restaurants, leisure facilities
- The area is unsafe because of the level of crime or antisocial behaviour
- Air pollution caused by motor traffic is a problem in my area

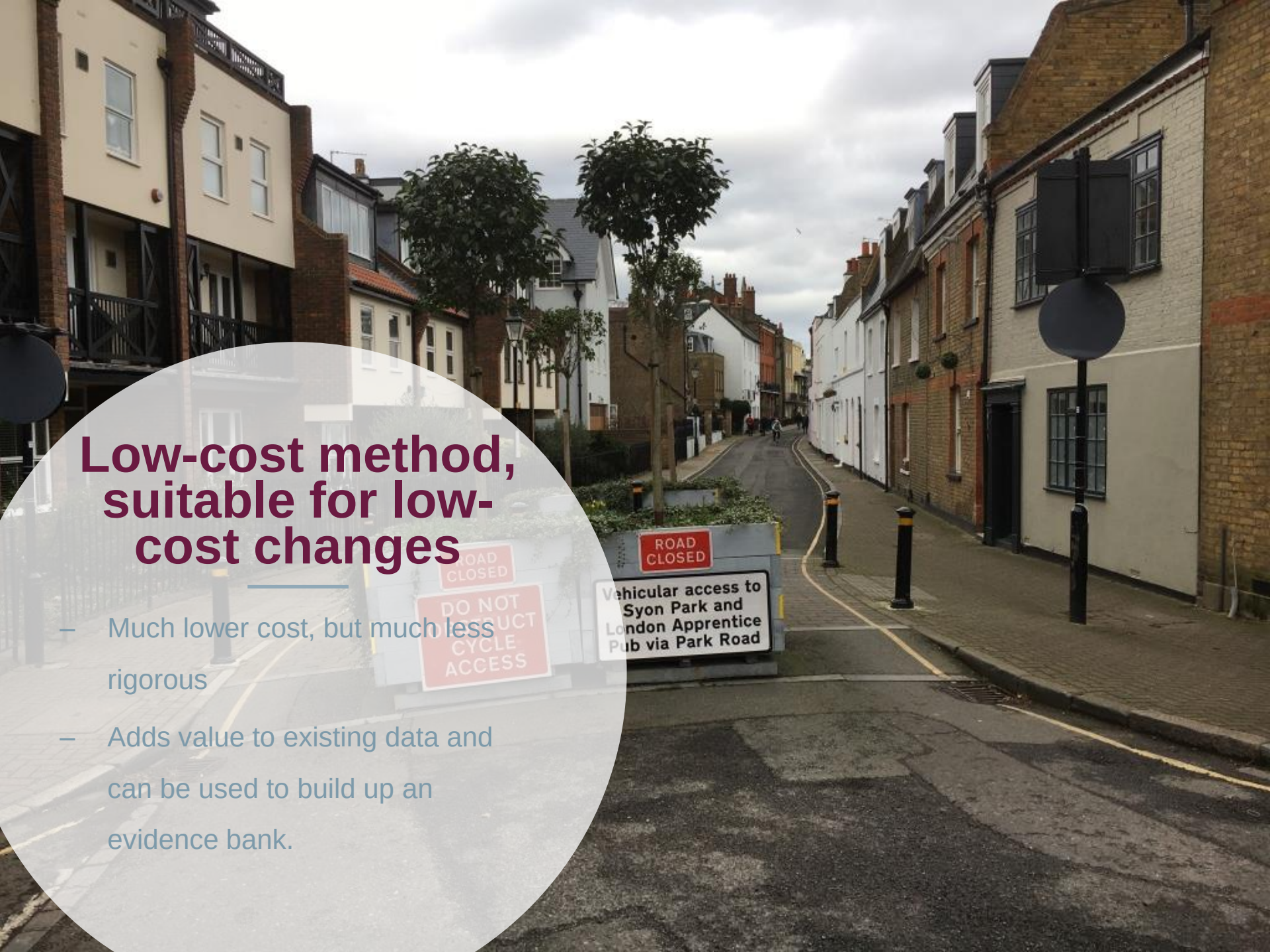
The Wave 1 results suggest consistent evidence of an increase in active travel in mini-Holland areas, particularly for 'high-dose' areas, relative to the control group.

This included evidence of more time spent in active travel (walking + cycling) and increased participation in cycling.

People living closer to interventions also showed an improvement in perceptions of local environment, relative to the control group.

Headline Findings: behaviour change and travel attitudes

Intercept surveys combined with count data



Low-cost method, suitable for low-cost changes

- Much lower cost, but much less rigorous
- Adds value to existing data and can be used to build up an evidence bank.

The problem with count data alone

- Many schemes include before-and-after pedestrian and cycle counts as routine
- Yet we don't know whether 'extra' walkers or cyclists are 'really' new (new trip/mode shift) or diverting/changing destination.
- This matters for estimating health benefits: health benefits only come from additional km walked or cycled.
- Ideally we would often like more walking and cycling to come from car travel (greater co-benefits).

Combining count and intercept data

An intercept survey can be used to ask pedestrians and cyclists what difference the intervention has made to their trip.

This can then be used to correct the count data, using the proportion of ‘really’ new trips estimated from the intercept surveys.

We can then use a tool like HEAT or WebTAG to estimate the health economic benefit due to those new trips.

The intercept survey can also be used to ask questions about perceptions of the changes.

Key findings

Around a third (30-31%) of additional pedestrians and cyclists recorded post-intervention were 'new'

With count data we then estimated 131-148 new walking and cycling trips daily due to the scheme

Using WebTAG we estimated a 20-year health economic benefit of £250,000-£1,000,000 (the physical measures cost c. £10,000).

The intercept survey also found removing through motor traffic leads to a large perceived improvement in street environment quality

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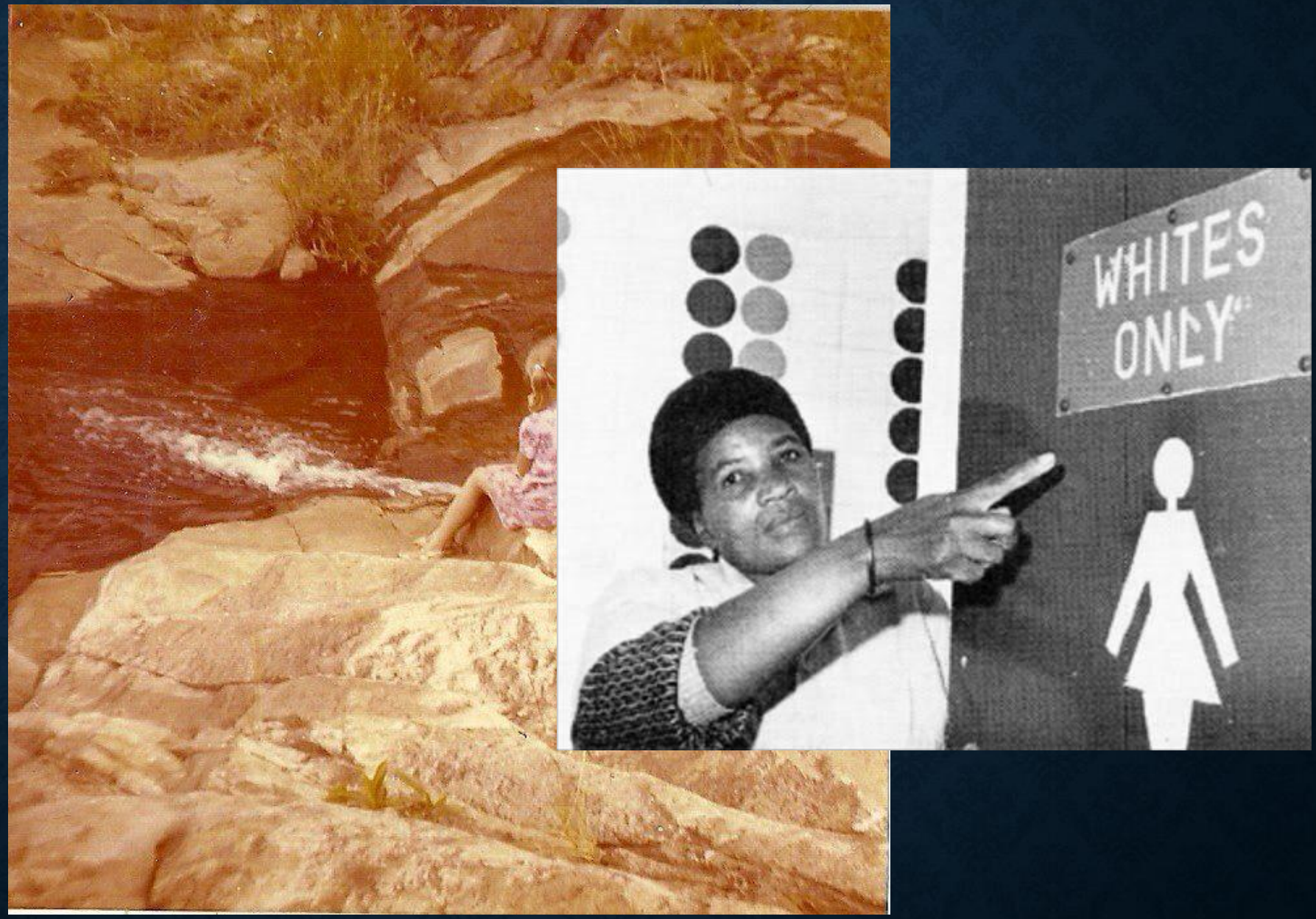
IT'S GOOD TO BE THE KING

A Social Dominance perspective on the cycling experience


WHITES
ONLY


PENNEY
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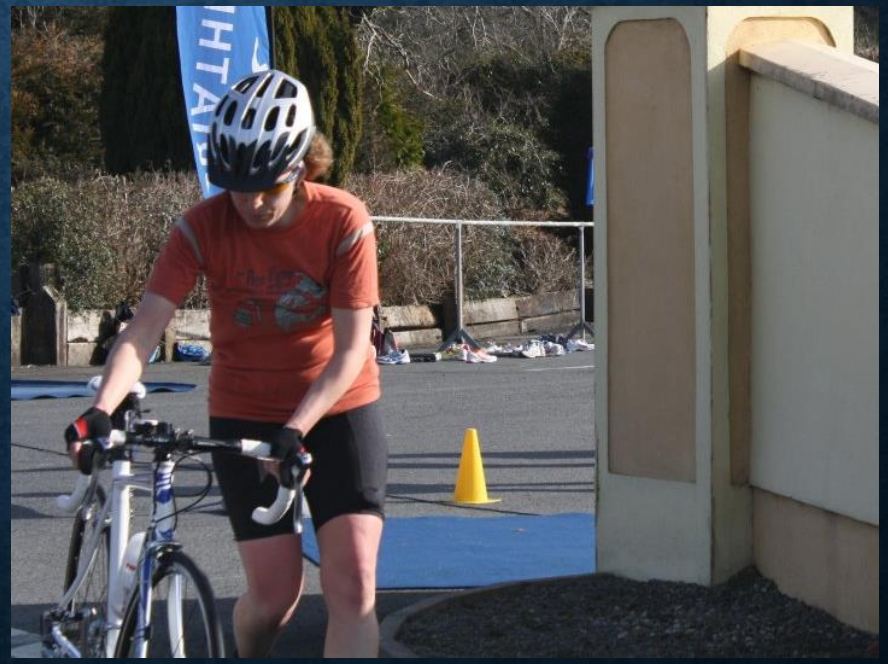
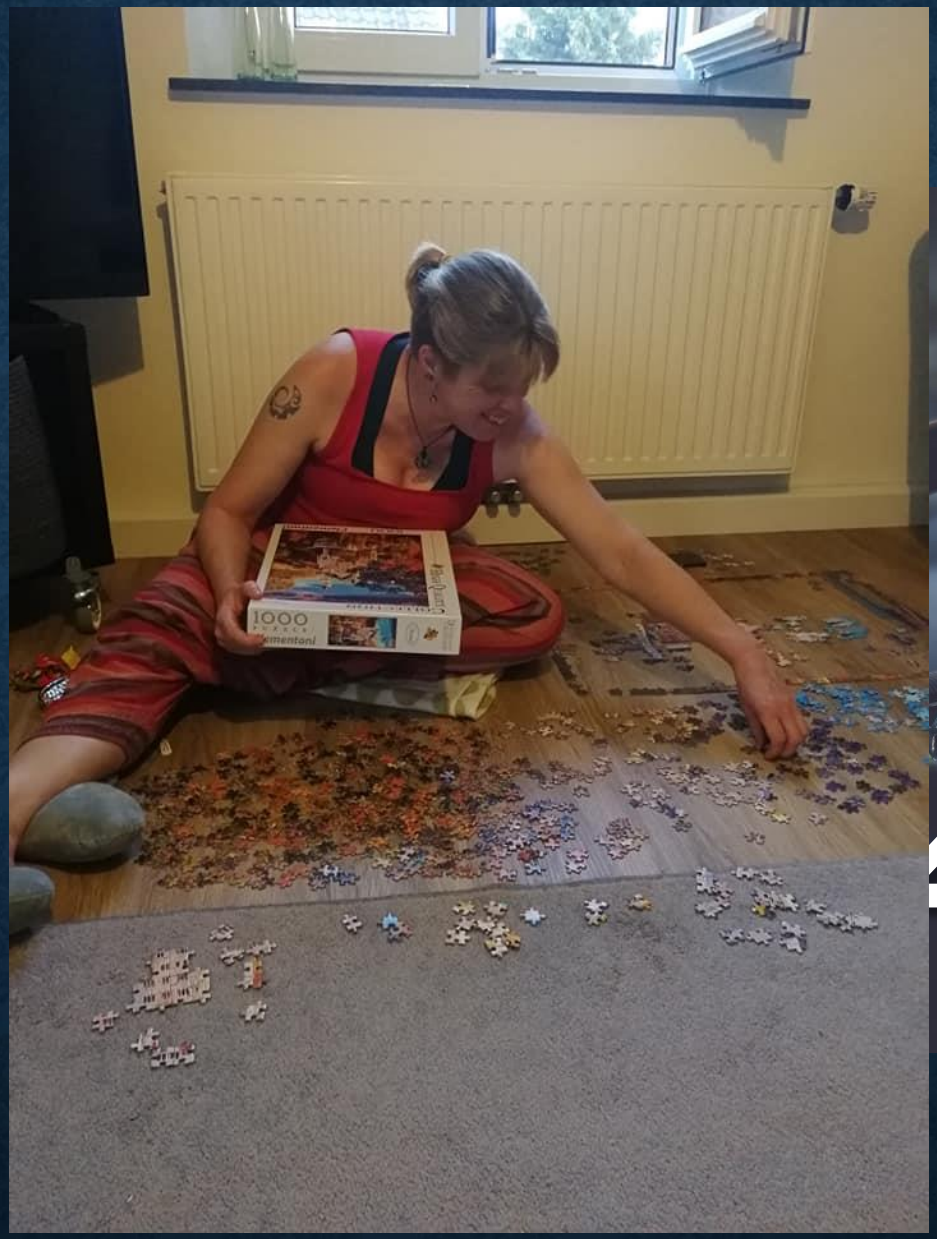



1000


4%

SOCIAL DOMINANCE THEORY (SDT)

"SDT begins with the basic observation that all human societies tend to be structured as systems *of group-based social hierarchies.* At the very minimum, this hierarchical social structure consists of one or a small number of dominant and hegemonic groups at the top and one or a number of subordinate groups at the bottom."

Sidanius and Pratto, 1999, p. 31

HYPOTHESIS

- The **roads network** is a **social system**.
- **Road users** are a stratified, hierarchical order of **social groups**.
- **Drivers are** a **dominant** social group, and **cyclists are** a **subordinate**, deviant, minority outgroup.
- This social dynamic leads to perceived and actual **danger** to cyclists, and to **poor cycling uptake.**

DOES THE THEORY FIT?

CHARACTERISTICS OF A SOCIAL SYSTEM

T.B. BOTTOMORE, 1962
P. 111 – 112

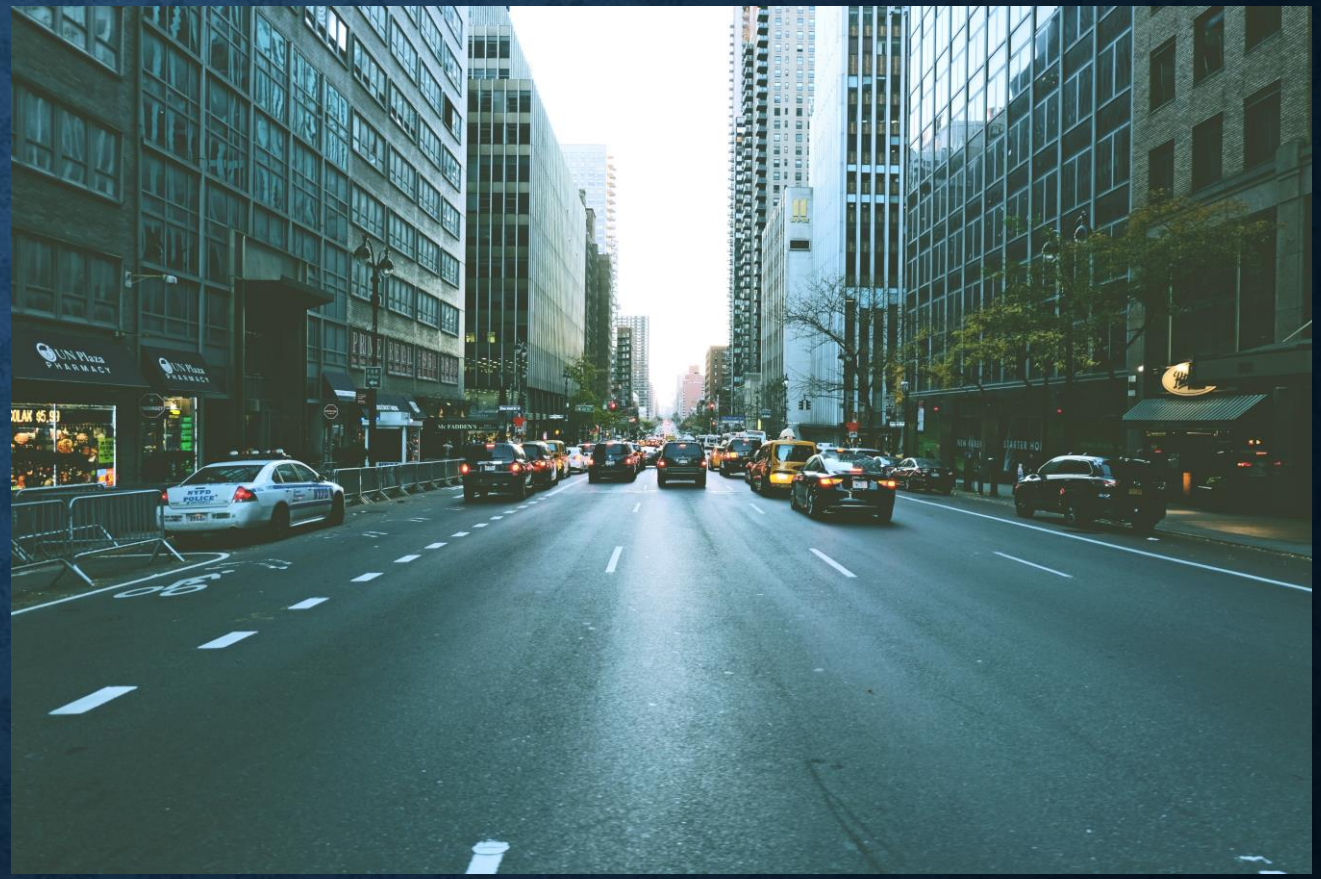
- System of Communication

DOES THE THEORY FIT?

CHARACTERISTICS OF A SOCIAL SYSTEM

T.B. BOTTOMORE, 1962
P. 111 – 112

- System of Communication
- Economic system dealing with the production and allocation of goods



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- System of Communication
- Economic system dealing with the production and allocation of goods
- Arrangements for the socialisation of new generations

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CHARACTERISTICS OF A SOCIAL SYSTEM

T.B. BOTTOMORE, 1962
P. 111 – 112

- System of Communication
- Economic system dealing with the production and allocation of goods
- Arrangements for the socialisation of new generations
- A system of authority and of distribution of power

DOES THE THEORY FIT?

CHARACTERISTICS OF A DOMINANT SOCIAL GROUP

SIDANIUS AND PRATTO, 1999

- Disproportionate possession of social value

DOES THE THEORY FIT?

CHARACTERISTICS OF A DOMINANT SOCIAL GROUP

SIDANIUS AND PRATTO, 1999

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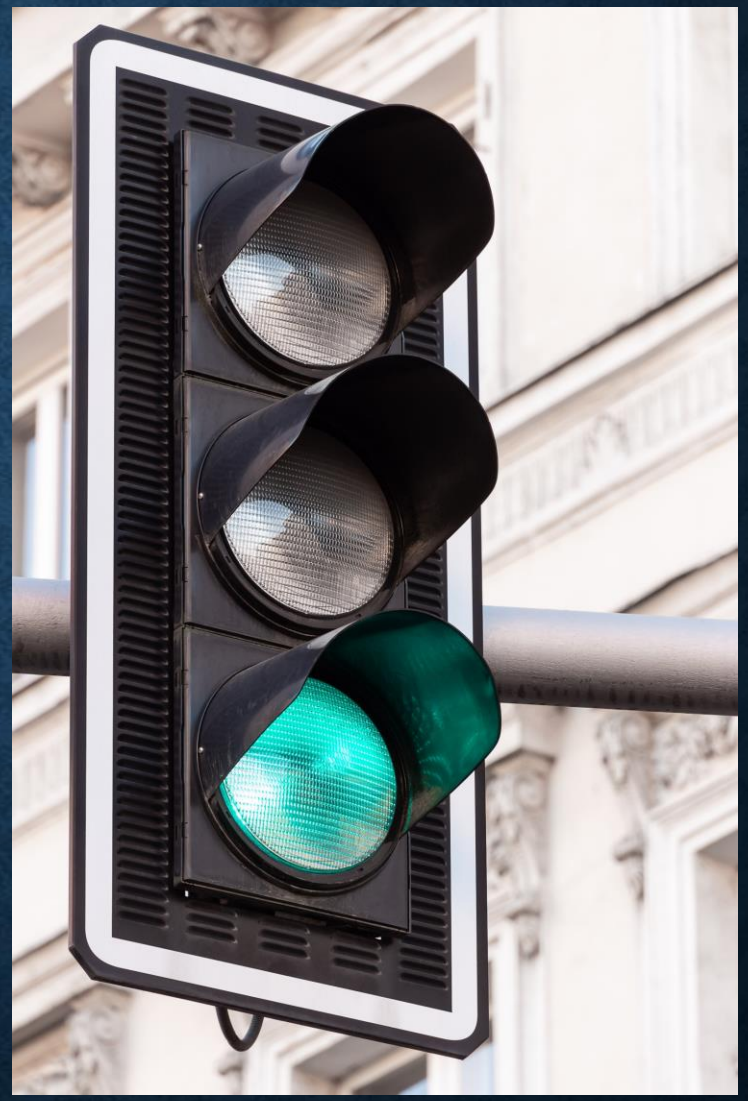
- Disproportionate possession of social value
- Preferential treatment



DOES THE THEORY FIT?

CHARACTERISTICS OF A DOMINANT SOCIAL GROUP

SIDANIUS AND PRATTO, 1999

- Disproportionate possession of social value
- Preferential treatment
- **Tendency to hostility and war**

(Sumner, 1906; Chrissochoou, 2004)

(Walker, 2017; Heesch et al, 2011; Kaplan and Prato, 2016)

TESTING THE HYPOTHESIS

MEDIA ANALYSIS

- Drivers:
  - Representation
  - Legitimisation

TESTING THE HYPOTHESIS

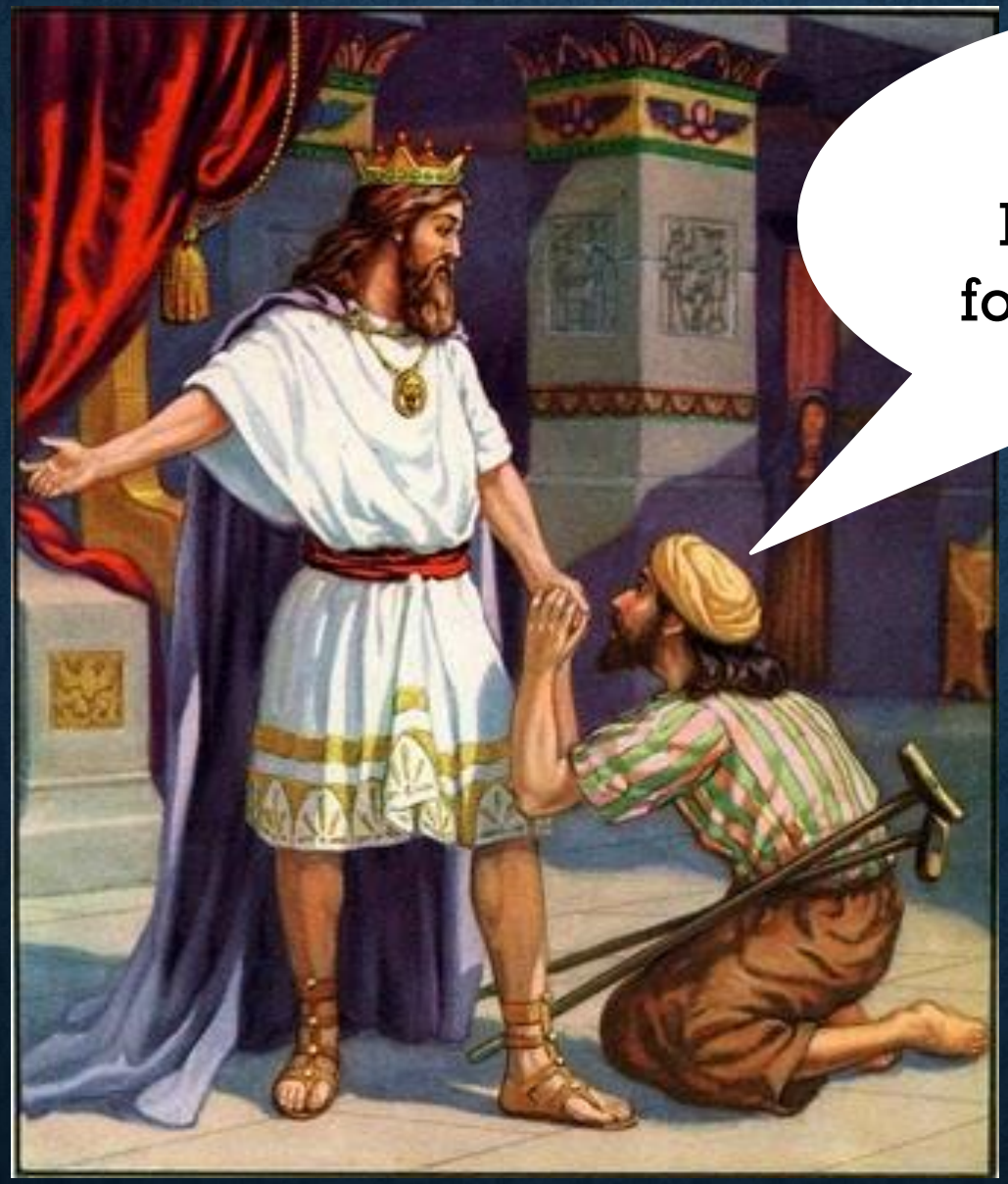
MEDIA ANALYSIS

- Drivers:
  - Representation
  - Legitimisation

- Cyclists:
  - Stereotyping
  - Dehumanisation
  - Cultural Violence

What are we to do?

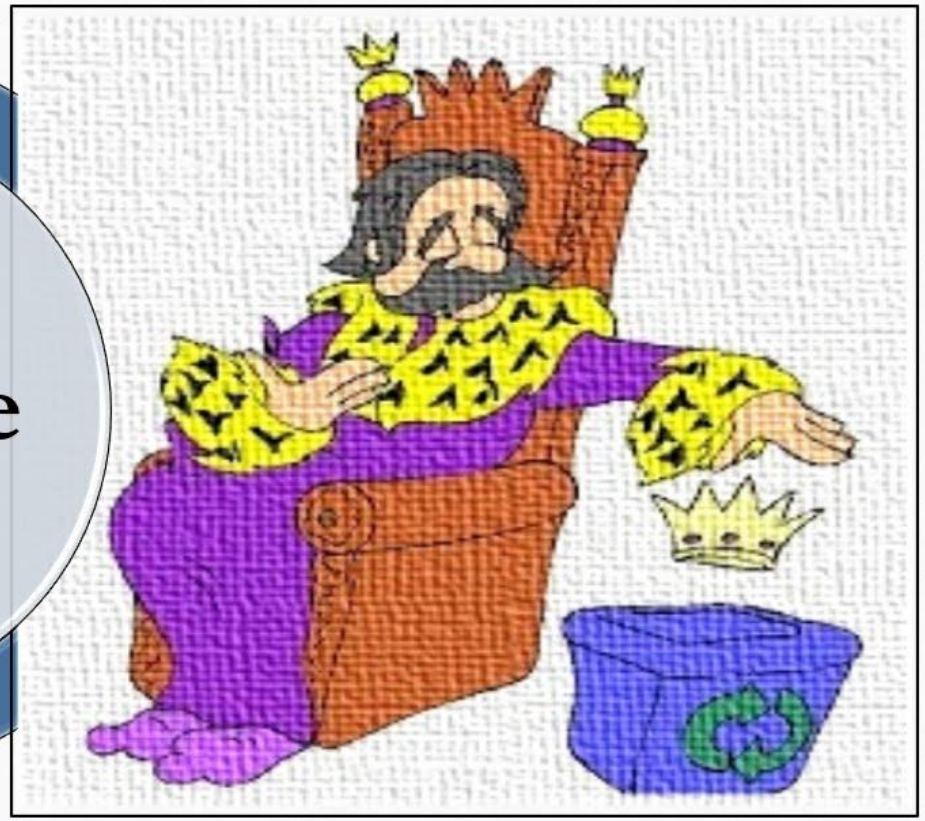
UNDERSTAND AND CONTROL DRIVER DOMINANCE AND ENTITLEMENT


But cycling is healthy, and good for the environment!

GIVE CYCLISTS PHYSICAL AND PSYCHOLOGICAL PROTECTION


McNULTY COACHES

Abdicate



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Recommended for a glimpse of the petty ways in which suffering was inflicted on people of colour in SA:

- Sowetan Live, *Recalling life under apartheid in SA*, 10 December 2013

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