Fourth Stakeholder Advisory Group Meeting
25 April 2016 | Arnolfini | Bristol
Meeting Objectives

1. Report our emerging findings

2. Provide you with an opportunity to scrutinize our approach and findings: suggest possible avenues of further analysis | provide ideas for making an impact in terms of ways of supporting & encouraging older cycling.

3. Hear about a project already supporting older cycling.
<table>
<thead>
<tr>
<th>Item</th>
<th>Time</th>
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<tr>
<td></td>
<td>09.45</td>
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<tr>
<td>1.</td>
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| 4.   |       | Unpacking the preliminary headline findings  
|      |       | ● Cycling Life History Interviews [Kiron Chatterjee and Heather Jones]  
|      |       | ● Cycling Mobility Observation Interviews [Justin Spinney, Ben Spencer & Heather Jones]  
|      |       | ● Cycling and Wellbeing Trials [Carien van Reekum, Louise Leyland & Tim Jones]  
|      | BREAK |       |
| 5.   | 12.30 | Roundtable Discussion |
| 6.   | 13.00 | LUNCH | Cycling and Wellbeing Trial ‘video vignettes’ |
| 7.   | 14.00 | Inclusive Cycling Project for the ‘Over 55s’ | Poppy Brett, Chief Executive, Life Cycle UK |
| 8.   | 15.00 | Workshop Discussions  
|      |       | a) Data gaps and ideas for further analysis  
|      |       | b) Opportunities for impact  
|      |       | c) Reflections in light of Government’s Draft Cycling and Walking Investment Strategy* |
|      | 16.00 | CLOSE |
Study objectives

Objectives
1. To understand cycling among the older population and how this affects independence, health and wellbeing.
2. To advise policy makers and practitioners how our environment and technologies can be designed to help people to continue to cycle in older age or to reconnect with cycling. Read more...
Approach
Mixed methods including analysis of policies and mining existing data sources; case study investigation of UK and EU cities; cycling life history interviews; cycling mobility observation & interviews; and, cycling and wellbeing trials involving electric bicycles. Read more...
Case sites

WHO?
240
People aged 50-59 and 60+

CARDIFF
OXFORD
BRISTOL
READING
<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
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<tbody>
<tr>
<td>Total number of applicants</td>
<td>544</td>
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<tr>
<td>Total number of participants</td>
<td>247</td>
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<tr>
<td>Total number ‘dropped out’</td>
<td>20</td>
</tr>
<tr>
<td>Final participant set</td>
<td>227</td>
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<tr>
<td>[95%]</td>
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### Participant Profile

<table>
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<tr>
<th></th>
<th>Age 50s</th>
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<th>Age 60s</th>
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</tr>
<tr>
<td>Reluctant Riders</td>
<td>6</td>
<td>7</td>
<td>6</td>
<td>14</td>
<td>4</td>
<td>9</td>
<td>16</td>
<td>30</td>
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<tr>
<td>[Biog interview only]</td>
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<tr>
<td>Resilient Riders</td>
<td>20</td>
<td>14</td>
<td>25</td>
<td>20</td>
<td>13</td>
<td>12</td>
<td>58</td>
<td>46</td>
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<tr>
<td>[Mobile observations]</td>
<td></td>
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</tr>
<tr>
<td>Re-engaged Riders</td>
<td>5</td>
<td>7</td>
<td>10</td>
<td>12</td>
<td>2</td>
<td>1</td>
<td>17</td>
<td>20</td>
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<tr>
<td>[Pedal trial]</td>
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<tr>
<td>Re-engaged Riders</td>
<td>7</td>
<td>8</td>
<td>10</td>
<td>12</td>
<td>3</td>
<td>-</td>
<td>20</td>
<td>20</td>
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<tr>
<td>[E-bike trial]</td>
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<tr>
<td>Total age/gender</td>
<td>38</td>
<td>36</td>
<td>51</td>
<td>58</td>
<td>22</td>
<td>22</td>
<td>111</td>
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<td>74</td>
<td>109</td>
<td>44</td>
<td></td>
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<td>227</td>
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</table>
# Integrative analysis of multiple data sources

<table>
<thead>
<tr>
<th></th>
<th>Biographical interview</th>
<th>Mobile Observation</th>
<th>Video Elicitation Interviews</th>
<th>Hours of data</th>
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<tbody>
<tr>
<td></td>
<td>[Audio]</td>
<td>[Video]</td>
<td>[Video]</td>
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<tr>
<td>Oxford</td>
<td>83</td>
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<td>23</td>
<td>117</td>
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<tr>
<td>Reading</td>
<td>35</td>
<td>4</td>
<td>7</td>
<td>46</td>
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<tr>
<td>Bristol</td>
<td>26</td>
<td>14</td>
<td>18</td>
<td>58</td>
</tr>
<tr>
<td>Cardiff</td>
<td>30</td>
<td>18</td>
<td>18</td>
<td>66</td>
</tr>
<tr>
<td>Hours of data</td>
<td>174</td>
<td>47</td>
<td>66</td>
<td>287</td>
</tr>
</tbody>
</table>

*Plus photos; STRAVA traces; Cycling & Wellbeing Trial ‘Diary of Cycling Experience’ (DoCE); associated cognitive tests/PA & wellbeing measures; and, ‘exit survey’. (n=91)*
Conceptual approach driving analysis

Cycling Trajectories | Staging (Velo) Mobilities


**Temporal and Situational:** *Person* (body; relationships) | *Place* (home/neighbourhood/city; social/cultural setting) | *Policy* (national & local policy on planning & transport/trends) | *Technology* (materials & things).
Tool for analysis | Transana CAQDAS

http://www.transana.org/
### Approach to coding

<table>
<thead>
<tr>
<th>Themes</th>
<th>Primary Data source</th>
</tr>
</thead>
</table>
| Participant profile: gender, age, class, ethnicity - cycling trajectory - past practices - current routines - competences - materials | Screening questionnaire  
Timeline/life history grid  
Life History Interview  
Photos  
Memos |
| Ride characteristics: purpose - route choice - rationale - timing - temporality - rhythm - competence | Ride gist (context)  
STRAVA trace  
Observation/memos  
Researcher Video (RRV)  
Participant Video (PRV)  
Video Elicitation Interview (VEI)  
Diary of Cycling Experience (DoCE) |
| Interactions (encounters & negotiations) with 'things': people, place, infrastructure, technology | |
| Meanings bestowed on practices: making sense of actions - personal lifeworld - lifeworld of others; places of significance | |
| Embodied experiences: feelings - sensations | |
| Social context: politics of mobility - reflections on ways of moving and co-habiting space and on built design/infrastructure | Life History Interview  
Video Elicitation Interview (VEI)  
Researcher Memos |

**Abductive**

‘Top down’/deductive approach - application of loose theoretical framework - while applying ‘bottom-up/inductive’ approach through dialogical coding*

*Allowing researchers to collaboratively develop coding themes within and outside of PRIMES umbrella.
## Overarching questions

<table>
<thead>
<tr>
<th>Question</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. How is older people’s mobility constructed and understood in relation to UK policy and guidelines and what policies are in place in the UK and across the EU to support older people cycling?</td>
<td>Policy Review. cB study visit to Munich and Seville.</td>
</tr>
<tr>
<td>2. What are the trends and characteristics of older people cycling in the UK and what has been the effect of recent investment in cycling infrastructure projects, promotional programmes and technological developments?</td>
<td>Secondary Analysis of data.</td>
</tr>
<tr>
<td>3. How is ability and willingness to cycle shaped by individual life events such as family and social relationships, employment and wider social, economic and technological change?</td>
<td>AM: Kiron and Heather</td>
</tr>
<tr>
<td>4. How do specific features of the built environment and assistive technology affect cycling experience amongst older people and what is the impact on wellbeing?</td>
<td>AM: Justin, Ben and Heather</td>
</tr>
<tr>
<td>5. To what extent does cycling improve older people’s cognitive function, eudaimonic wellbeing (human flourishing), hedonic wellbeing (life satisfaction) and physical health?</td>
<td>AM: Carien, Louise, Nick and Tim</td>
</tr>
<tr>
<td>6. What are the implications for cycling stakeholders, policy makers and practitioners?</td>
<td>PM: Over to you!</td>
</tr>
</tbody>
</table>
Emerging Findings
Heterogeneity of Older Cycling

No single ‘older cycling’ narrative

Complex life-worlds

Different experiences

Different personalities

Different capabilities

Different cycling trajectories
### Biographical Interviews

<table>
<thead>
<tr>
<th>Reluctant Riders</th>
<th>Resilient Riders</th>
<th>Re-engaged Riders</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Cycling curtailed in last five years or largely absent through adulthood</em></td>
<td><em>Ongoing engagement /constant activity through adulthood</em></td>
<td><em>Cycling diminished in last five years or absent</em></td>
</tr>
<tr>
<td>Combination of definitive stops and ‘fizzling out’ – cycling less relevant or irrelevant.</td>
<td>Fortunate to have periods of stability/activity space.</td>
<td>Desire to maintain or reconnect with cycling.</td>
</tr>
<tr>
<td>Reservations about cycling’s ability to (continue to) meet mobility needs.</td>
<td>Adapted cycling through their life: riding style/technology.</td>
<td>See opportunity for rehabilitation, ageing well, physical activity.</td>
</tr>
<tr>
<td>Lessening ability and concerns about safety.</td>
<td>Self-sufficient/confident/not uncritical</td>
<td>Lacking confidence; concerns over safety; challenge of re-learning.</td>
</tr>
</tbody>
</table>
### Resilient Riders

Adapted cycling through their life and are self-sufficient and confident.

They try to perform ‘civilised cycling’ and are highly critical of transgressive cycling of ‘others’ – the ‘new breed’.

They employ a range of strategies to minimise journey stress (time and space).

Ageing bodies and reduced range of movement, coupled with poor design, means that riders employ different tactics including making their own (rationalised) transgressions.
## Re-engaged Riders

| Pedal cyclists and e-bike users reported increased wellbeing compared to controls. |
| Effects on cognition not quite as clear cut but cycle trialists tend to outperform controls. |
| Effects are not just due to physical exercise, but engagement with (selected) outdoor settings also plays an important role in improved wellbeing |
| Narrative analysis of qualitative accounts of participation in the trial supports quantitative indicators and elaborate possible mechanisms. |
Understanding pathways of development in cycling in later life

Kiron Chatterjee (UWE) | Heather Jones (UWE)
### Biographical Interviews

<table>
<thead>
<tr>
<th>Reluctant Riders</th>
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<th>Re-engaged Riders</th>
<th>Re-engaging Riders</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Cycling curtailed in last five years or largely absent through adulthood</em></td>
<td><em>Ongoing engagement/constant activity through adulthood</em></td>
<td><em>Reengaged in the last five years following a hiatus of varying length</em></td>
<td><em>Cycling diminished in last five years or absent</em></td>
</tr>
<tr>
<td>Combination of definitive stops and ‘fizzling out’ – cycling less relevant or irrelevant.</td>
<td>Fortunate to have periods of stability/ activity space.</td>
<td>Lessening constraints and new opportunities e.g. downshifting, released from caring</td>
<td>Desire to maintain or reconnect with cycling.</td>
</tr>
<tr>
<td>Reservations about cycling’s ability to (continue to) meet mobility needs.</td>
<td>Adapted cycling through their life: riding style/technology.</td>
<td>Rehabilitation, ageing well, physical activity deficit “need to do something”</td>
<td>See opportunity for rehabilitation, ageing well, physical activity.</td>
</tr>
<tr>
<td>Lessening ability and concerns about safety.</td>
<td>Self-sufficient/ confident/not uncritical</td>
<td>Found a spatial/ temporal niche they feel capable cycling within</td>
<td>Lacking confidence; concerns over safety; challenge of re-learning.</td>
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</table>
Outline

- Approach
- Resilient riders
- Reluctant riders
- Reengaged riders
- Reflections and next steps

With exemplar cases
“dynamically as the consequence of past experience and future expectation as well as the integration of internal motive and external constraint”

(Giele and Elder, 1998)
Interviews

- Narrative interviews
- Visual elicitation
Data analysis

Interview materials examined, case by case

Case summaries and reflective memos

Btw case Commonalities and difference

Preliminary Categorisation

Corroboration and contradiction

Refine categories Identify exemplar cases

Individual biography & contextual change

Bristol cases

Oxford cases

Cardiff + Reading cases

Individual reasoning of continuity and change through life events

How physical, social, cultural change plays out in individual cycling development?

Longer term processes of resilience, reengagement and curtailment

How might resilience and reengagement be supported by policy?
Pathways of development in mid and later life

Time through the life course

Cycling activity

- Continuity
- Expansion
- Diminishing
- Absent
- Curtained
- Restorative
- Resilient
- Reluctant
- Re-engaged

26
Resilient Riders

• Had periods of stable functional bike use which often coincided with consistent activity space

• Had been some gaps

• Re-purposing/adapting cycling through life transitions and events

• Self-sufficient: confident and content to cycle alone
Alfie  M70s, retired engineer, suburbs

Continuous commuting after short hiatus

Volunteering and other functional replace commute

Ad hoc leisure experiences

Cycling on holiday with wife
**did retirement affect your cycling?**  Not really because I started doing other activities right away I started volunteering so that was 2.5 miles to get to that

**So the journeys you made..?**  they just changed a bit, I stopped doing that journey into [work] and did other journeys instead but they were similar, within the bounds of Bristol, just different journeys

…Now I can do it any day of the week… whereas before I might have done a detour on my way home or gone on a Saturday…it’s no trouble to cycle down there but then you’ve got cycle up [hill] …I used to look upon it as a sort of fitness challenge to cycle up, now I tend to push up or avoid it by taking a slightly different route, more of a gentle climb …
Reluctant Riders

• Combination of definitive stops and ‘fizzling out’

• Travel needs shift related to changes in role and location
  o Attractiveness of cycling diminishes relative to other forms of mobility

• Failure to re-purpose or adapt cycling following event

• Array of acute and chronic health issues which undermine capability, comfort and confidence

• Process of mounting dis-ease and doing it less

• Reservations about their bike/ musings about needing a different bike

• Safety concerns: balance of personal competencies/external threats
Reginald M60s retired, emergency services, inner suburbs

- Volunteering uses bike occasionally.
- Attempts recreational cycling intermittently through career.
- Bike in shed unused.
- Hired bikes on holiday.
- Downshifts to local PT work, uses bike but increasingly car because of golf.
- volunteering uses bike occasionally.
  Attempts recreational cycling
  Bike in shed unused
“there has always been a purpose, to get somewhere to do something else…having got the bike to go to school, a bike was then a mode of transport, an efficient and cheap mode of transport which I was happy to go on doing but it wasn’t something that took my interest in its own right.”

“…then it went in the garage, I used it occasionally, I used to go up to [volunteering], having retired and got time so I did that but anything else local, Tesco’s or to the shops just walk. just once or twice I went out for a cycle ride for exercise, to keep fit because not being on my feet every day, I consciously wanted to keep fit ……but me bum hurt…it was so, it was uncomfortable and it was more stressful than walking and trying to find different routes for interest because I didn’t like going there and back again for fun, it’s ok for commuting but if I’m doing something I like to do it in a circle….then I stopped doing that and it’s stopped now for the last couple of years….About a year ago was the last time I used my bicycle…on holiday last year when we hired bikes…”
“Golf and grandchildren”
Angie  F60s, self-employed artist, inner urban

London life
Bike main mode

Increasing tendency to walk to work, enjoys mental space

Youth cycling limited by boarding school

Gets car on move to Bristol Multi modal bike walk car

Increasingly carrying materials and trip complexity necessitates car
“My cycling life has really shrunk actually, not because I can’t or don’t want to, for some reason, particularly at the moment, because I’m doing a lot of things to do with work I have needed to the car to go and buy stuff”

“I used to go on the roads more, I think that I am less confident and I think that’s partly to do with I don’t do it so much, and also an age thing ..... you feel more vulnerable, you know turning your head to see what’s coming and you use a lot of peripheral vision when your cycling and hearing, those things tend to become a little bit less acute....also to do with moving your head, balance and move, checking to see, and all those things combined they are not quite as good as they were.”

“I have been thinking it would be nice to have a decent bike, a sort light weight, with lots of gears .... more user friendly thing in terms of hills to do leisure cycling,..... it would be nice to have one with a motor {laughs}....it seems to be creeping up, that sort of thing”
Re-engaged riders

- Lessening constraints and new opportunities to cycle e.g. downshifting, released from caring responsibilities

- Rehabilitation, ageing well, physical activity deficit “need to do something”

- Found a spatial/ temporal niche they feel capable cycling within

- Others, either as companions or supporters/facilitators, important but not necessary
Leona F50s, fulltime administrator, urban fringe

Youth: cycling, stops at university

Cycles to work

Rural, commutes by car
Occasional leisure with partner

Urbanising move
Initially works city centre
wouldn’t cycle

Job move
urban fringe
positive culture
sedentary job
2/3 times a week

Relationship ends
Occasional short functional/recreational trips
“as a child fairly level, then a big stop while I was at uni, then started again and then there was another stop and then, since I’ve had this new bike, it’s probably grown and as I say I probably cycle more now than I ever have done in my life.”

“very much a fitness thing, cos at work I’m sitting down all day …it’s only been the last 15 months….I started work there then, it’s a 6/7 mile cycle ride which is actually no further to when I worked in the city centre previously…there is absolutely no way I would have cycled from here into the city….. it’s quieter, traffic’s quieter,  

…… and it’s also the attitude of work, if I’m not at my desk until 9.15 it doesn’t matter whereas before I was in financial services and it did …..they have this sustainable travel policy…there are changing facilities, showers…

…I am a fair-weather cyclist, I must admit, October comes and the bike goes in the shed for winter…..some of the ring road path is unlit”
Wilfred, M60s - retired business owner, urban fringe

Youth cycling, first job

Self-employed Business necessitates van

Approaching retirement, family got him bike “I had to do something”

Knee ops

Didn’t enjoy at first

knee issues end sport

Wife gets in to cycling

Focused on business - no time
“about 2008 the kids bought me a bike cos [wife] was biking ….I’d already had a half [knee] replacement ….They bought me a bike and I started just doing a little bit of biking cos I was working still, just out with the kids and that…. the bike was bought for you? : Yeah just to do something {laughs}, encouragement to do something ….as I say I was so embedded in work, my focus was work, building up the business and early retirement”

“Um probably since I retired, 3 years been doing it all the time, cos I’ve been sporty all my life and competitive, you know if I do something I want to win kind of thing, and of course I couldn’t do nothing, so I started cycling”

“I didn’t enjoy it greatly to begin with if honest, I’d go out with my wife and thought “aww gawd 12 miles cycle ride yeah I’ll do it if it keeps her happy, keep her, you know”… it’s just cycling’s boring,…but then gradually you appreciate what’s around you, the scenery and that and going out and stopping in a café”
## Mid and later life

<table>
<thead>
<tr>
<th>Life changes</th>
<th>Examples</th>
<th>Implications for cycling</th>
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<tbody>
<tr>
<td>Relocation</td>
<td>Down-size home, down-shift in work</td>
<td>Physical domain: Distances, topography, infrastructure, safety, aesthetics, cycling culture</td>
</tr>
<tr>
<td>Roles</td>
<td>Retirement/ down-shift</td>
<td>Schedule Potential purposes</td>
</tr>
<tr>
<td></td>
<td>Interests/Volunteering/Caring</td>
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<td>Relationships</td>
<td>New/dissolution/evolution</td>
<td>Social support/influence</td>
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<td></td>
<td>Intergenerational Networks</td>
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<tr>
<td>Health &amp; Wellbeing</td>
<td>Fitness, flexibility, sensory and motor abilities</td>
<td>Capacity and comfort Motivation</td>
</tr>
<tr>
<td></td>
<td>Rehabilitation, management of conditions/ ageing process</td>
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</table>
Movement between pathways

Not cycling in later life
- Absent
- Curtailed

Cycling in later life
- Diminished
- Continuous
- Restored

Desirable

Undesirable
Routes out of cycling

Trauma

Cycling companion stops

Onset of health condition prompts reappraisal of capabilities

Dissatisfaction with and deterioration of bike

Compatibility with travel needs
  need to travel with and transport others and things
  trip chaining
  option of concessionary bus travel

Perceived cycle of diminishing confidence and performing it less
Routes back in to cycling

- Rehabilitation/ Weight management/ Addressing sedentariness
- Making car available to partner
- Beating congestion
- Holiday experiences
- Reduce travel expenditure/ limited other travel options
- Establishing a post-retirement routine
- Shared activity with family members/friends
- Sustained promotion of sustainable travel in workplace
- Rediscovering earlier cycling achievements
Mobile Observations – Video Elicitation Interviews

Justin Spinney & Carl Mann (Cardiff)
Ben Spencer (Oxford Brookes) & Heather Jones (UWE)
## WP5 Summary

### Naturalistic Route
- **Oxford** – 20 Participants
- **Bristol** – 23 Participants
- Investigate where, when, how and why older people ride.
- Explore the strategies and tactics older cyclists use to minimise negative affects

### Waymarked Route
- **Cardiff** – 35 Participants
- **Reading** – 17 Participants
- Explore the tactics older cyclists use to minimise negative affects
- Gather quantitative data on subjective wellbeing
- Investigate patterns in data on wellbeing in relation to specific locations

### Common to both:
- Focus on how the journey and particular locations enhance or detract from wellbeing
- Focus on what cyclists do to minimise or maximise wellbeing
WP5 Summary

Map of Cardiff Waymarked Route

Cardiff

Cycle ride observation map 3m (5km)

START: Glamorgan Building, King Edward VII Avenue  FINISH: Sophia Gardens, Bute Park
WP5 Summary

Map of Reading Waymarked Route

Reading
Cycle ride observation map 2.2m (3.5km)
START: Henley Business School  FINISH: The Forbury Hotel and Gardens
Defining wellbeing

- Subjective wellbeing: Focusing on individual experiences, calculates wellbeing based on judgements about life satisfaction and/or emotional responses to particular situations (Diener 2009)


2. Eudaimonic – An assessment of satisfaction with life goals.
Mobility and wellbeing

• Increasing emphasis on journey quality to enhance wellbeing

• Commute stress caused by longer distances, waiting times, congestion, crowding, lack of predictability (Roberts 2009)

“to promote greater quality of life for all citizens, with the desired outcome of reducing negative impacts on well-being and to promote a healthy natural environment”

(Department for Transport, 2015)
Mobility influences on subjective wellbeing

- Who/what is encountered during and/or following trips
- The nature of the inter-personal interactions
- The means of transport and infrastructures used
- Influence of person’s past experiences, embodied skills and capacities, goals, needs and values
- Cultural and social norms

(Nordbakke & Schwanen 2014:118)
When & Where?

Work/ volunteering:
Oxford – 25%
Bristol – 50%

Leisure/ exercise:
Oxford – 10%
Bristol – 40%

Social/ practical:
Oxford - 65%
Bristol – 10%

What was the purpose of the journeys made by participants?
When & Where?

When did participants cycle?

- Work/ volunteering – largely peak times but some control over when
- Leisure/ exercise – Overwhelmingly outside of peak time
- Social/ practical – Overwhelmingly outside of peak time

“This is a school along [here]…but usually my time is not clashing with that, that's one lucky thing about being retired you can pick your times”

(BM20 – George, 70s)
Implications of when and where?

- Retirement or semi-retirement cited as a time of increased freedom.
- Many older cyclists self-limiting in where and when they ride, in order to minimise journey stress.
- Data suggests tensions between potential freedom and constraints on when and where that freedom can be enjoyed.
Cycling & wellbeing potential

• ‘One of the good things about the bike is that it’s an exercise’ (Timothy, CM001)

• ‘I was just absolutely hooked in it as a great fitness thing’ (Neville, CM009)
Cycling & wellbeing potential

Mental wellbeing

• ‘I had a period where I was being treated for depression… and that was before the cancer… I found myself becoming much more open with people, and a combination of that and much more exercise I am no longer depressed. I feel a whole lot better’ (Vinnie, CM003)

• ‘still get a lot of fun from cycling, out in the country... the metaphorical wind in your hair... being out on your own, certainly on longer rides, it's a bit about adventure, being independent, being responsible for oneself, making one's own decisions' (Lindsey OM014)
Cycling & wellbeing potential

Social Networks

- ‘[Cycling has] certainly improved my quality of life, but I’m not a naturally sociable person. I have friends from work but I have never really sort of been a mixer, generally, but actually the cycling is good because it gets me out with a group of people’ (Bernie, CM010)
Causes of stress

‘How am I going to get across this junction?’ (Eduardo, CM010)

‘I didn’t want to be standing in the middle of a busy junction like that’ (Sibylle CM011)
Causes of stress

Visualisation of participant GSR data North Road – Corbett Road, Cardiff

(CM007)
Causes of stress

Visualisation of participant GSR data North Road – Corbett Road, Cardiff

(CM008)
Causes of stress

Visualisation of participant GSR data Bute Park – Castle Street

(CM003)
Causes of stress

‘It's not like driving, is it? When you know you've always got a lane. On the bike you've got loads of different things, haven't you? Sometimes you have got to cross a pavement, sometimes you've got a cycle lane, and sometimes you're amongst the traffic, sometimes you're in a dangerous spot in the middle of the road. It's nothing like being in the car, is it? (Sybille, CM011)
‘I feel that when I do that, I’ve got sort of a bad neck really – a bit arthritisy so I can’t turn as I should so I feel I’m going to wobble so I’d rather stop’. (Chloe, BM015)
'I find looking over my right shoulder more problematic. It’s about flexibility actually, I suppose you get on and you get less. I use my peripheral vision and also using your hearing… These days you aren’t hearing quite as much cars and much less ‘rattley’ noises’ (Vinnie CM010)

‘when you've got the arthritis you can't turn your neck all the way back without wobbling and the mirror is actually not a lot of good because it is to…moves too much, alright for lipstick!’ (Chloe BM015)
'Most of this year I have been recovering from a cycle accident which did the knees in, well, the knees were down in before that, but being knocked off the bike didn’t make it any better. That’s why I tend to use the pavement to help prop myself up and push myself off with’ (Eduardo, CM010)

‘oh yes, well I try to do that [use the kerb]; I haven't got very long legs…more comfortable on the kerb and better for taking off afterwards [pushes off when lights change] (Gabbi, OM002)
‘It is really hard as you get going again older to get going again. It really is, so I would always try and find a way of keeping going which is exactly what I did there. I was lucky with the light…I will always try and keep momentum…My fitness has gone down, it really has. I'm on these [...] , I'm not sure what it actually is, and my blood pressure is very low…Certainly, I do not want to stop. It's really quite physically hard’

(Sybille CM014)
Ageing and adaptation

**Mirrors:** And I think particularly reflexes and also flexibility - you can't really twist as much as you would like to or to look back, that's one of the big things, and often I've thought 'well what about a mirror?'

**Crossbars:** I got knocked off last year. Which is one of the reasons I don't ride a full size bike anymore. I find it awkward to swing my leg over the cross bar... (Eduardo, CM010)

**E-Bikes:** ‘After attending the CB e-bike demo day in June 2014 participant had bought herself an e-bike as she was impressed with the ease of getting up Headington Hill `sold! A complete convert!’ She chose one that she could cycle easily with the motor switched off so the power would be a ‘backup’ as she wanted the exercise’

**Trikes:** Ridden by a minority of participants, mentioned as a possibility by more as a comprehensive solution to balance and dismounting issues.
Ageing and Tactics: implications?

• Ageing user finds it increasingly hard to improvise in the built environment

• Design guidance assumes a standard user based upon normative assumptions of the young and flexible body

• Discontinuity and illegibility of cycle infrastructure a bigger barrier to cycling for older people

‘So if you know what is expected of you and it’s clear to you then it’s easy to fit in with it’ (Zachary R015)
'if that had a nice distinctive colour all the way across it would be much easier to read, it would really help…when you’re here it’s quite hard to read the far side of it so you can see there’s maybe a traffic light you’ve got to read and you see that kerb and wonder what that does and I’m not at all sure because that’s the pedestrian one right? So what’s that cut through? It’s probably for pedestrians going across there to be fair, but you’d probably be safer if that was all on the one level and it was distinguished by paint or sets. If that was a distinctive colour it would lead you through. It has the potential to be really good’ (Zachary R015).

“Coloured surfaces are not prescribed by TSRGD and they have no legal meaning. There is no obligation to use them” (LTN 2008:19)

“[Cardiff] Council will generally seek to avoid the use of colour surfacing, except in specific circumstances where it is advisable to highlight the presence of a particular infrastructure design feature” (CCDG, 2014:22)
Positive wellbeing

Examples in Oxford:
• River-side path
• Meadows cycle track
• Descending steep hills
• Ring Road cycle track
• Marston Ferry Road
• Iffley Road
Positive wellbeing

• ‘Enjoyable, just a pleasant feeling. I felt with the lack of definition that I could be cycling there I thought people might not be aware…but you have to go very slowly and zig-zag and you don’t know if other people are going to walk in the way and sort of step sideways, that’s the thing that worries me the most.’ (Timothy CM001)

• ‘This is perfect for me now, nobody around. That little dog is a potential hazard…it’s absolutely ideal cycling, I love it, I feel like I’m flying. The fresh air, the beauty of it…then I get slightly distracted by pedestrians and stuff’ (Margaret CM004)

• ‘On anything with shared use, even if it’s got a line on it, you’re not sure of your place, you don’t know if they’re suddenly going to take off this way or that way’ (Zachary, RM015)

“As with a number of other cities and towns promoting cycling (Cycling City and Town) Cardiff Council will implement unsegregated shared use cycle and pedestrian routes” (CCDG, 2014:4).
Conclusions?

“For cycling to be attractive, cycle routes and infrastructure need to be continuous and legible. Cyclists must be able to easily and comfortably follow the route, and should not be, or feel to have been, abandoned by infrastructure at difficult locations…” (CCDG 2014:24)

- Older users employ a range of strategies like taking alternative routes and travelling at different times to minimise journey stress.
- Uncertainty caused by poor/absent design is a key source of journey stress – negatively impacts wellbeing.
- Some older users find it harder to employ tactics due to reduced range of movement – poor design therefore a bigger barrier.
- Design guidance that is based on a minimum range of movement rather than assuming a ‘normative’ flexible and fit body.
- Possibilities of alternative bike designs to mitigate ageing issues virtually absent from policy and design discussions.
Cycling and Wellbeing Trials

Carien Van Reekum & Louise Leyland (Reading)
Nick Beale & Tim Jones (Oxford Brookes)
Cycling, cognition and well-being

Carien Van Reekum
Louise-Ann Leyland
Age and cognitive function

- Age, also in the absence of pathological conditions, is associated with cognitive decline (e.g., Sandberg, 2014; Park, 2000; Salthouse, Atkinson, & Berish, 2003; Salthouse, 2004)

- Executive functions start to decline from the age of 20 onwards
  - Vocabulary continues to increase with age
Brain volume declines from late 20s

Both %GM and %WM in the intracranial space were significantly less in older subjects (≥50 years) than in younger subjects (<50 years; Ge et al., 2002)

Fotenos et al. (2008)
Meta-analysis exercise & cognition

![Graph showing effect sizes for different process-task types reflecting the four theoretical hypotheses concerning the process-based specificity of the benefits of fitness training. Parenthetical notations on the x-axis indicate the number of effect sizes contributing to the point estimates for each task type in the exercise (E) and nonexercise (C) groups. Error bars show standard errors.](image)

Psychological well-being

• It is well known and has been demonstrated previously that cycling has a positive effect on physical health, including for older adults (Pollock et al., 2014)

• Physical function in older adults is related to feelings of well-being. It has been demonstrated that those who are physically active report higher levels of well-being
Mediating factors

• Is exercise and better cognitive performance in older age causal?
• Would cycling improve cognition and well-being due to physical exercise?
  – Role for interaction with environment, the “outdoors”
• Would improved well-being underlie any changes in cognition?
Cycling and older adults

- Physical exercise
- Stimulation
- Navigation
- Social
- Independence
- Increasing mobility
Wellbeing and cognition trial

• Investigate the impact of cycling for an 8-week period on older adults’ cognition and well-being

• Participants, over 50, cycle for an 8 week period
  – At least 1 ½ hours/week
    • Pedal bike
    • E-bike
    • Control – no cycling

• Complete a diary of rides
  – Including other physical activity undertaken

• Cognition and wellbeing are measured before the trial (pre-intervention) and after (post-intervention)
Domains measured

- Wellbeing/affect
- Physical and mental health
- Physical activity
- Cognitive function
  - “Executive function”
    - management (regulation, control) of cognitive processes, including working memory, reasoning, task flexibility, and problem solving as well as planning and execution
- During cycling trial: GPS, diary

Compare pre-trial to post-trial score
Method

- Participants:
  - 77 Middle to older aged (range 51-83 years, Mean age = 62) – not currently cycling
  - Pedal bike: N=33 (out of 40)
  - E-bike: N=32 (out of 40)
  - Control: N=12 (out of 20)
Psychological well-being

- Scales of Psychological Well-Being (PWB, Ryff, 1989)
- Autonomy, environmental mastery, personal growth, positive relations with others, purpose in life, and self-acceptance
- Items include:
  - “I feel good when I think of what I've done in the past and what I hope to do in the future”
  - “People would describe me as a giving person, willing to share my time with others”
  - “I think it is important to have new experiences that challenge how you think about yourself and the world”
  - “With time, I have gained a lot of insight about life that has made me a stronger, more capable person”
**Personal Growth** “Has a feeling of continued development; sees self as growing and expanding; is open to new experiences; has sense of realizing his or her potential; sees improvement in self and behavior over time; is changing in ways that reflect more self knowledge and effectiveness”

**Purpose in Life** “Has goals in life and a sense of directedness; feels there is meaning to present and past life; holds beliefs that give life purpose; has aims and objectives for living”

**Positive Relations with Others** “Has warm, satisfying, trusting relationships with others; is concerned about the welfare of others; capable of strong empathy, affection, and intimacy; understands give and take of human relationships”
Other measures

- Composite executive function
- Verbal fluency scores
- Memory composite scores
Summary and conclusions so far

- It is feasible to provide cycle training for older adults who have not cycled before (or recently).
- Suggestion that both pedal cycling and e-bike use can improve psychological well-being and some executive functions for older adults.
- As those on e-bikes improved as much as pedal cyclists, the increase is likely to be due to the enjoyment/reward and independence gained during the trial and is not necessarily only due to increased cardiovascular health/cerebral blood flow (e.g., Erickson, 2011).
- This has implications for re-engaging older adults with cycling through the use of e-bikes.
Thanks!

Oxford Brookes

Tim Jones - PI
Nick Beale – Project Manager
Benedict Spencer – Mobile rides and interviews

cycle BOOM team

Reading
Emma Street – Urban design guide

Bristol
Kiron Chatterjee - Interviews
Heather Jones – Interviews

Cardiff
Justin Spinney – Mobile rides
Carl Mann – Mobile rides

http://www.cycleboom.org/

EPSRC Pioneering research and skills
Lifelong Health & Wellbeing Research for Healthy Ageing
Oxford Brookes University
Cardiff University
University of Reading
University of the West of England
Wellbeing Trial Exit Survey | Results

Nick Beale (Oxford Brookes)
Q. Please indicate, on balance, how you feel about your participation in the cycling trial [on a scale of 0-10 where 10 is very positive]

n=63

Ave. = 8.9
Q. Please select the statement that best represents your cycling activity SINCE COMPLETING the cycling trial AND your plans over the next 12 months

- I HAVE cycled since and INTEND TO CONTINUE TO MAINTAIN my existing levels of cycling
- I HAVE cycled since and INTEND TO INCREASE the amount of cycling I do
- I HAVE cycled since but INTEND TO REDUCE the amount of cycling I do or to stop cycling altogether
- I have NOT cycled since but I might start to cycle
- I have NOT cycled since but I am planning to cycle
- I have NOT cycled since and I do not intend to cycle

n=63
Cycling purchases since completing the trial

Q. Since completing the trial have you or anyone in your household purchased any of the following:

- Electric bike
- Pedal bike
- Cycle clothing and/or equipment
- No purchase
- Other

[Bar chart showing the number of purchases for each category.]

WP6 E n=33
WP6 P n=30
Q. Please indicate below how YOU perceive YOUR physical activity has changed compared to BEFORE taking part in the cycling trial

Perceived change in physical activity

WP6 E

WP6 P

n=33

n=30
Q. Please indicate below how YOU perceive YOUR wellbeing to has changed compared to BEFORE taking part in the cycling trial

Perceived change in wellbeing

- Declined a lot
- Declined a little
- Neither improved nor declined
- Improved a little
- Improved a lot

WP6 E
- n=33

WP6 P
- n=30
Perceived change in travel behaviour after taking part – e-Bikers

Q. Please indicate below how YOU perceive YOUR travel behaviour has changed COMPARED TO BEFORE taking part in the 8-week cycling trial

![Bar chart showing perceived change in travel behaviour after taking part in an 8-week cycling trial. The chart includes options for 'Not applicable', 'Decreased a lot', 'Decreased a little', 'Neither increased nor decreased', 'Increased a little', and 'Increased a lot'. The data is represented for different modes of transport including e-biking, conventional cycling, walking, driving, public transport, and other. The chart indicates the percentage of participants experiencing various levels of change in their travel behaviour.]

n=33
Perceived change in travel behaviour after taking part – Pedal cyclists

Q. Please indicate below how YOU perceive YOUR travel behaviour has changed COMPARED TO BEFORE taking part in the 8-week cycling trial

n=30
Diary of Cycling Experience (DoCE)

Tim Jones (Oxford Brookes)
Re-engaged riders: ‘diminished’ or ‘absent’

<table>
<thead>
<tr>
<th>Complexities of work-life</th>
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</thead>
<tbody>
<tr>
<td>Job</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Personality – antecedent state</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mode preference</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>No reason! – not uppermost in sphere of consciousness</th>
</tr>
</thead>
</table>
Rationale for participation

Acknowledge:

‘Allure of the e-bike’

Positive antecedent state towards cycling or physical activity.

Health [maintain-improve-overcome]
Alternative mode
Access outdoors – exploration
Regain confidence cycling
Social riding
Overcoming hilly terrain [e-bike]
Time /(in some cases) disposable income
### Diary of Cycling Experience (DoCE)

#### Facts

<table>
<thead>
<tr>
<th>MON</th>
<th>WED</th>
<th>THU</th>
<th>FRI</th>
<th>SAT</th>
<th>SUN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Walking</td>
<td>Cycling (home)</td>
<td>Cycling (work)</td>
<td>Picknickal</td>
<td>No Activity</td>
<td>Cycling (home)</td>
</tr>
<tr>
<td>16:00</td>
<td>18:45</td>
<td>18:45</td>
<td>19:45</td>
<td>18:45</td>
<td>18:45</td>
</tr>
</tbody>
</table>

**Weekly Activities**

- **Monday, 19th August 2012**
  - Walking: 16:00
- **Wednesday, 22nd August 2012**
  - Cycling (home): 18:45
- **Thursday, 23rd August 2012**
  - Cycling (work): 18:45
  - Picknickal: 19:45
- **Saturday, 25th August 2012**
  - No Activity
- **Sunday, 26th August 2012**
  - Cycling (home): 18:45
  - Swimming (home): 18:45

**Personal Reflection on Cycling/Physical Activity**

- How did you feel? What was special about your bike ride alone or with others?

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**Diary of Cycling Experience (DoCE)**

**Design for Lifelong Health and Wellbeing**

**Electric Bike Users**

**Participant Number:** 0-WE-003

**Study Period (Day/month/year):**

- **Start:** 19 / August / 2012
- **End:** 15 / October / 2012

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**Weekly Reflections**

- **Monday:** Walking
  - Start time: 16:00
  - End time: 16:30
  - Level of intensity: Moderate
  - Purpose: Exercise
- **Wednesday:** Cycling (home)
  - Start time: 18:45
  - End time: 19:45
  - Level of intensity: High
  - Purpose: Exercise
- **Thursday:** Cycling (work)
  - Start time: 18:45
  - End time: 19:45
  - Level of intensity: Moderate
  - Purpose: Exercise
- **Friday:** Picknickal
  - Start time: 19:45
  - End time: 21:45
  - Level of intensity: Light
  - Purpose: Exercise
- **Saturday:** No Activity
- **Sunday:** Cycling (home)
  - Start time: 18:45
  - End time: 19:45
  - Level of intensity: High
  - Purpose: Exercise
  - Personal Reflection: How did you feel? What was special about your bike ride alone or with others?
**Diary of Cycling Experience**

**FEELINGS**

A successful week of activities. Having got back in shape, decided to go for another ride to test our endurance. We were not particularly keen, but once we were on the bikes, we were enjoying it. An extremely hilly section of cycle track was encountered, but that did not deter us. The girls were keen to try anything with their bikes. We joined forces and took the Thomas Path, including a short section on the river, which was more scenic. Still using correct power settings and using gears, except short at steep hills, found cycling was not as challenging as before. Strange phenomenon is that it is sometimes better (in some circumstances) to change up a gear going up a hill than to change down, although it is slower. This encourages greater upper body, which must be due to better positioning bringing more assisted power with legs.

Due to the hilly nature of the ride, we have decided to continue with our cycling exercise. We recommend it for all ages and fitness levels. Also, don’t forget to wear your helmet and stay safe.

The bike is a very versatile piece of equipment and can be enjoyed by all ages and fitness levels. Regular cycling is a great way to maintain a healthy lifestyle. It is also an excellent way to explore.
DoCE Narratives – Accounts kept whole

TECH
Re-acquainting
Comfort
Manoeuvrability
Operation
Knowledge-support

BODY
Adapting-learning
Pleasure
Weight loss
Better sleep
Confidence/capability
Pain
Aches
Tiredness
Colds
Crashes!

PLACE
Expanding-discovery
Weather
Infrastructure
Social networks
Nature
Transgressions
REFLECTIONS on Cycling Experience

Overwhelmingly positive experience

Motivation: cycle training & structured plan

Intention: develop & maintain cycling

But partial cycling [time/space]

POTENTIAL CATALYSTS

Awareness/knowledge of healthy ageing
Growth in more supportive/better quality infrastructure
Growth in availability/affordability of E-bikes
Video short

It has been a great experience! I have met new people and made friends and it has made me more independent and outgoing.

Gillian Flynn
Barton, East Oxford
Age: 60s
Pedal cycle trial

Returning to cycling after several years
Video short

My cycling with a conventional bike was getting slower, harder, and less enjoyable, and I have now regained the pleasure of cycling, easier but still giving a reasonable amount of exercise.

Brian Hook
Abingdon
Age: 80s
Electric-bike trial

New to E-bikes after recently reduced pedal cycling
Val Scatchard
Cumnor, Oxford
Age: 60s
Electric-bike trial
*New to E-bikes after recently reduced pedal cycling*

“I would like an e-bike as I live at the top of a 1.5 mile hill...[taking part in the trial] proved the benefit of exile!”

Michael Quirke
Donnington, Oxford
Age: 80s
Electric-bike trial
*New to E-bikes after recently reduced pedal cycling*

“Appreciate value on wellbeing and ease at things...Great experience great team well organised easy to do and of benefit.”
Public Engagement | Outreach | Making an Impact
Impact

Developing more inclusive neighbourhoods, towns and cities

Designing products suited to the growing market of older people
Broader Integration & Outcome

Devised by Emma Street