THE COMMUTING & WELLBEING STUDY
Understanding the Impact of Commuting on People’s Lives
## This afternoon

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
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</thead>
<tbody>
<tr>
<td>14:35</td>
<td>Introducing the study</td>
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<td>Review of international evidence</td>
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<td>15:10</td>
<td>The Commuting &amp; Wellbeing Study approach</td>
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<td>Findings 1: Impact on ‘Domains of Wellbeing’</td>
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Commuting – potential impacts

• The journey to and from work is a routine activity
  • Undertaken on 160 days on average by full-time workers
  • Consumes one hour a day on average (two hours for 1 in 7)
• The commute may be stressful/relaxing, it may be wasted/productive
• But there are good reasons for doing it
• How do the benefits balance against the drawbacks?
Wellbeing

• Subjective wellbeing (SWB) refers to an individual’s evaluation of how well their life is going

• Defined formally by OECD as “Good mental states, including all of the various evaluations, positive and negative, that people make of their lives, and the affective reactions of people to their experiences”
Commuting is changing

• Average commute duration has increased from 24 to 30 mins in last 20 years
• Counteracted by workers travelling less often to their workplace
• Working from home has increased and working practices are becoming more flexible, but not all workers can choose how often and when they travel to work
The Commuting & Wellbeing Study

- ESRC Secondary Data Analysis Initiative project (Feb 16 – July 17)
- Objective to generate novel understanding of the impact of commuting upon people’s lives and provide evidence to support cross-sector policies
- Used data for the lives of over 26,000 employed people living in England, using data from the Understanding Society longitudinal study
Study team

• Researchers at UWE Bristol – Kiron Chatterjee, Ben Clark, Adrian Davis and Deirdre Toher
• Researcher at University of Leeds - Adam Martin
• Project partners
  • Department for Transport
  • Department of Health
  • Department of Communities and Local Government
  • What Works Centre for Wellbeing
Transport and health

• Increasing interest in how transport policies and practices can contribute to better health

• Attention had mostly been on physical health, now turning to mental health and personal wellbeing
“Transport is inextricably linked to the health and wellbeing of our workforce – this must no longer be treated as a separate issue and instead, we call on Government and transport operating companies alike to ensure that the public’s health is a central consideration for all transport planning decisions”
OECD framework for measuring wellbeing and progress

INDIVIDUAL WELL-BEING
[Populations averages and differences across groups]

- Quality of Life
  - Health status
  - Work-life balance
  - Education and skills
  - Social connections
  - Civic engagement and governance
  - Environmental quality
  - Personal security
  - Subjective well-being

- Material Conditions
  - Income and wealth
  - Jobs and earnings
  - Housing

SUSTAINABILITY OF WELL-BEING OVER TIME
Requires preserving different types of capital:

- Natural capital
- Human capital
- Economic capital
- Social capital
Subjective wellbeing as outcome indicator

• “How people think about and experience their lives”
• Meaningful associations shown with range of life circumstances
• How people experience and report on their lives depends on:
  • Psychological resilience in face of adversity
  • Cultural and linguistic influences
• OECD and ONS advocate capturing different:
  • Conceptual components (evaluative, experience and eudemonic)
  • Dimensions (general to domain-specific)
Subjective wellbeing as outcome indicator

Figure 1.1. A simple model of subjective well-being

Importance of the C & W Study

• As will be seen from international review, it fills an evidence gap on how commuting impacts upon the SWB of employed people in England
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Commute stress and boredom

- Studies show commute stress increases with commute time and unpredictability
- Varies with mode

Positives of commuting

• Time to relax, think and ‘shift gears’ between one activity and the next
• Enjoyment of the travel itself
• Productive use of time

Referred to as ‘Gift of Travel Time’ (Jain and Lyons, 2008)
Less time available for other activities

• Those with longer commute times spend less time on leisure activities and sleep less on weekdays (but compensate with more sleep at weekends) (Jones and Thoreau, 2008)

• Those with longer commute times decrease time spent with spouse, children and friends (Christian, 2012)
Satisfaction with commute

- Studies have used Satisfaction with Travel (STS) Scale and variants
- Satisfaction reduces with increasing commute time
- Satisfaction varies with mode (active-car-PT)
- Satisfaction increases with productive use of time, talking to others and flexibility over mode used
Physical health

• Best evidence is from longitudinal data tracking individuals over time

• Evidence from British Household Panel Survey (BHPS)
  • Longer duration commutes are associated with poorer health and more GP visits (particularly for car drivers and women) (Künn-Nelen, 2016)
  • Switching from car travel to walking, cycling or public transport decreases BMI (Martin et al, 2015)
SWB – main determinants

- Good physical health
- Being in employment
- Being married or cohabiting
- Being a younger or older adult
- Higher income (but diminishing returns and relative income more important)
- Gender effects depend on the SWB measure (evaluative or experience)
- Quite stable over time for individuals but affected by major life events

Cross-sectional evidence for impact of commuting

- ONS study based on a sample of 62,000 British workers in 2012/13 found that longer commute times associated with lower SWB (ONS, 2014)
Longitudinal evidence for commuting (1)

• Study based on German panel data for 1985-2003 also found longer commute times associated with lower life satisfaction (Stutzer and Frey, 2008)
• Referred to this as the ‘commuting paradox’
• Economic theory - rational individuals take on more burdensome commutes if compensated by better job or housing (SWB should not be lower for those with longer commutes)
• Explanation was that people incorrectly estimate the effects of commuting and their ability to adapt to it
Longitudinal evidence for commuting (2)

- Study of BHPS data (1996-2008) found longer commute times not associated with lower life satisfaction (Dickerson et al, 2014)
- Another study with same data found they were associated with worse mental health for women (Roberts et al, 2011)
- Study of BHPS data (1991-2008) found walking to work and using the bus improve mental health compared to car commuting (Martin et al, 2014)
Need for further research

- Incomplete picture on how different commuting behaviours affect different aspects of SWB
- Evidence required on how specific changes to commuting behaviour affect SWB and whether impacts grow or diminish over time
- Unclear the extent to which arduous commutes are tolerated and what commuters do to avoid them
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Research Questions

1. What specific aspects of wellbeing are affected by commuting?
2. What does this mean for overall life satisfaction?
3. How is wellbeing affected by different commuting behaviour changes and do impacts grow or diminish over time?
4. What responses do commuters make to arduous commutes?
Data set

• Understanding Society
  • Members of 40,000 households surveyed every year since 2009/10

• Analysis sample
  • Workers living in England (n~26,000)
  • Up to six completed interviews from 2009/10 to 2014/15

www.understandingsociety.ac.uk
# Measures

## Commuting

<table>
<thead>
<tr>
<th>Commute duration</th>
<th>About how much time does it usually take for you to get to work each day, door to door (in minutes)?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commute mode</td>
<td>And how do you usually get to your place of work?</td>
</tr>
</tbody>
</table>

## Personal wellbeing

<table>
<thead>
<tr>
<th>Life satisfaction</th>
<th>How dissatisfied or satisfied are you with your life overall?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Job satisfaction</td>
<td>How satisfied or dissatisfied you are with your present job overall?</td>
</tr>
<tr>
<td>Leisure time satisfaction</td>
<td>How dissatisfied or satisfied are you with the amount of leisure time you have?</td>
</tr>
<tr>
<td>Self reported health</td>
<td>In general would you say your health is [good to poor]?</td>
</tr>
<tr>
<td>Mental health</td>
<td>Based on the General Health Questionnaire scale</td>
</tr>
<tr>
<td>Strain</td>
<td>Have you recently felt constantly under strain?</td>
</tr>
</tbody>
</table>
Life satisfaction

Job satisfaction
Leisure time satisfaction
Self-reported health
Mental health
Constantly under strain

Commuting

Life satisfaction

Evaluative wellbeing

Experiential wellbeing
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Impact of commuting on ‘Domains of Wellbeing’

Job satisfaction
Leisure time satisfaction
Self-reported health
Mental health and strain
Sample characteristics (wave 1)

<table>
<thead>
<tr>
<th>Mode</th>
<th>Percentage using mode</th>
<th>Mean one-way commute time (mins)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive</td>
<td>54</td>
<td>24</td>
</tr>
<tr>
<td>Lift from household member</td>
<td>4</td>
<td>19</td>
</tr>
<tr>
<td>Lift from someone else</td>
<td>2</td>
<td>25</td>
</tr>
<tr>
<td>Motorcycle</td>
<td>1</td>
<td>26</td>
</tr>
<tr>
<td>Taxi</td>
<td>0</td>
<td>20</td>
</tr>
<tr>
<td>Bus/coach</td>
<td>8</td>
<td>38</td>
</tr>
<tr>
<td>Train</td>
<td>5</td>
<td>62</td>
</tr>
<tr>
<td>Metro</td>
<td>4</td>
<td>50</td>
</tr>
<tr>
<td>Cycle</td>
<td>3</td>
<td>20</td>
</tr>
<tr>
<td>Walk</td>
<td>11</td>
<td>14</td>
</tr>
<tr>
<td>Work from home</td>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>27</td>
</tr>
</tbody>
</table>
Analytical approach

Identification of associations between commuting and wellbeing measure

1. Bar charts (indicate shape of relationship)
   - How does wellbeing vary with commuting time and mode?

2. Regression models
   - How does wellbeing vary with commuting time and mode after accounting for other factors
Between vs within person difference

Advantages of panel data:

• Sample includes ~26,000 employed people
  ➢ Examine variation in wellbeing scores between individuals

• Sample includes up to 6 observations - over 6 time points - for each individual
  ➢ Examine variation in wellbeing scores within individuals over 6 observations
  ➢ Eliminates spurious between individual associations arising from possible unobserved personal characteristics

• Greater weight placed on evidence of ‘within individual’ association
## Confidence in findings

<table>
<thead>
<tr>
<th>Confidence level</th>
<th>Rating</th>
<th>Based on</th>
<th>Significance level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very confident</td>
<td>✔ ✔ ✔</td>
<td>Within-individual variation</td>
<td>&gt;=99%</td>
</tr>
<tr>
<td>Confident</td>
<td>✔ ✔</td>
<td>Within-individual variation</td>
<td>&gt;=95%</td>
</tr>
<tr>
<td>Tentative</td>
<td>✔</td>
<td>Between-individual variation</td>
<td>&gt;=95%</td>
</tr>
</tbody>
</table>
Findings sequence

1. Job satisfaction
2. Leisure time satisfaction
3. Self-reported health
4. Mental health and strain
How dissatisfied or satisfied are you with your job?

- 78% mostly to completely satisfied
- Declines with commute time
- Higher for drivers and walkers
Commute time and job satisfaction

**Insight**

Longer commute times reduce job satisfaction (larger effect for bus commutes)

**Confidence**

Very Confident Confident Tentative

<table>
<thead>
<tr>
<th>gender</th>
<th>age</th>
<th>income</th>
<th>area type</th>
</tr>
</thead>
<tbody>
<tr>
<td>larger effect for women</td>
<td>does not apply to 16-29 year olds</td>
<td>larger effect for higher earners</td>
<td>larger effect in metropolitan areas</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Very Confident</th>
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<th>Tentative</th>
</tr>
</thead>
<tbody>
<tr>
<td>within individual (99%)</td>
<td>Within individual (95%)</td>
<td>Between individual (95%)</td>
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</table>
Magnitude of effect

Sensitivity of commute time relative to personal income

On average, the effect on job satisfaction of a 10 minute increase in one-way commute time is equivalent to:

a £480 per month decrease in gross personal income
## Effect of commute mode / WFH

<table>
<thead>
<tr>
<th>Insight</th>
<th>Confidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Working from home increases job satisfaction</td>
<td>✔️ ✔️ ✔️</td>
</tr>
<tr>
<td>Walking is associated with higher job satisfaction</td>
<td>✔️</td>
</tr>
</tbody>
</table>

<table>
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</tbody>
</table>
How dissatisfied or satisfied are you with the amount of leisure time you have?

Evenly spread: 52% reported being satisfied with leisure time availability

A clear downward trend as commute time increases

higher for cyclists and walkers
Commute time and leisure time sat.

Insight

Longer commute times reduce leisure time sat.

Confidence

Very Confident
within individual (99%)

Confident
Within individual (95%)

Tentative
Between individual (95%)

Gender
No different (but women have lower scores)

Age
No different

Income
Smaller effect for mid-income earners

Area type
No different
Effect of commute mode / WFH

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<tr>
<td>WFH increases leisure time sat.</td>
<td>✔️ ✔️ ✔️</td>
</tr>
<tr>
<td>Walking / cycling increases leisure time sat. (larger effect for women)</td>
<td>✔️ ✔️</td>
</tr>
</tbody>
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<table>
<thead>
<tr>
<th>Very Confident within individual (99%)</th>
<th>Confident Within individual (95%)</th>
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In general, would you say your health is (excellent to poor)?

- Nearly 90% indicated good or better levels of self-reported health.
- Higher amongst those with longer commutes.
- Higher for cyclists and rail users.
Commute time and health

A caveat - direction of effect tentatively indicates:
• Healthier people undertake longer duration commutes
• But increasing commute duration for an individual reduces self-reported health score
• Not statistically significant
## Effect of commute mode / WFH

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<tr>
<td>Cycling is associated with higher self reported health</td>
<td>✓</td>
</tr>
<tr>
<td>Bus is associated with lower self reported health</td>
<td>✓</td>
</tr>
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The majority of the GHQ12 responses indicate good mental health.

Scores decrease slightly as commute duration increases. But are higher for those with the longest duration commutes.

Lowest amongst bus users. Highest amongst cyclists.
Commute time and mental health

Insight: Longer commute times reduce mental health (larger effect for bus commuters)

Confidence:
- Very Confident: no different
- Confident: no different
- Tentative: no different
Effect of commute mode / WFH

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<tr>
<td>No effect</td>
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Have you recently felt constantly under strain?

77% of responses - 'no strain' or 'no more strain than usual'

increases with commute time

higher for drivers and rail users
# Commute time and strain

## Insight

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<tbody>
<tr>
<td>Longer commute times increase strain (larger effect for men)</td>
<td>☑️ ☑️</td>
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Apart from for rail commutes:

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<tbody>
<tr>
<td>Longer commutes by rail are less strenuous than shorter rail commutes</td>
<td>☑️</td>
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<td>Walking to work reduces strain</td>
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<td>✔️ ✔️ ✔️</td>
<td>✔️ ✔️</td>
<td>✔️</td>
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Summary: Domains of wellbeing

Commute Time
- Longer duration commutes:
  - Reduce job satisfaction (especially for bus commuters & women)
  - Reduce leisure time satisfaction
  - Increase strain (apart from for rail)
  - Worsen mental health (especially for bus commuters)

Active Commuting
- Walking and cycling
  - Increase leisure time satisfaction (especially for women)
- Walking
  - Decreases strain
  - Increases job satisfaction
- Cycling
  - Is associated with higher self-reported health
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How dissatisfied or satisfied are you with your life overall?

Three quarters reported being somewhat to completely satisfied

Scores are lowest amongst bus users. Cyclists have the highest scores

Decreases *slightly* as commute duration increases
Major determinants of life satisfaction
Effect of time spent commuting

Insight: Longer commute times are associated with lower life satisfaction

Confidence: ✓

A ‘between individual’ association only

- Comparing individuals, longer commutes are associated with lower life satisfaction
- But we did not find that life satisfaction scores reduce for individuals when their commute time increases
Commuting dis-benefits
• Strain
• Job satisfaction
• Time constraints

Commuting benefits
• Income
• Fulfilling job

Commute time compensation?
Unpicking the relationship

Commute Time

+ve
Commuting benefits:
Income, job, housing

-ve
Commuting dis-benefits

Life satisfaction
Unpicking the relationship

Commute Time

-0.057***

Satisfaction with leisure time avail.

+0.014**

Unmeasured benefits of longer commutes

Feeling strained

+0.128***

Life satisfaction

+0.475***

Satisfaction with job

-0.045***

Satisfaction with leisure time avail.

+0.099***

Sig level: 99%***, 95%**, 90%*
Life satisfaction: Conclusion

People are generally successful in trading-off the drawbacks of a longer commute journey against the benefits that they bring.
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Understanding change over time

1. Immediate effects of commuting behaviour changes
2. Evidence that effects grow / diminish over time
3. Longer term effects of sustained commuting behaviours
4. Feedback – Do people make life changes to avoid long duration commutes?
## Immediate effects of behaviour changes

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### Longer run effects of behaviour changes

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How does **starting a long duration commute** affect wellbeing over the longer term?

State: Commute Duration > 45 mins  
Ref: Commute Duration <=15 min

Switch: Short to long duration commute  
T1: 0 - 12 months ago

Switch: Short to long duration commute  
T2: 12-24 months ago

Switch: Short to long duration commute  
T3: 24-36 months ago

Leisure time avail.

Sig level: 99%***, 95%**, 90%*
How does **starting a long duration commute** affect wellbeing over the longer term?

**Implications**
- Long duration commutes are linked to lower satisfaction with leisure time availability (in any period)

**Dynamics**
- The full negative effect of *starting* a long duration commute takes over 12 months to kick in
- It then stays the same…

![Graph showing the effect of long commute on leisure time satisfaction over time.](image-url)
Understanding change over time

1. Immediate effects of commuting behaviour changes
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4. Feedback – Do people make life changes to avoid long duration commutes?
Maintaining the same mode
Maintaining a long duration commute

![Graph showing average life satisfaction score over waves for different commute durations.]

- 1to15mins
- 16to45mins
- 46to180mins
Do people adjust their situation to improve their lives?

Life situation
- Residential situation
- Employment situation
- Socio-demographic characteristics

Commuting behaviour
- Distance
- Mode
- Time

Wellbeing
- Life satisfaction
- Mental health
- Physical health
- Job satisfaction
- Leisure time sat.
The case of long duration commuting (>45 mins)

People start doing a long duration commute to increase their earnings

Indicative earnings change:
• Short to long duration commute:
  £165 per month more in gross personal income on average.

• Short to short duration commute:
  £79 per month more in gross personal income on average.
The case of long duration commuting (>45 mins)

Factors associated with maintaining long duration commute
- Higher income
- Higher job satisfaction
- Rail commuting
- Not active commuting

Factors associated with higher likelihood of changing job
- Being a long duration commuter
- Lower job satisfaction
The case of long duration commuting (>45 mins)

Longer duration commutes maintained if:
- the benefits of higher income and a satisfying job outweigh the drawbacks of the commute journey
Seeking life improvements

• People adjust their lives to improve their situation and to meet their aspirations
• This could explain absence of a strong association between commute duration and life satisfaction
• Remaining questions
  • Complexity of people’s live and processes through which long-term lifestyle decisions made
  • Variation in the extent to which people have agency to improve their situations
C & W Study: The Main Messages

Every Minute Counts

- Every extra minute of commute time reduces job satisfaction, reduces leisure time satisfaction, increases strain and reduces mental health.

The Benefits of Active Commuting

- Walking to work reduces strain and increases leisure time satisfaction.
- Cycling to work increases leisure time satisfaction and is associated with better self-reported health.

Insights for Public Transport

- Bus commuters feel the negative impacts of longer commute journeys more strongly than users of other transport modes.
- Shorter duration commutes by rail are more strenuous than longer duration commutes.

Women’s Work-Life Balance

- Women’s job satisfaction is particularly sensitive to longer commute times.
- Women suffer more than men from lack of leisure time but an active commute (walking, cycling) is found to help with this.

Job Satisfaction and Employee Retention

- Working from home, walking to work and shorter commute times increase job satisfaction and shorter commute times make it more likely that an employee will stay with their job – these are ways to increase employee retention and hence reduce costs to businesses.
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Themes for discussion

1. Job satisfaction and employee wellbeing
2. Active commuting
3. Public transport
Theme 1 - Job satisfaction and employee wellbeing

What actions can be taken to help employees find attractive housing close to their workplaces?

What can be done to ensure different transport alternatives provide reasonable journey times to employment destinations?
Theme 2 - Active commuting

How can networks be developed to support safe and relaxing access to employment destinations on foot and by bicycle?

What can be done to promote the physical and mental health benefits of active commuting and increase the uptake of active commuting?
Theme 3 - Public transport

How can the infrastructure and services necessary for good quality local public transport access to employment destinations be developed?

What can be done to enable rail operators to provide comfortable conditions for commuters?