The Netherlands Mobility Panel (MPN)

Approach, motivation and results

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History

Several long-running (travel data) surveys in the Netherlands

- Since 1975 – Time Budget Survey every 5 years
  - 2,000 households, limited amount of mobility data
- Since 1978 – Dutch National Travel Survey (1 day, cross-sectional, 40k respondents)
  - Limited number of personal and household characteristics
  - Detailed mobility data
- 1984-1989 – Longitudinal Mobility Survey (LVO) (7 days, twice a year, 1,500-2,000 households (3,500 people of 12+)
  - Extensive list of personal and household characteristics
  - Detailed mobility data
Issues with the Longitudinal Mobility Survey (LVO)

- High response burden
  - Trip diary and a personal interview

- High attrition rates (up to 47%)

- High costs & time consuming

In 2013: the MPN started
Why a new panel?

› Explain trends in travel behaviour on an aggregated as well on an individual level
› Uncover individual day-to-day variation (habit)
› Uncover individual year-to-year variation (life events)
› Study influence of intra-household interaction on travel behaviour
› Better calibrate/validate large strategic transport models
› Enable estimation of travel choice models
Design of the MPN

› Household panel
› Web-only
› No rotation scheme
› 1 wave per year
  – Screening questionnaire
  – Household questionnaire
  – Personal questionnaire
  – Three-day trip diary
    ▪ Place-based diary
Design of the MPN (2)

› Aim is 2,000–2,500 complete households
  – 4,000 – 5,500 respondents
› All household members of 12+ years participate

<table>
<thead>
<tr>
<th></th>
<th>2013</th>
<th>2014</th>
<th>2015</th>
<th>2016</th>
<th>2017</th>
<th>2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complete households</td>
<td>1,978</td>
<td>2,095</td>
<td>1,575</td>
<td>1,759</td>
<td>2,753</td>
<td>2,985</td>
</tr>
<tr>
<td>Complete respondents</td>
<td>3,996</td>
<td>5,551</td>
<td>3,919</td>
<td>4,359</td>
<td>5,368</td>
<td>6,100</td>
</tr>
</tbody>
</table>

› Kantar Public (previously TNS Nipo) maintains panel
› Incentives:
  – €10,- per complete household
  – Raffle complete respondents (1,000 vouchers for online retailer)
  – Raffle complete households (40 vouchers for household activity (zoo, amusement parks etc.))
Some key differences with the MOP

› Web-only

› No rotation scheme

› Three-day diary
Key difference 1: Web-only survey

- Easy to process data
- Extra possibilities (metadata, checking answers etc.)
- Respondents come from existing online-access panel (Kantar Public)

- Risk: excluding people without internet?
  - 98% of Dutch households have an internet connection (2017)
  - 87% of Dutch individuals (16-75 years) have internet on their mobile phone
Key difference 1: Web-only survey (2)

- Metadata, for instance:
  - Duration of questionnaire
    - Identify speeding
  - Time between travelling and reporting trips
  - Device

- Other extra possibilities
  - Use previous given answers
  - Directly check answers (postal codes, license plates, access-egress etc.)

<table>
<thead>
<tr>
<th>Percentile answering speed</th>
<th>Reported immobility</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>16-17y</td>
</tr>
<tr>
<td>0 – 5 %</td>
<td>23.3 %</td>
</tr>
<tr>
<td>5 – 10 %</td>
<td>29.7 %</td>
</tr>
<tr>
<td>10 – 15 %</td>
<td>25.4 %</td>
</tr>
<tr>
<td>15 – 20 %</td>
<td>14.7 %</td>
</tr>
<tr>
<td>20 – 100 %</td>
<td>15.8 %</td>
</tr>
</tbody>
</table>
Key difference 2: No rotation panel

› MPN originally funded for 4 years

› Respondents are recruited to participate indefinitely

› Group of respondents that participate 3+ waves is growing

<table>
<thead>
<tr>
<th>Waves completely participated</th>
<th>Number of respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4,552</td>
</tr>
<tr>
<td>2</td>
<td>3,504</td>
</tr>
<tr>
<td>3</td>
<td>1,532</td>
</tr>
<tr>
<td>4</td>
<td>788</td>
</tr>
<tr>
<td>5</td>
<td>977</td>
</tr>
<tr>
<td>6</td>
<td>850</td>
</tr>
</tbody>
</table>
Key difference 3: Three day diary

› Not full week, but three day diary
  - Reduce response burden
  - Reduce risk of diary fatigue
  - Reduce risk of panel attrition

› Respondents have same starting day each year

› No significant diary fatigue effects
Redesign of the MPN

› All survey tools updated in 2018
  - First five years only limited changes were made
  - Technology evolved
  - Design and possibilities of the survey tools not future-proof

› Goal:
  - Modernize and improve design while keeping changes to a minimum
  - Improve survey experience
  - Reduce response burden → reduce risk of panel attrition
  - Have more flexible survey tools
  - Have a monitoring system
Redesign: questionnaire

› Main objective: multi-modal accessibility
  – Adaptive design
  – Only vertical scrolling
  – Split-up grid questions for mobile devices

› Create possibility to program questionnaires ourselves

› Questions didn’t change!
Redesign questionnaire - example
Redesign diary

› Main goals:
  – Modernize diary
  – Improve user experience

› (Some) new possibilities
  – Google Places API to search for addresses
  – Select cars in the household with a car trip
  – Implement checks to ensure for instance that access and egress trips are reported correctly
Redesign diary - example

Mobiliteitspanel Nederland > Dagoverzichten

Terug naar Home

Dag 1

Dag 2

Dag 3

Locaties en activiteiten van dag 1

Val hier alle locaties in die u deze dag bezocht hebt. Als alle locaties van de dag zijn ingevoegd, kunt u vervolgens uw verplaatsingen toevoegen.

Gecontroleerd

25-05-2018

vrijdag

Thuis

Thuis zijn

10:00

tot 15:00

→

Werk

→

Hoe ver heeft u gereden om van Thuis bij Werk te komen tussen 07:55 uur en 08:23 uur?

23 km (afstand in km, bijv.: 5,60, 1,5 of 0,01 km)

Vervoermiddelen

Hier voert u de vervoermiddelen in die u voor uw reis van Thuis naar Werk heeft gebruikt.

Met welk vervoermiddel bent u vertrokken van Thuis?

Lopen

Met hoeveel mensen reisde u samen?

Ik reisde alleen

Heeft u nog een vervoermiddel gebruikt of bent u overgestapt tijdens uw reis van Thuis naar Werk?

Ja

Nee

Opslaan

Annuleren

KiM Netherlands Institute for Transport Policy Analysis

12/9/2019

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Redesign diary – Google Places

› Exact addresses often unknown *(supermarket, gym, cinema etc.)*

› Google Places implemented to search addresses (e.g. by name of supermarket)
Redesign – monitoring system
Recently conducted research using MPN data

- Life events and transitions in travel patterns
- Different groups of (e)shoppers and their mobility
- Relationship between car ownership, car availability and car use of adolescents
- Relationship between health and travel behaviour
- E-bike substitution effects
Relationship between health and travel behaviour

› How is health related to travel behaviour?

› BMI, subjective health and amount of physical activity
Some conclusions:

- People with a healthy weight cycle more frequently and use car less often.
- Obese people use e-bikes more frequently and walk less
- People with a healthy weight stick to an active travel pattern more often
- No conclusions about causality (yet)!
Substitution effects of the e-bike

› More e-bikes sold in 2018 in the Netherlands than regular city bikes

› E-bikes have the potential to replace car/PT trips
  - → potential health/environmental benefits

› Previous studies on substitution effects use cross-sectional data/in-depth interviews
  - Behavioural changes not observed
Substitution effects of the e-bike (2)

- First study with a large-scale panel into substitution-effects of e-bike
- In general: e-bike only substitutes the conventional bicycle
- However, for commuting, it also substitutes car!

<table>
<thead>
<tr>
<th>Dependent</th>
<th>Car as driver</th>
<th>Train</th>
<th>Bicycle</th>
<th>E-bike</th>
<th>Walk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Autoregression (first-order)</td>
<td>0.269 (0.000)</td>
<td>0.281 (0.000)</td>
<td>0.208 (0.000)</td>
<td>0.389 (0.000)</td>
<td>0.481 (0.000)</td>
</tr>
<tr>
<td>Autoregression (second-order)</td>
<td>0.060 (0.024)</td>
<td>0.053 (0.036)</td>
<td>0.034 (0.125)</td>
<td>0.263 (0.000)</td>
<td>0.205 (0.000)</td>
</tr>
<tr>
<td>Car as driver (t-1)</td>
<td>-</td>
<td>-0.020 (0.003)</td>
<td>-0.016 (0.171)</td>
<td>-0.007 (0.398)</td>
<td>-0.004 (0.479)</td>
</tr>
<tr>
<td>Train (t-1)</td>
<td>-0.068 (0.148)</td>
<td>-</td>
<td>-0.028 (0.347)</td>
<td>-0.005 (0.333)</td>
<td>0.004 (0.764)</td>
</tr>
<tr>
<td>Bicycle (t-1)</td>
<td>-0.006 (0.835)</td>
<td>-0.018 (0.067)</td>
<td>-</td>
<td>-0.019 (0.197)</td>
<td>0.017 (0.045)</td>
</tr>
<tr>
<td>E-bike (t-1)</td>
<td>-0.102 (0.017)</td>
<td>-0.005 (0.760)</td>
<td>-0.056 (0.047)</td>
<td>-</td>
<td>0.003 (0.797)</td>
</tr>
<tr>
<td>Walk (t-1)</td>
<td>0.083 (0.146)</td>
<td>0.045 (0.030)</td>
<td>-0.012 (0.742)</td>
<td>0.010 (0.508)</td>
<td>-</td>
</tr>
</tbody>
</table>

*P-values are presented in parentheses, parameters with p<0.05 are bold*
Thank you!

› Data (anonymized) is public, request access through the MPN website:
  – https://www.mpndata.nl/

› Publications can be found on the KiM website:
  – https://english.kimnet.nl/the-netherlands-mobility-panel/publications

› For questions, contact me!
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  – Mathijs.de.Haas@minienw.nl