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Person Daily Vehicle Kilometres Travelled Trends in the USA, Victoria, Australia and Germany

Analysis to explore changes over the past 15-25 years

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Definition - Person daily vehicle kilometres travelled

Average daily vehicle kilometres travelled by a person in a day in a week. Where a trip is shared with household members, the distance is equally distributed amongst household members. This discounts non-typical daily travel such as long trips.

Aim

Assess changes in travel behaviour using revealed average daily person vehicle kilometres with data from Victoria, Australia, Germany and the USA. This change is to be explored to understand consistency in travel behaviour at an aggregate and disaggregate levels when considering the household location and household income.

Methodology

Data

Germany:	Mobility Panel Germany
USA:	National Household Travel Survey
Victoria, Australia:	Victorian Integrated Survey of Travel and Activity

Data Adjustments

- Revise to daily travel patterns:
  - USA – retain existing recordings/weighting
  - Victoria – combined weekend and weekday weights to create daily travel
  - Germany – divided total distance by 7 as it is a week-long survey
- Cleaned data (removed errors/outliers)
- Revised weights (separate to above)

Person level variables

Household location
- Inner urban
- Outer urban
- Second city
- Rural

Household vehicles
- 0 vehicles
- 0-1 vehicle per driver
- Greater than 1 vehicle per driver

Age group
- 0-17
- 18-35
- 35-50
- 50-65
- 65+

Household income
- Country currency specific 4-5 categories

Gender

Person has driver's license

Education level
- Secondary school with vocational/graduate certificate
- Secondary school with no vocational/graduate certificate
- No education
- University entrance diploma
- University diploma

(not available for Victoria)

Person type
- Working adult with children
- Working adult without children
- Non-working adult with children
- Non-working adult without children
- Adult student with children
- Adult student without children
- Retiree
- Child
- Other

Person level variables

Cross-sectional linear regression model with time-effects.

Years modelled

	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Victoria													X		X			X	X	X	X	X	X	X	X	X		
Germany		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
USA	X						X								X								X					X

Approach

Consider fixed travel behaviour for the base year applied to future population composition for each observed year. This fixed travel behaviour is used to estimate how people would travel in a counterfactual scenario – being alternative years to 2017.

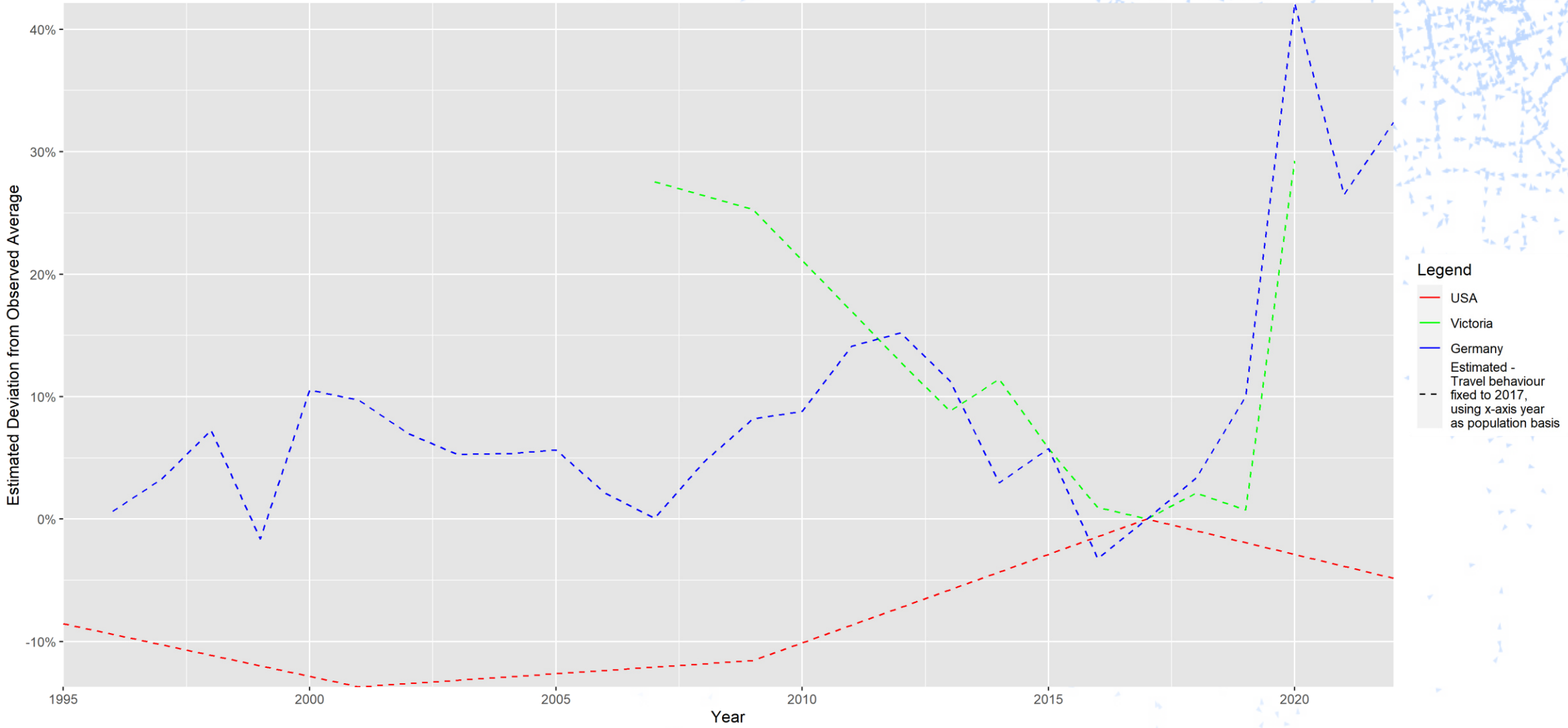
Compare the counterfactual scenarios to the observed scenarios to draw conclusions on changes in travel behaviour.

Observed Average Distance Travelled

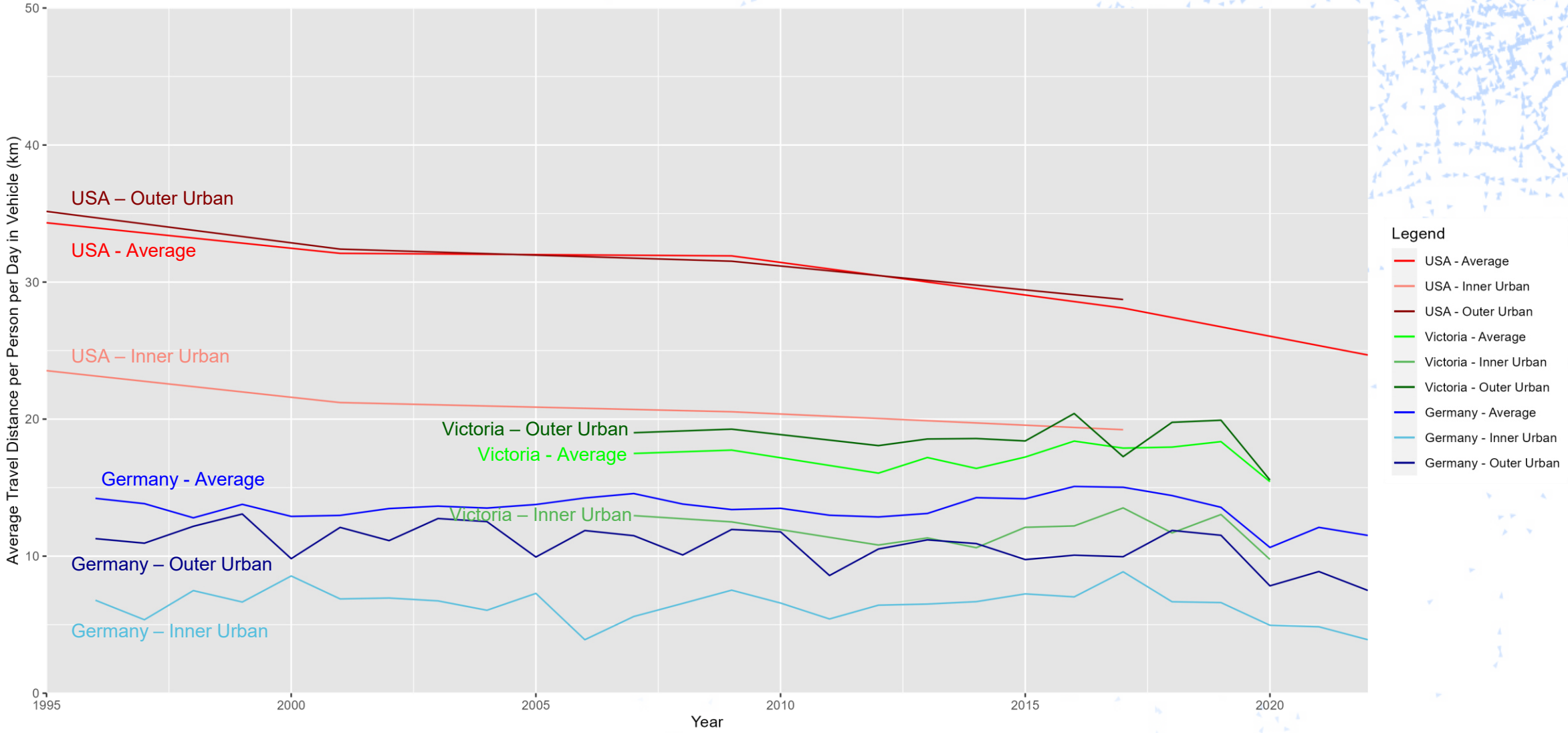
Distance Travelled + 75th and 25th Percentiles

Distance Travelled + Estimated to 2017 Travel Behaviour

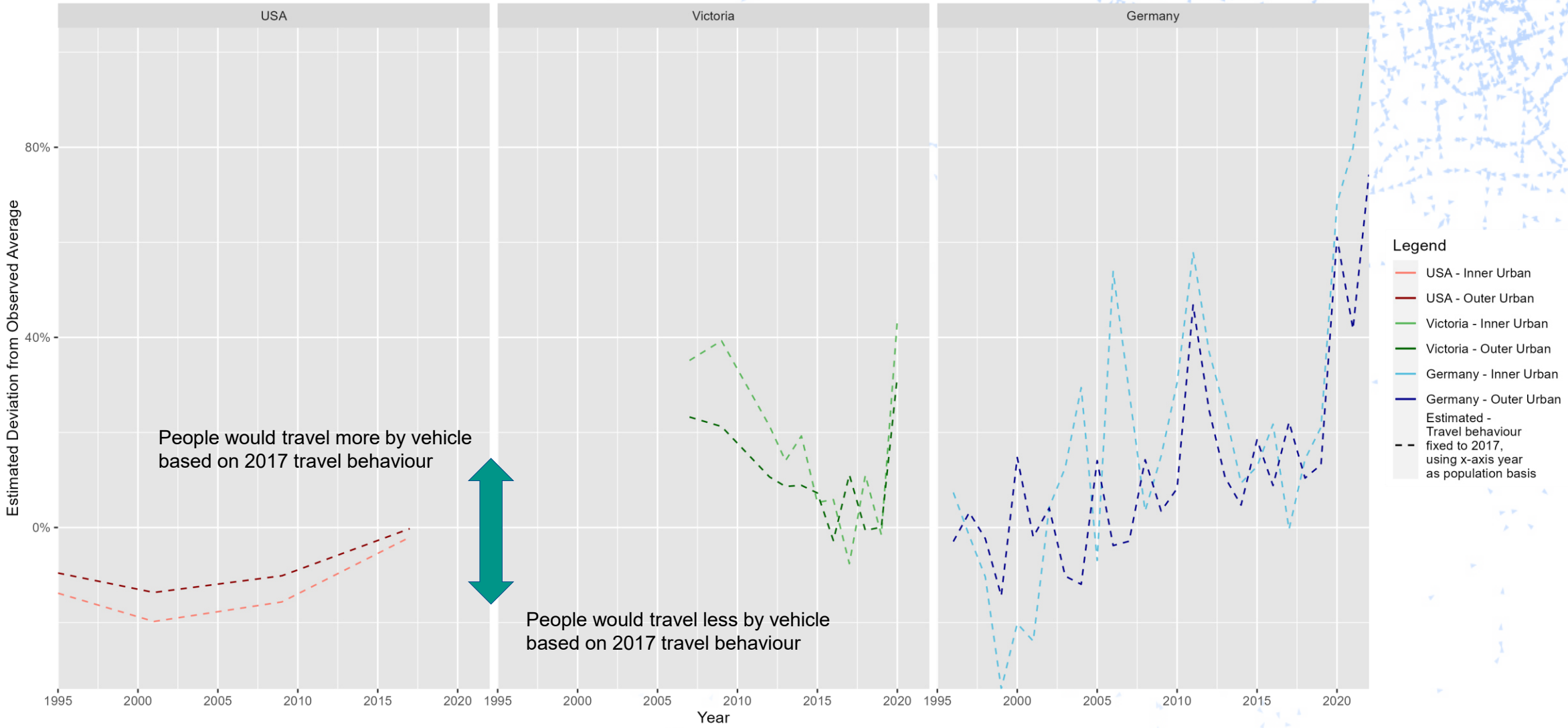
Deviation of the Estimated to the Observed Distance Travelled



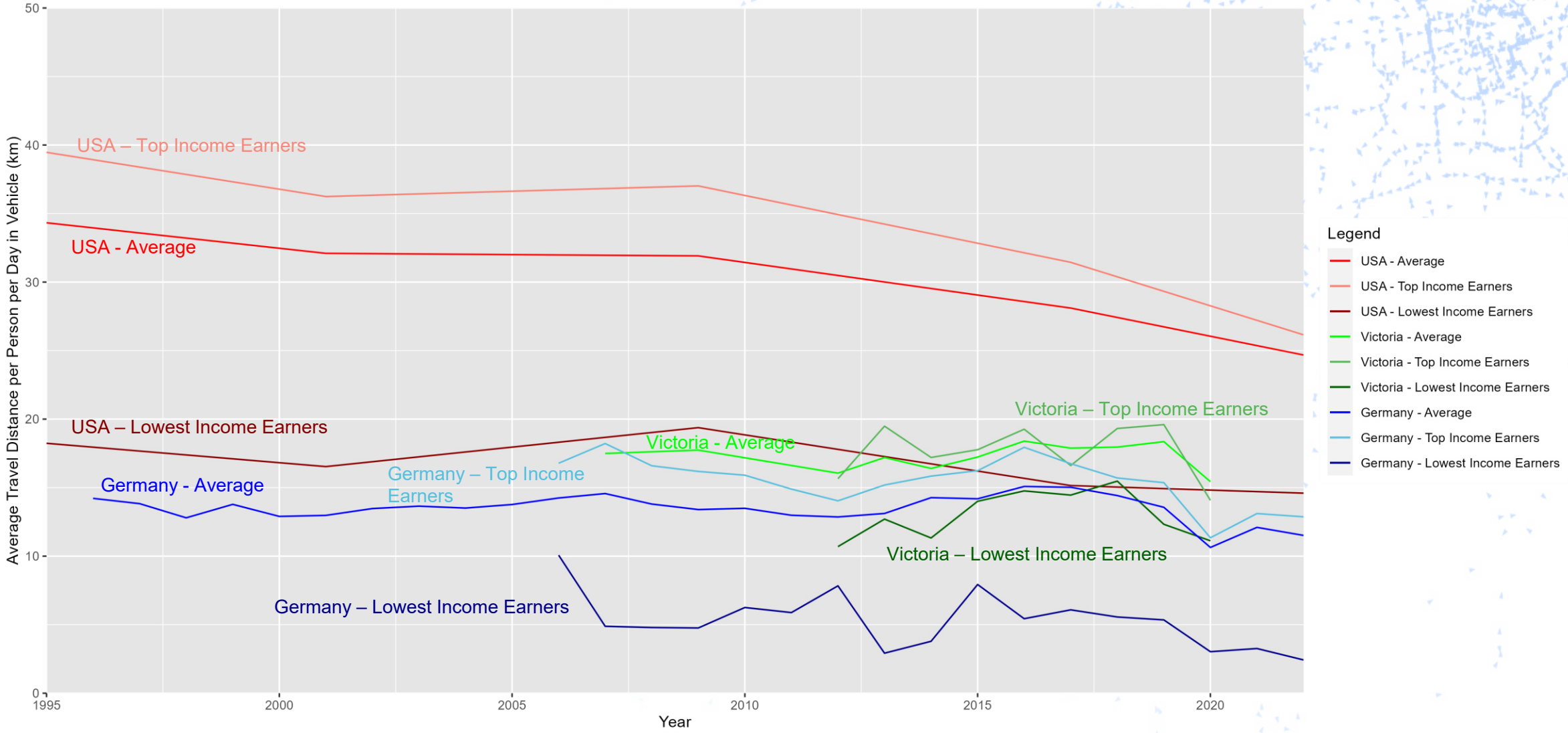
Distance Travelled by Household Location



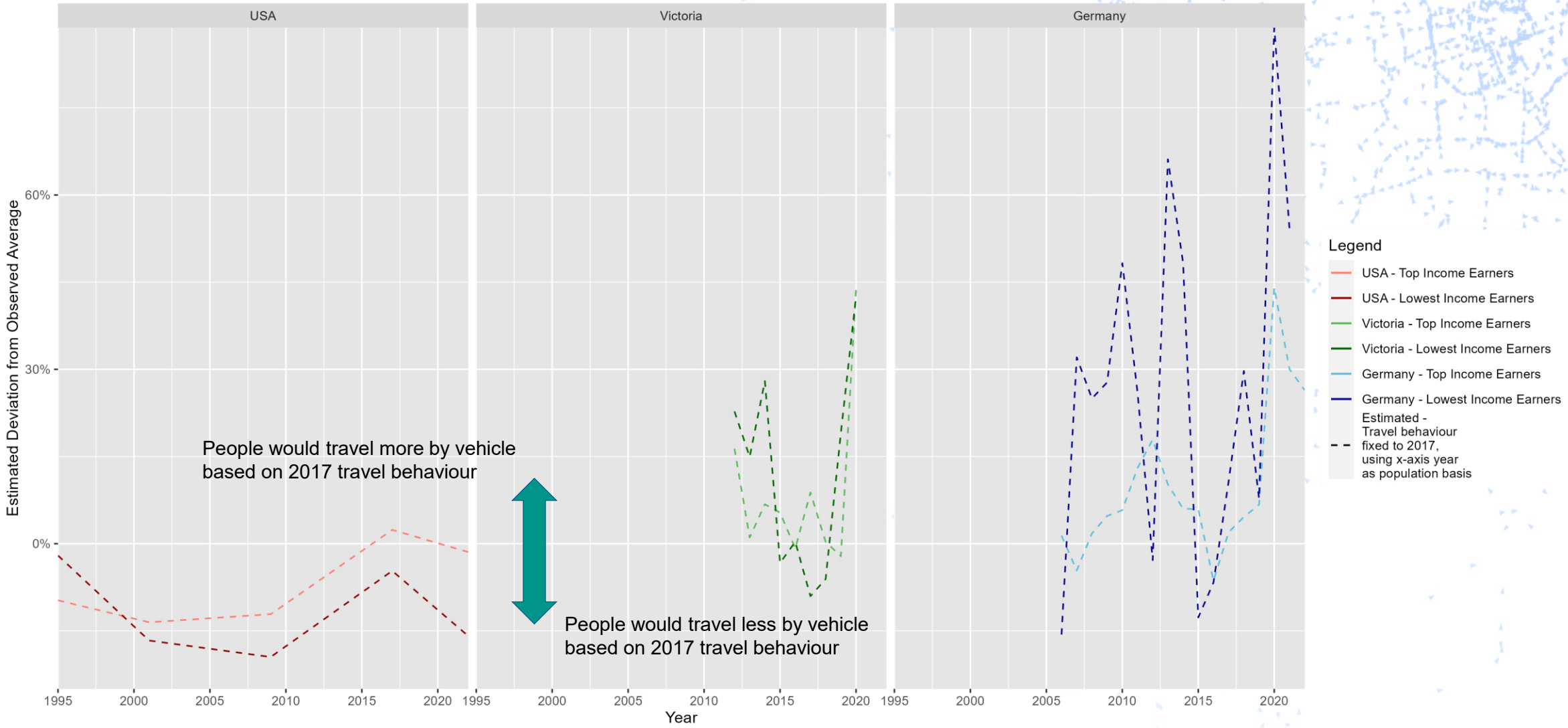
Deviation of the Estimated to the Observed Distance Travelled



Distance Travelled by Household Income



Deviation of the Estimated to the Observed Distance Travelled



Key Takeaways

Aggregate Level

- German travel is relatively stable, USA has seen a reduction in reliance with vehicles and Victoria has seen an increase in reliance of vehicles

Household Location

- In Victoria and the USA, inner urban areas have seen a greater change in travel behaviour, than in outer urban areas. In Germany, potentially because of the already high usage of transit and active transport, behaviour has been more stable in these areas.

Household Income

- In all three locations higher income households have seen more stable travel behaviour.
- Lower income households in Germany see a high level of variability, and difference, whereas in the USA and Victoria, it does differ, but not to such a large extent.

Overall, this has shown that in the various countries, there has been more stability in German travel behaviour, with the USA and Victoria seeing greater differences.

Limitations

- The condensation of variables was not perfectly aligned. Finding an exact match between the three datasets was not always feasible or appropriate. The most appropriate selection was made. However, there would be some overlaps. Examples include education level and household location.
- German MOP data has a small sample size annually, and this exercise may have been better undertaken using MiD data.
- In the USA, aggregate VMT per capita is relatively stable compared to what was observed in the NHTS data. This may reflect the NHTS data being more accurate or inaccurate; theories have been considered both ways.
- In Victoria, data is only available from 2007 onwards, with the 2007 and 2009 surveys being undertaken in a different style to the surveys later on, potentially resulting in some bias in the results (household income was not collected, along with other information requiring greater levels of assumptions when condensing the variables).