A glimpse into daily travel patterns
(from the Belgian National Travel Survey)

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Why study travel behaviour?

- daily trips involve many minor decisions. . .

- . . . but their aggregate effect is enormous

but also because it is interesting from a sociological viewpoint

Impacts of travel behaviour on society

- planning and maintaining the transportation system
- significant part of public spending at government level
- part of welfare and social policies
- land use regulations and policies (urban sprawl, . . .)
- human health and safety concerns

Impacts of travel behaviour on society (cont'd)

- many environmental issues:
  - pollution by exhaust gas (greenhouse effect)
  - major effect on water management in urban settings
  - landscape preservation
- legal and ethical questions (responsabilities, right to travel)
- ...

What do we mean by “daily travel behaviour”?

Motivating assumption:

trips are caused by the desire of individuals to participate in activities that take place in different locations

We are interested in:

the daily organization (succession, timing) of an individual’s activities and the details of his/her trips to these activities’ locations

(activity chains/patterns)

Some difficulties in studying daily travel behaviour

- very disaggregate
- suitable technology (GPS, . . .) not yet there
- very serious privacy issues
- specific survey techniques

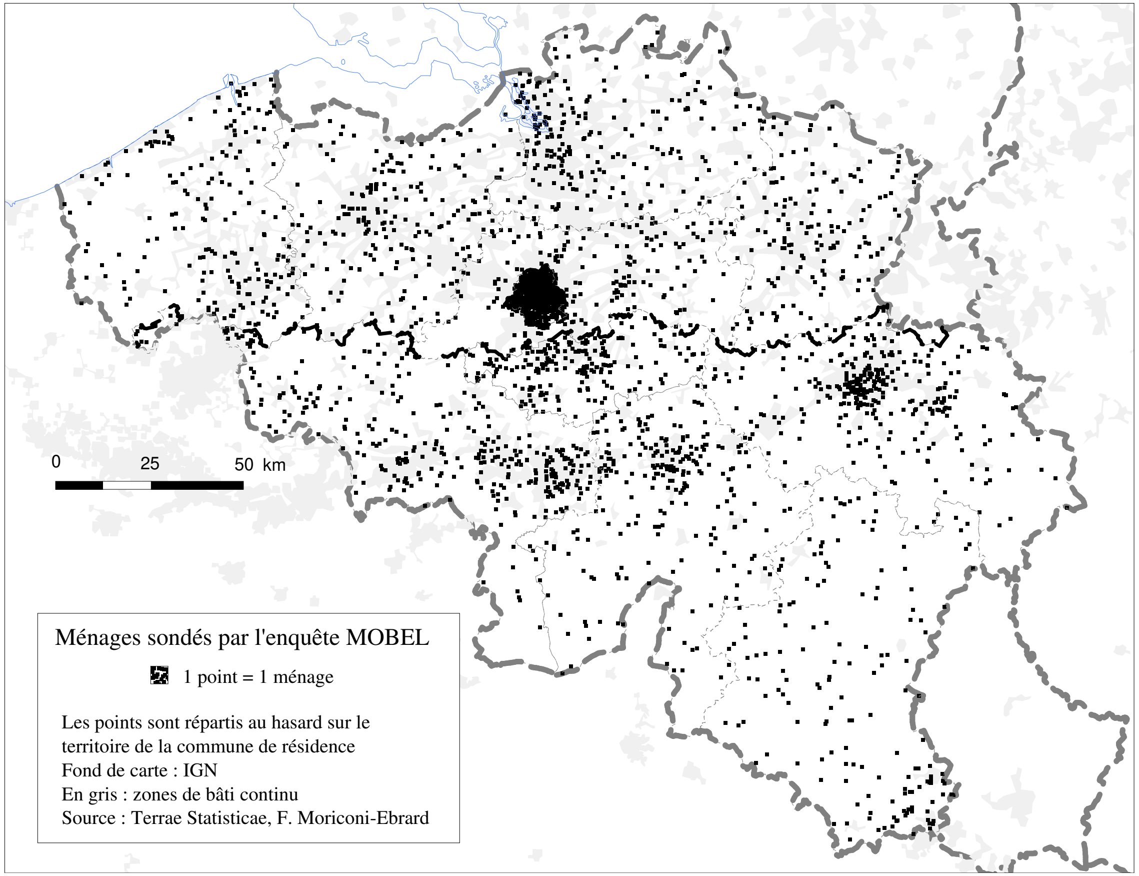
Issues for travel behaviour surveys

- sampling method (universe, stratification, size, . . .)
- protocol design
  - face-to-face vs. phone vs. mailback
  - prospective vs. retrospective
  - individual vs. household
  - activity vs. trip based organization
  - week days vs. all days
- financing!

The Belgian National Travel Survey (MOBEL)

- all Belgian residents aged 6 and above
- 3064 households = 7037 individuals
- 365 days, every day, one day retrospective
- mailback + phone support
- trip based questionnaire
- response rate 43%

The sample geographical distribution



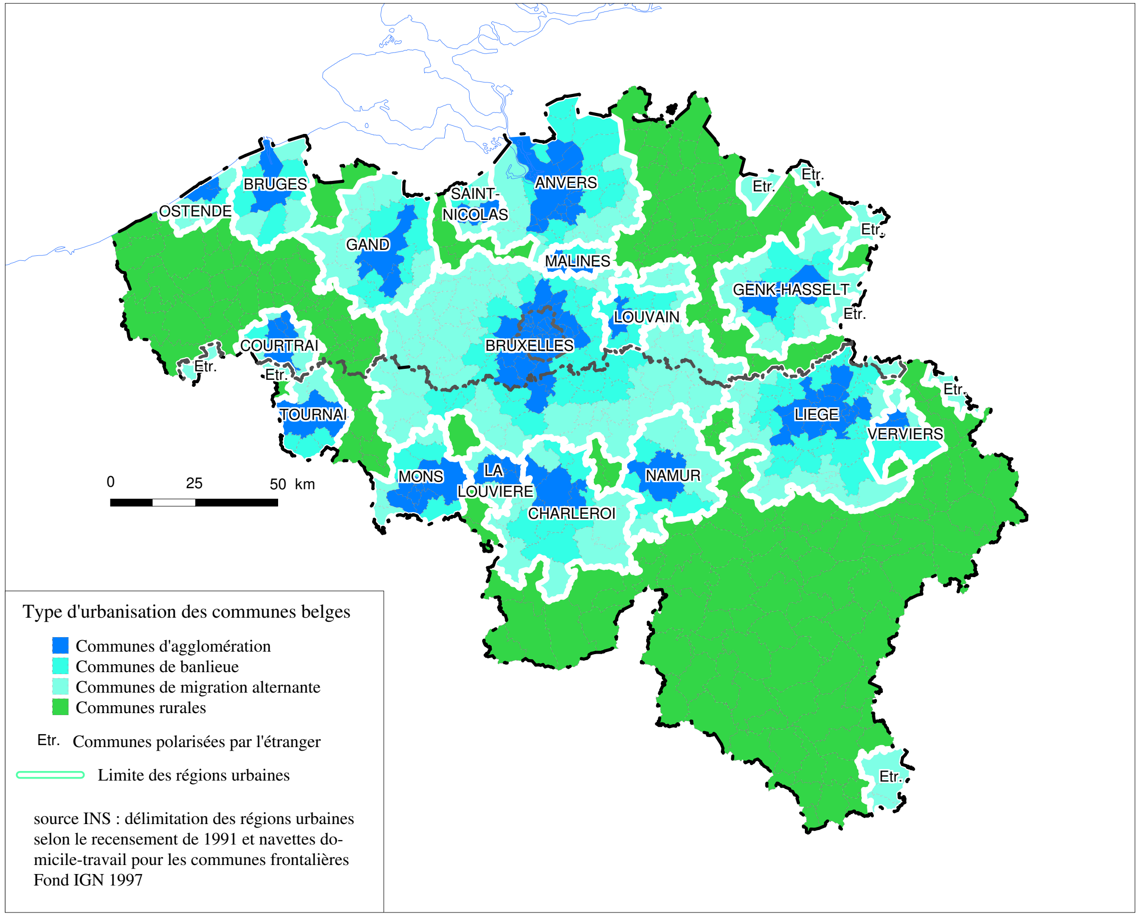
Geographical distribution of the MOBEL sampled households

ex: J.P. Hubert, Ph. Toint, “La mobilité quotidienne des Belges”, P. U. Namur, 2002.

A few facts about Belgium...

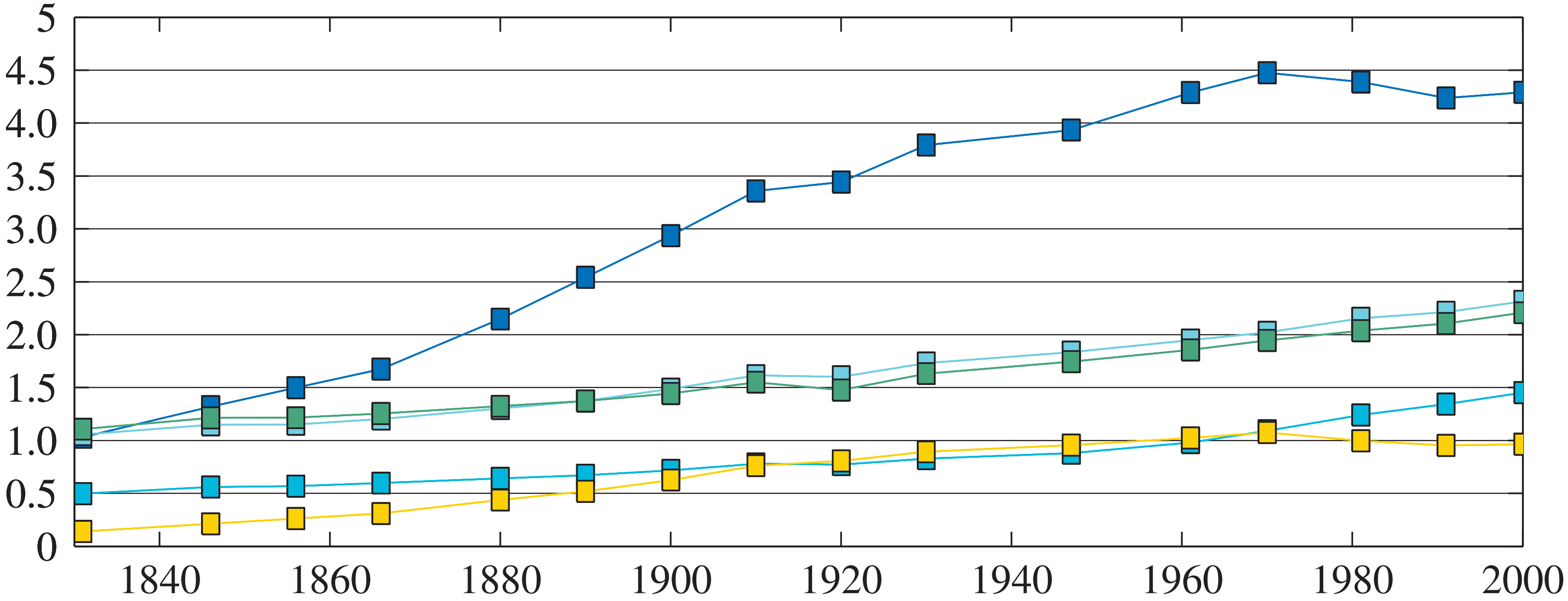
- 3 Regions (Flanders, Brussels, Wallonie)
- $\approx$ 10 millions people
- (essentially) 2 languages: dutch + french
- 10 provinces
- longest straight line $\approx$ 300 km

Land use in Belgium



Residence types: city, suburbs, migratory and rural zones

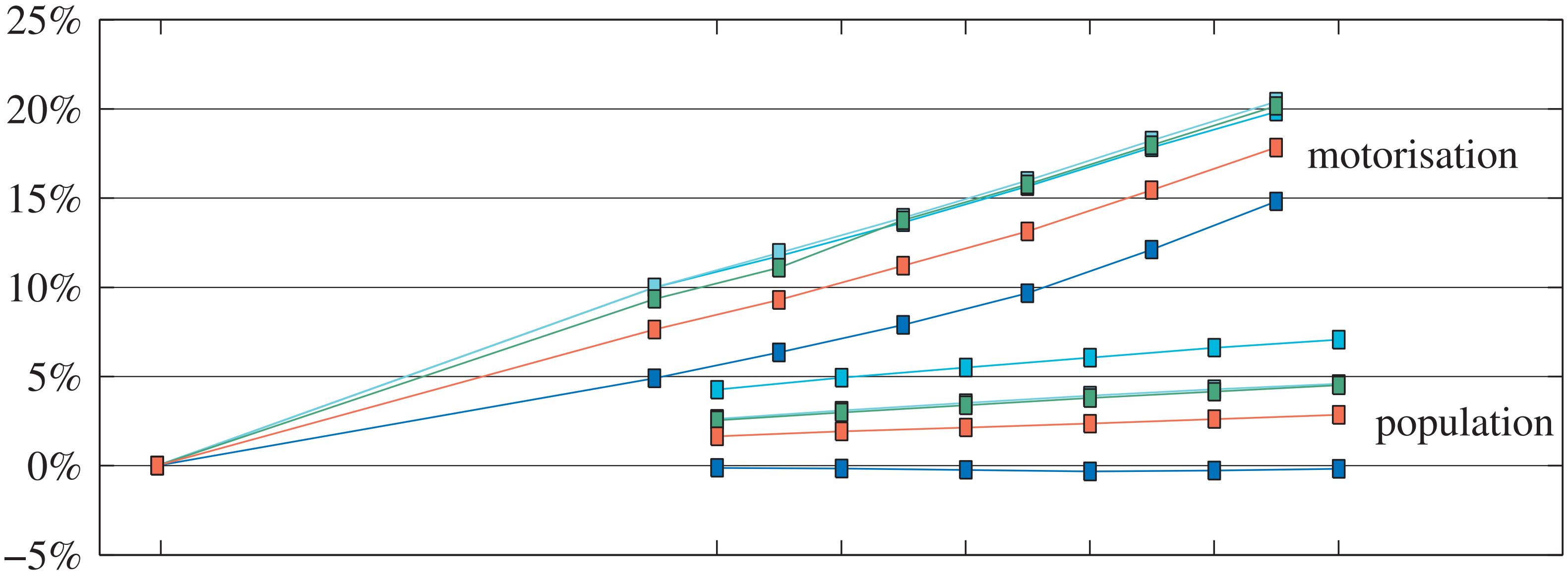
Some interesting evolutions (1)



Evolution of the Belgian population since 1831
according to residence type in 1991 (source INS)

ex: J.P. Hubert, Ph. Toint, "La mobilité quotidienne des Belges", P. U. Namur, 2002.

Some interesting evolutions (2)



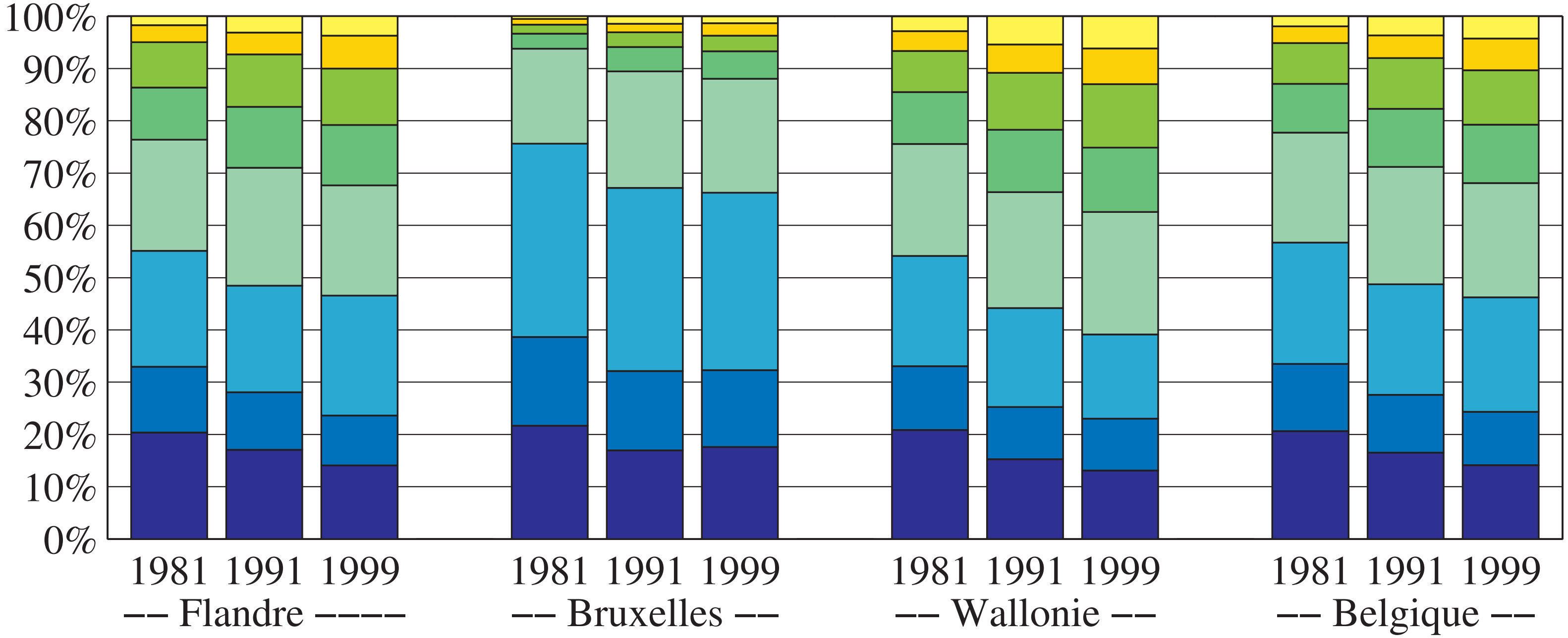
Evolution of the population and motorisation according to residence type (source DIV, INS)

Rural Migratory Suburb

City Brussels

ex: J.P. Hubert, Ph. Toint, "La mobilité quotidienne des Belges", P. U. Namur, 2002.

Some interesting evolutions (3)

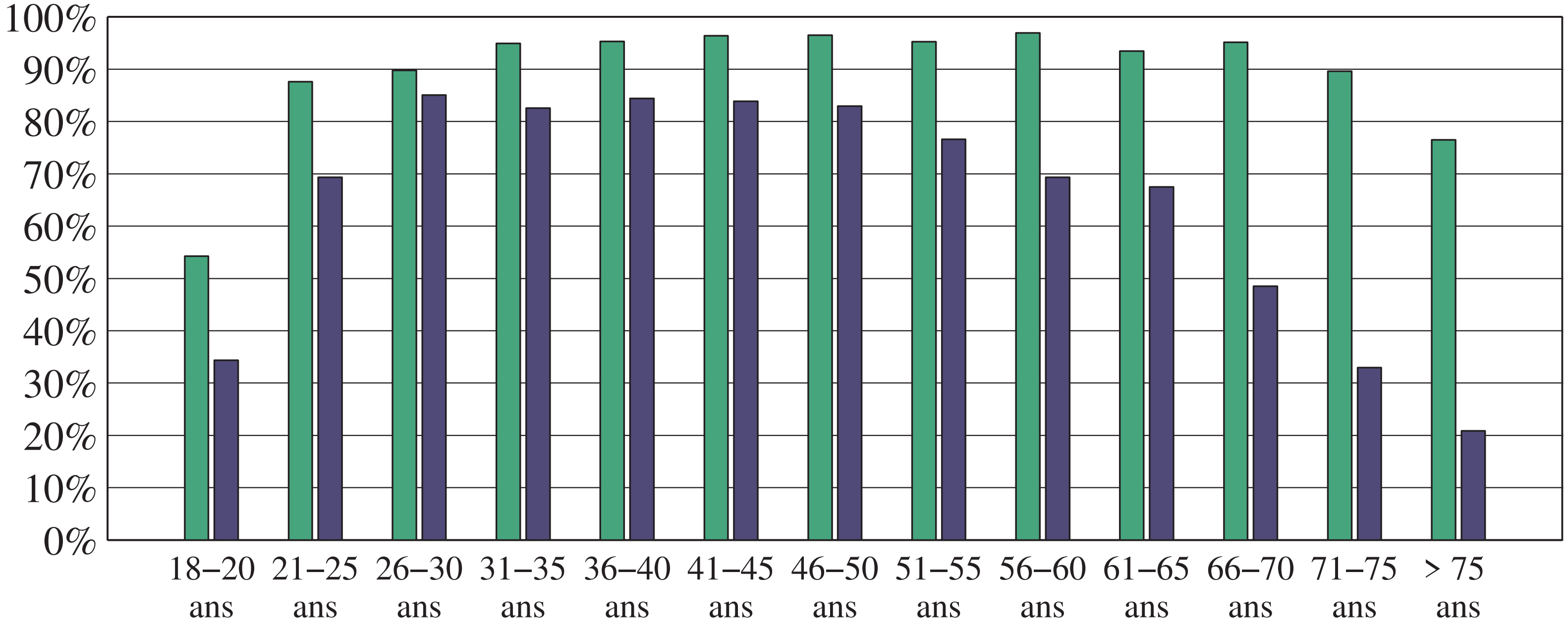


Evolution of the distribution of distance to work according to residence type between 1970 and 1999

$<$ 3 km | 3–4 km | 5–9 km | 10–19 km
20–29 km | 30–49 km | 50–69 km | $\geq$ 70 km

ex: J.P. Hubert, Ph. Toint, "La mobilité quotidienne des Belges", P. U. Namur, 2002.

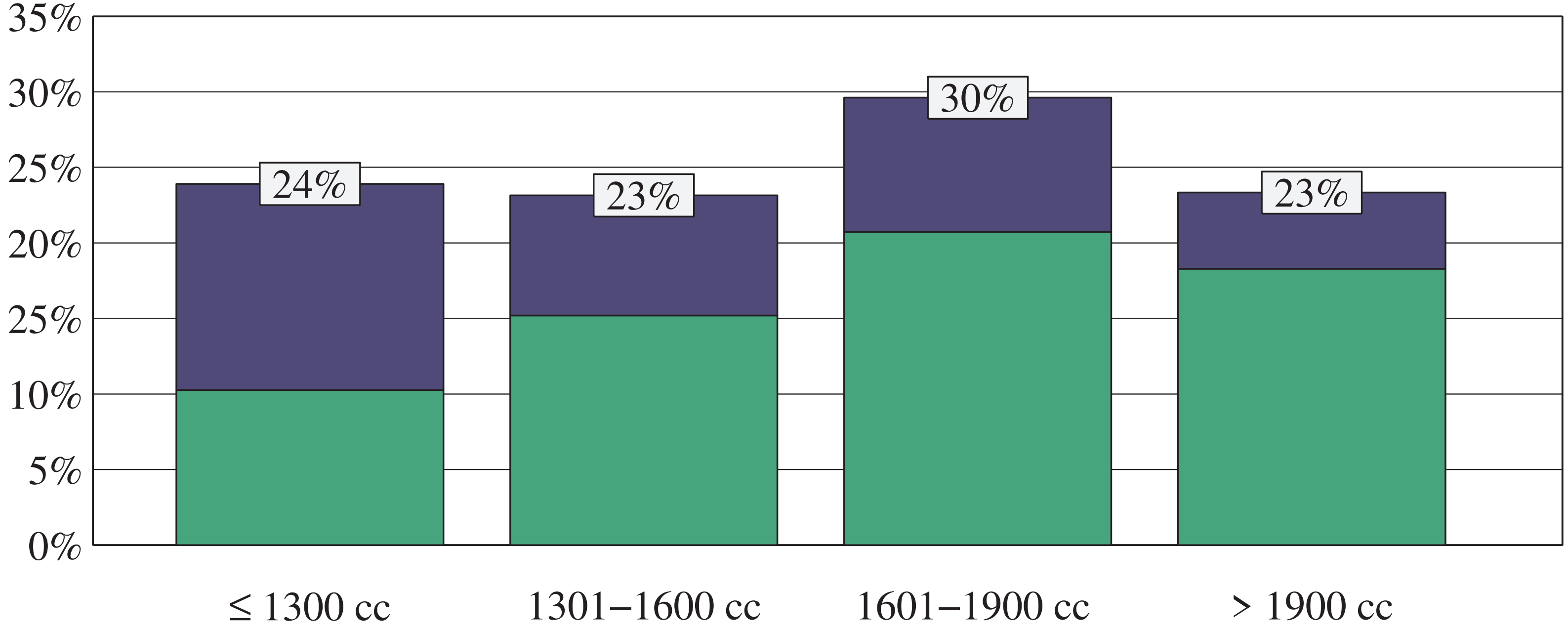
Driving license, sex and age



Part of the population with a driving licence according to age and sex

ex: J.P. Hubert, Ph. Toint, “La mobilité quotidienne des Belges”, P. U. Namur, 2002.

What type of car are you driving?

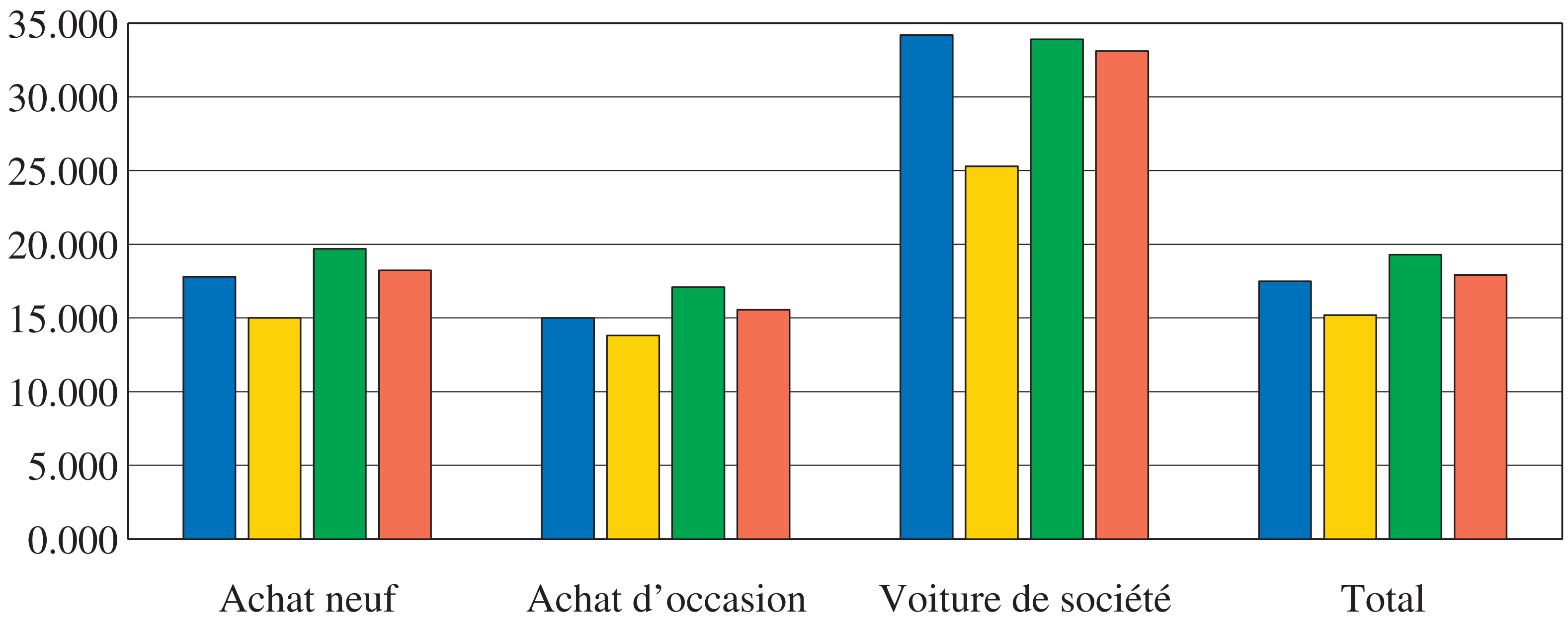


Household cars according to engine size and sex of their main user

Male Female

ex: J.P. Hubert, Ph. Toint, “La mobilité quotidienne des Belges”, P. U. Namur, 2002.

What cars are used most?

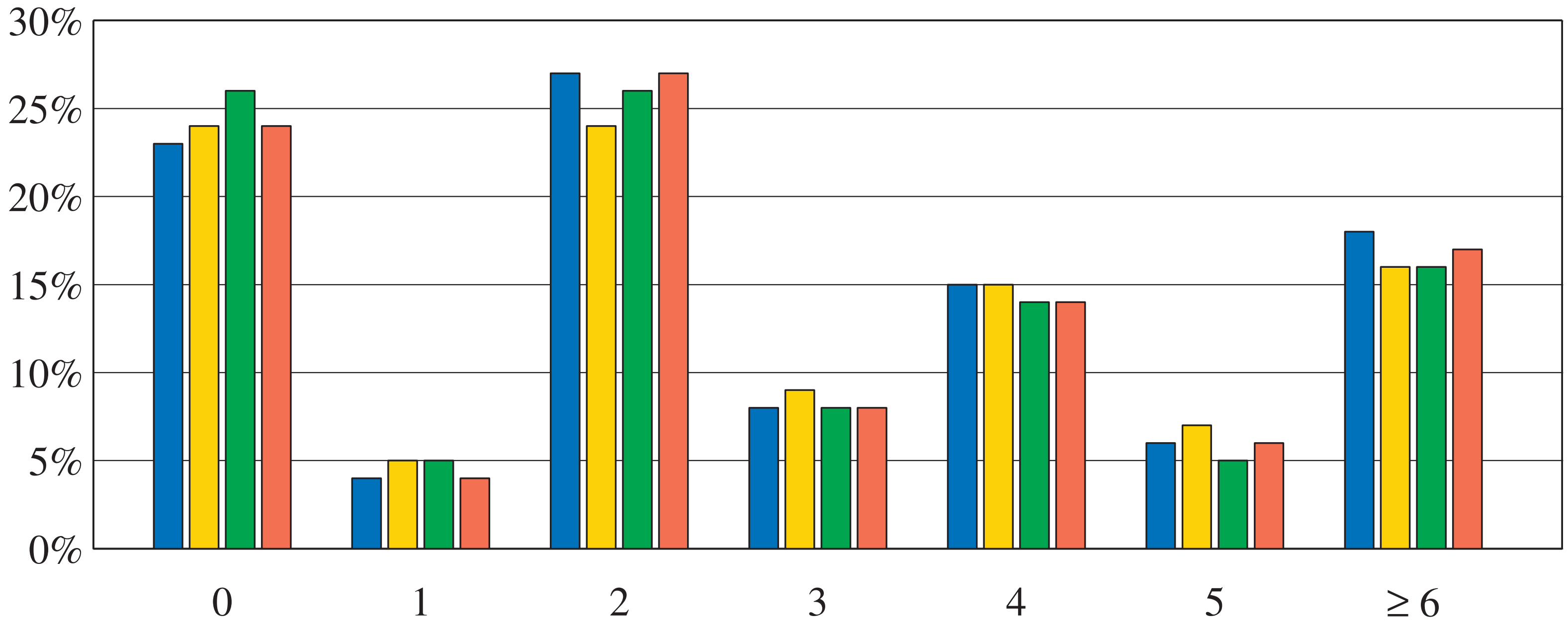


Yearly use of car according to their mode of acquisition and Region

Flanders   Brussels   Wallonie   Belgium

ex: J.P. Hubert, Ph. Toint, "La mobilité quotidienne des Belges", P. U. Namur, 2002.

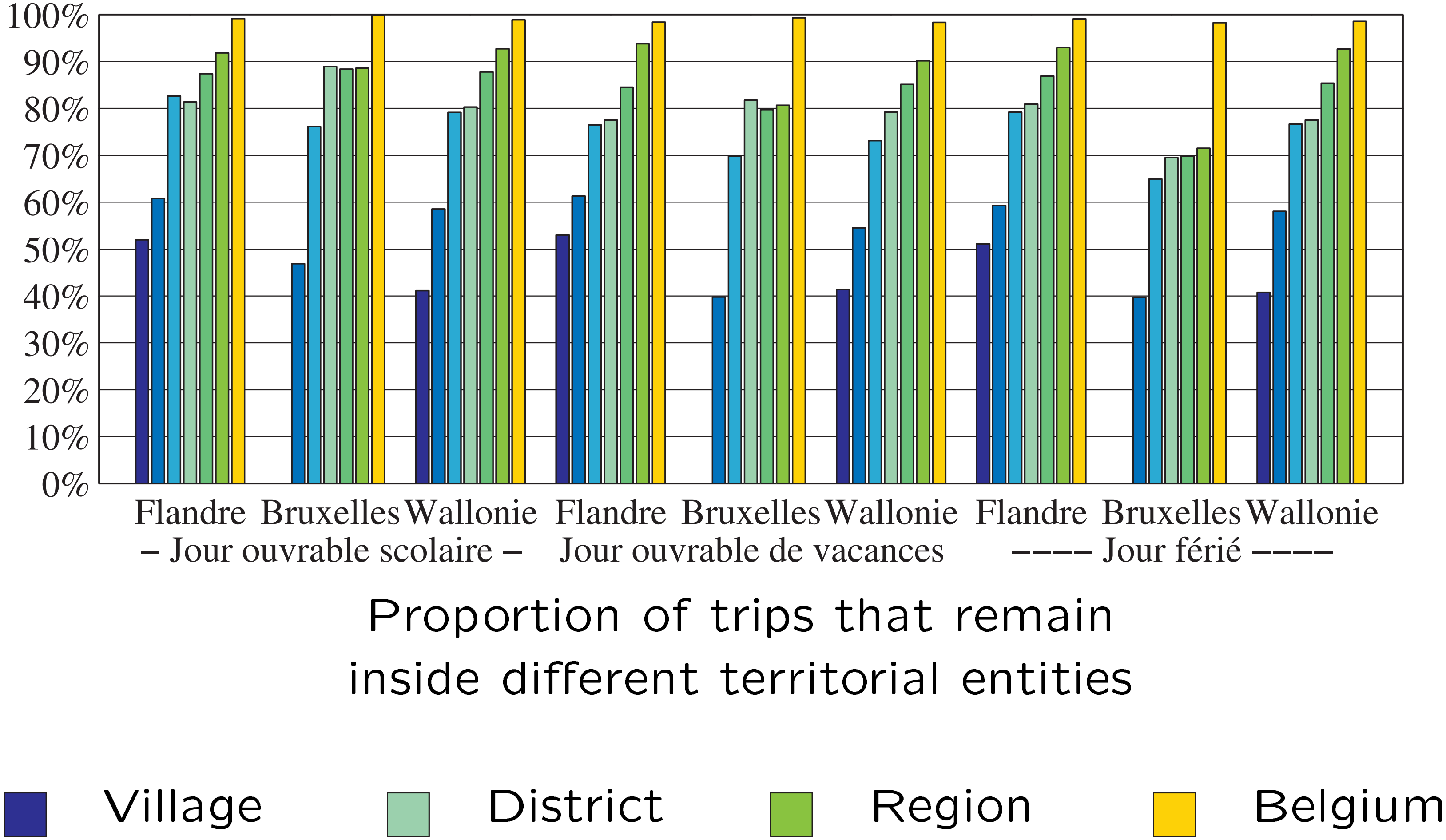
How many trips per day?



Proportion of individuals according to their number of daily trips

ex: J.P. Hubert, Ph. Toint, “La mobilité quotidienne des Belges”, P. U. Namur, 2002.

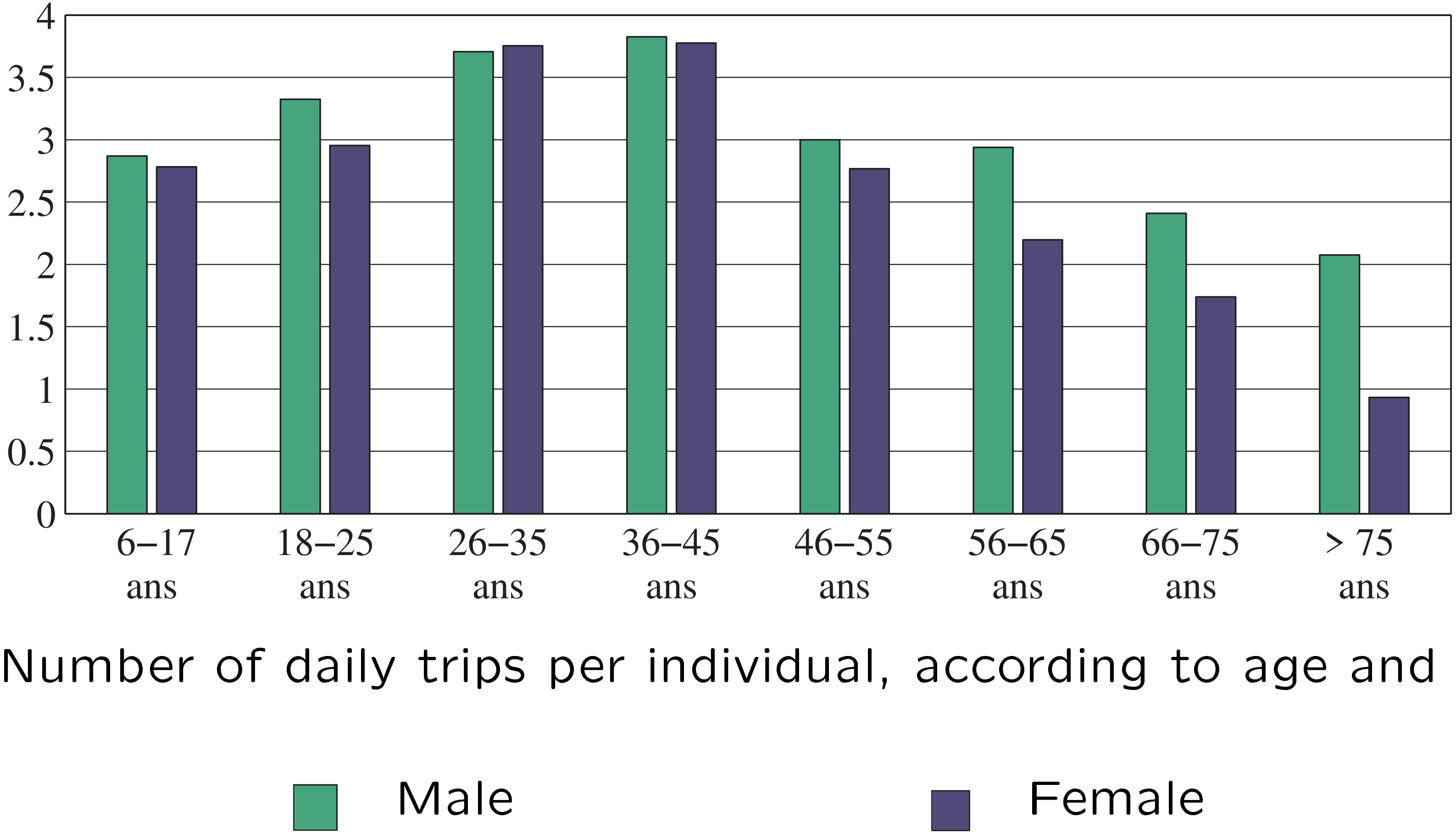
How local are daily trips?



Proportion of trips that remain inside different territorial entities

ex: J.P. Hubert, Ph. Toint, "La mobilité quotidienne des Belges", P. U. Namur, 2002.

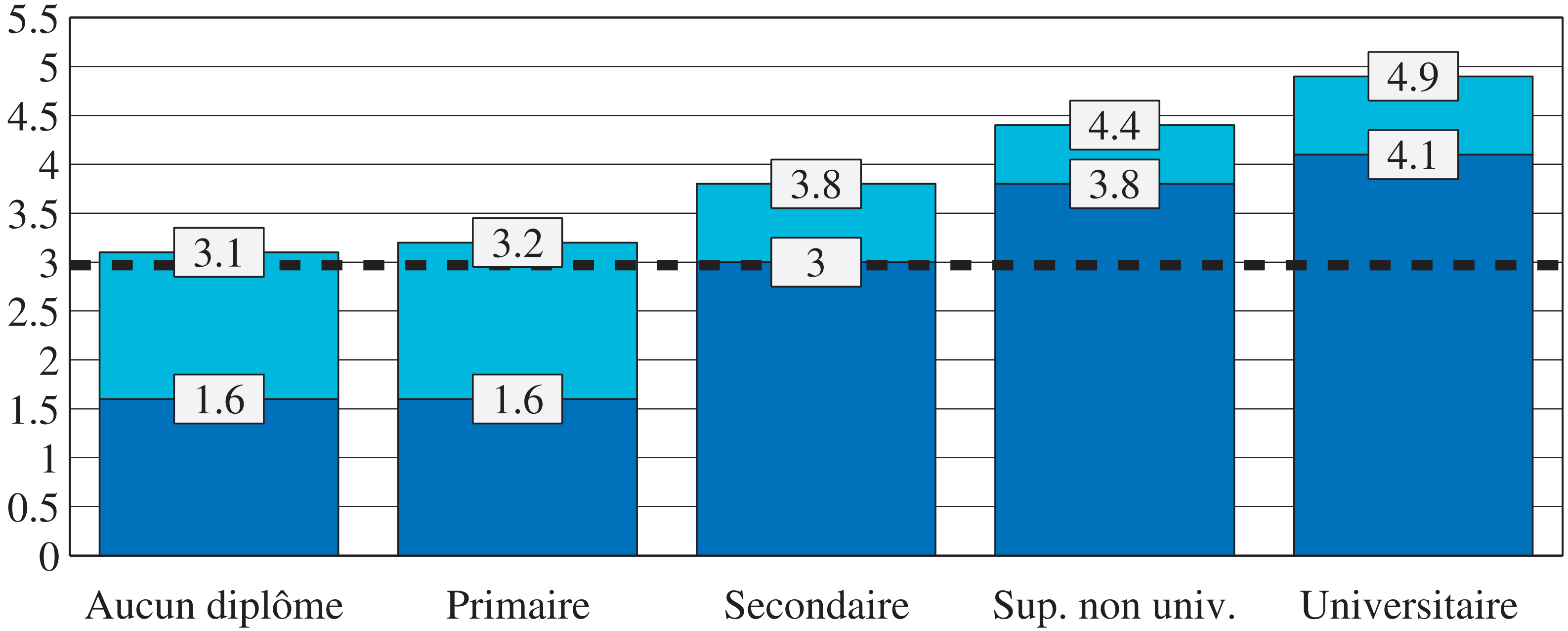
How does mobility vary with age?



Number of daily trips per individual, according to age and sex

ex: J.P. Hubert, Ph. Toint, "La mobilité quotidienne des Belges", P. U. Namur, 2002.

How does mobility vary with education level?

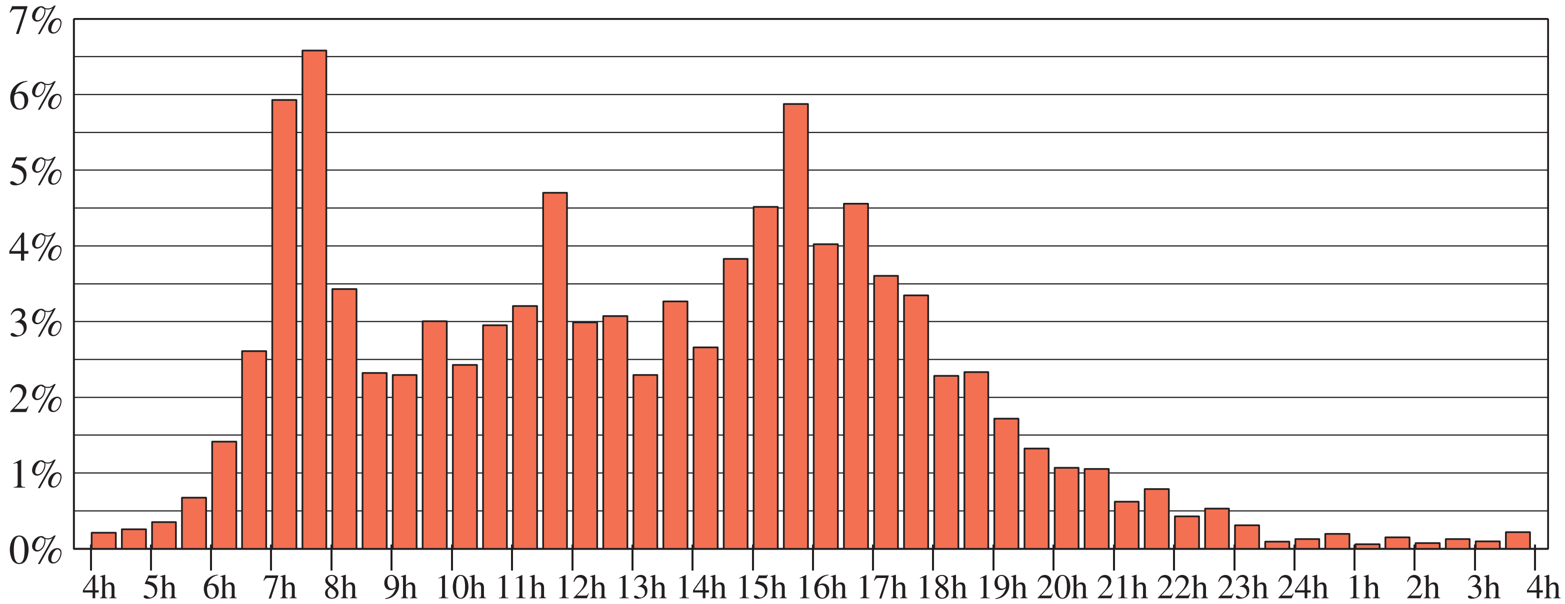


Number of daily trips per individual,
according to highest degree obtained

Including immobiles   Excluding immobiles

ex: J.P. Hubert, Ph. Toint, "La mobilité quotidienne des Belges", P. U. Namur, 2002.

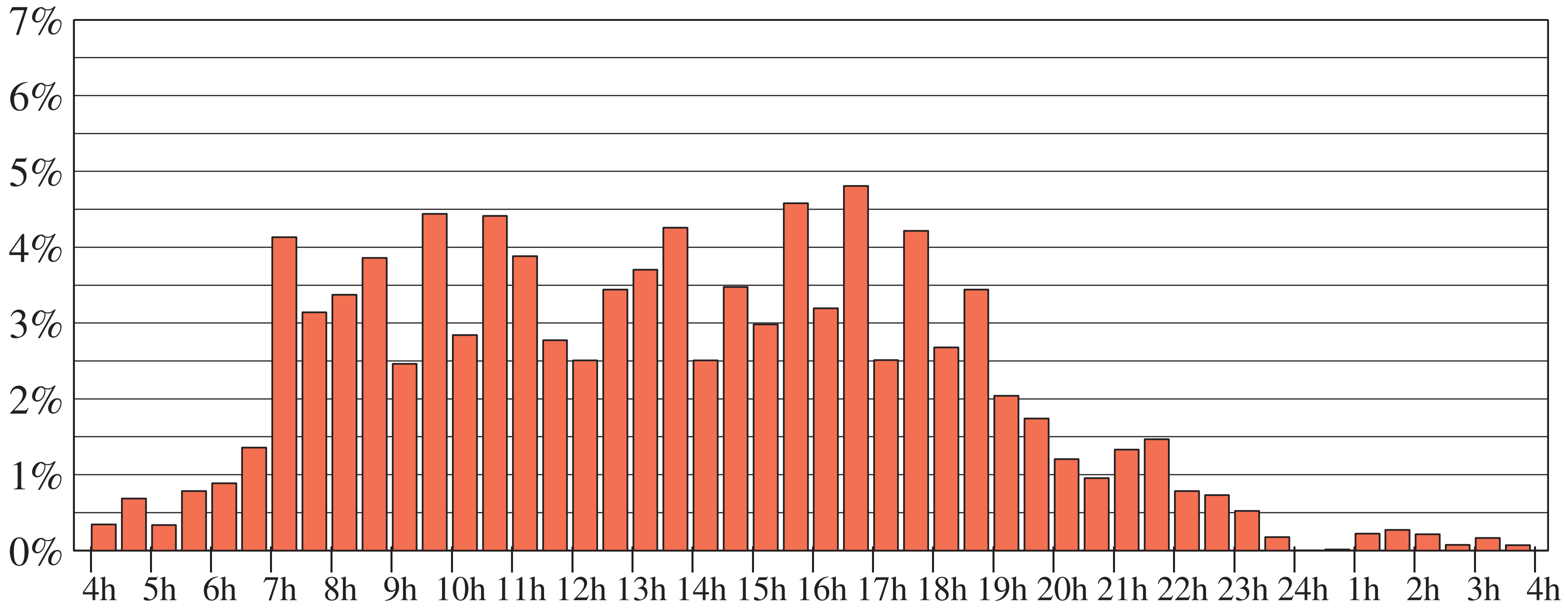
How does departure time vary for work-school days?



Distribution of trips on a work-school day
according to departure time

ex: J.P. Hubert, Ph. Toint, "La mobilité quotidienne des Belges", P. U. Namur, 2002.

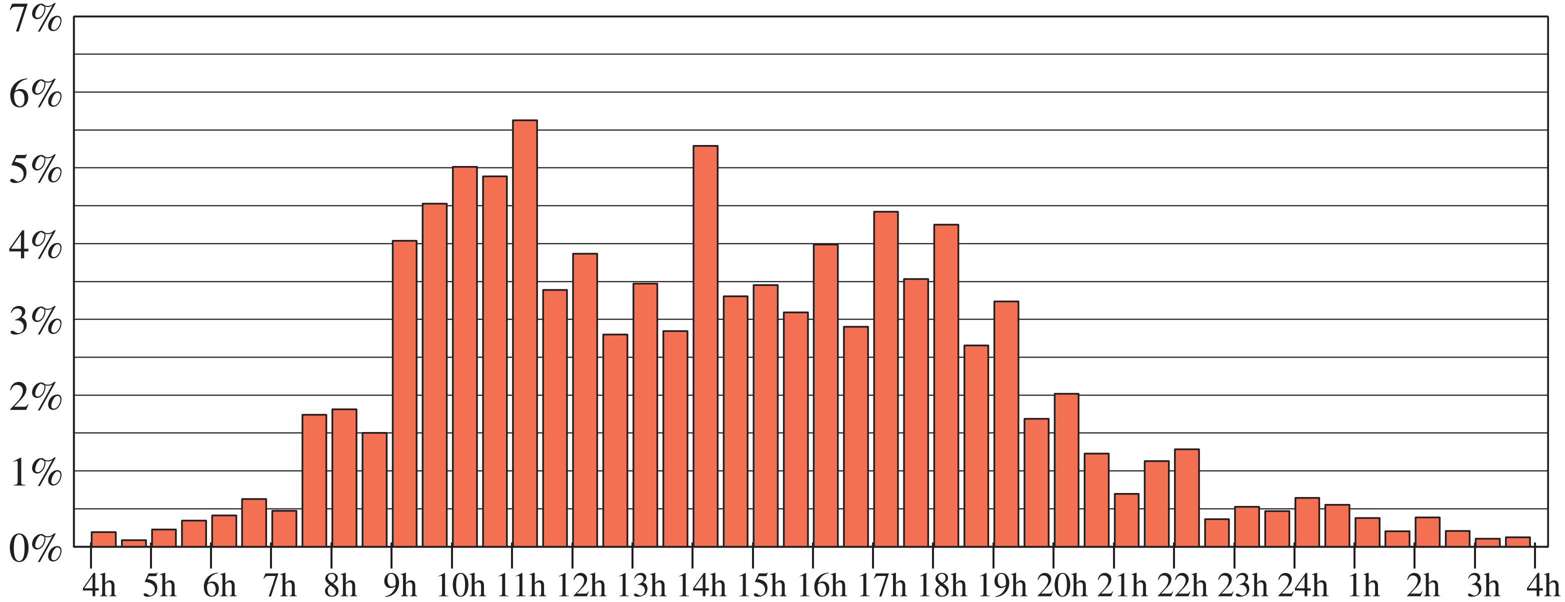
How does departure time vary for work-NONschool days?



Distribution of trips on a work day during school holidays, according to departure time

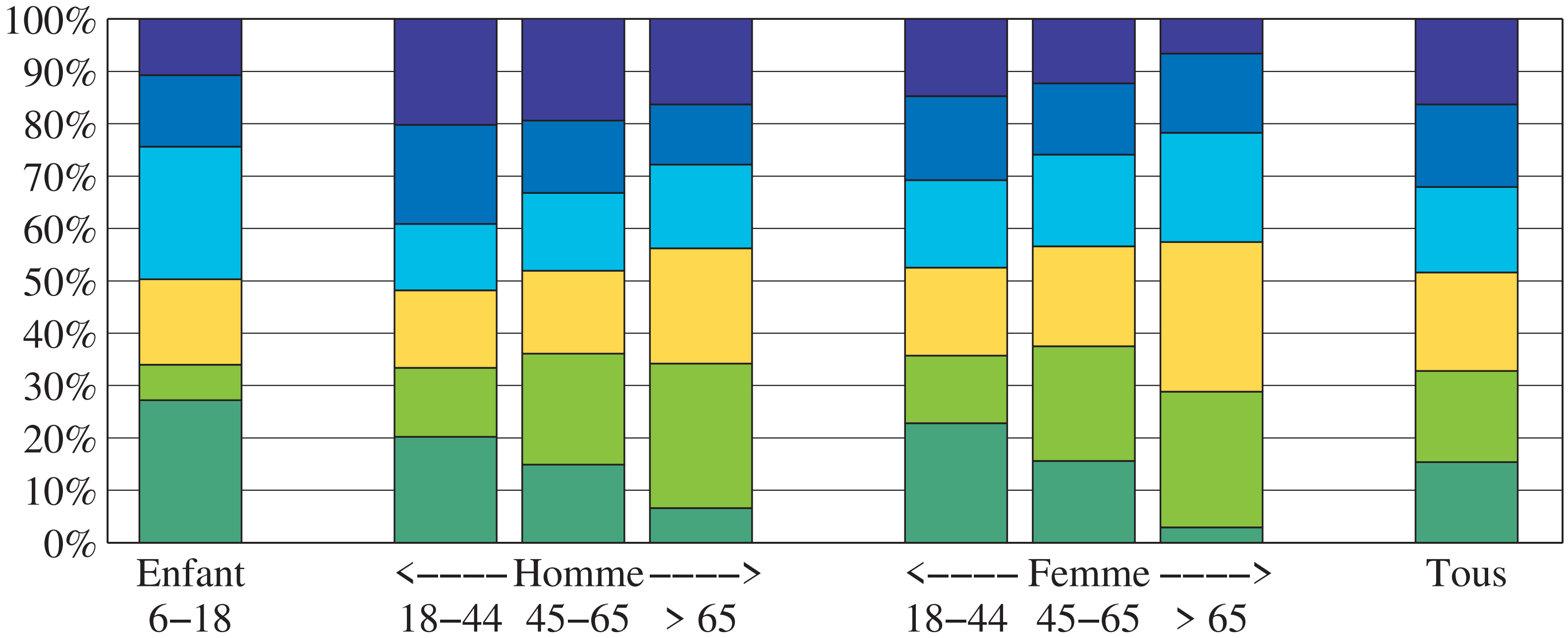
ex: J.P. Hubert, Ph. Toint, “La mobilité quotidienne des Belges”, P. U. Namur, 2002.

How does departure time vary for holiday days?



Distribution of trips on a work day during public holidays and WE, according to departure time

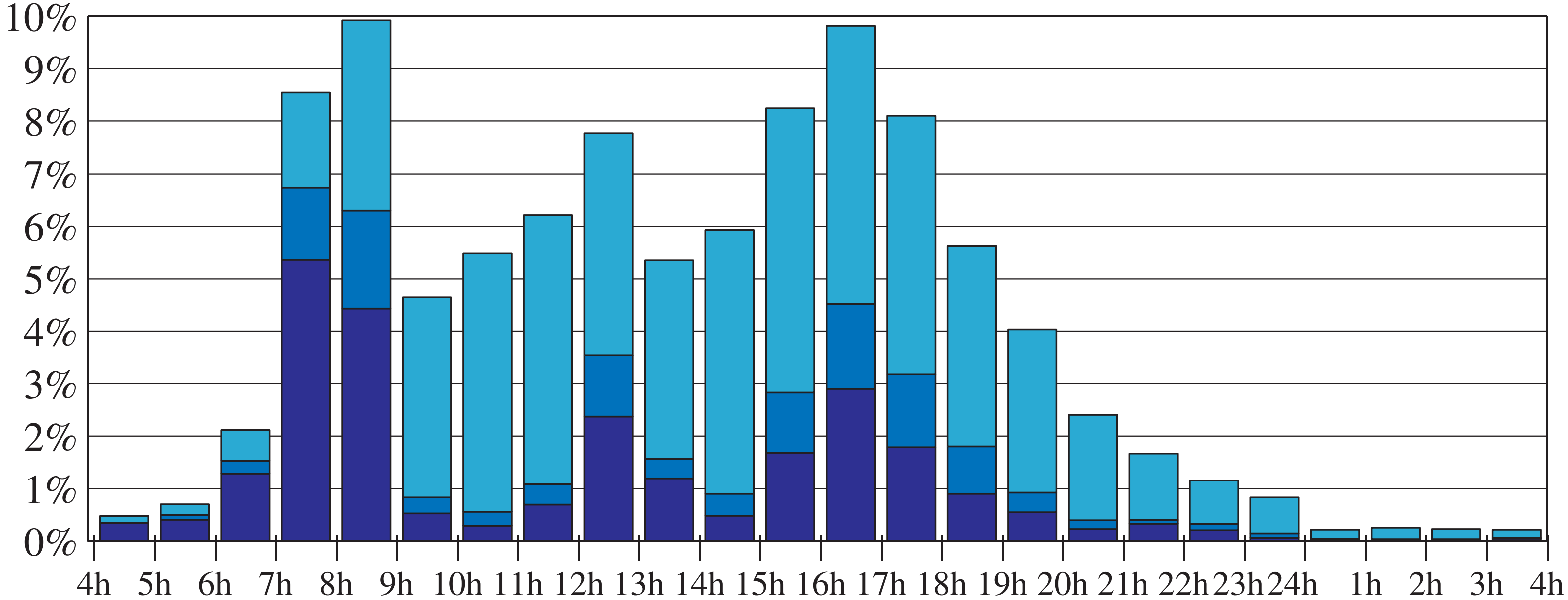
Who suffers from congestion?



Distribution of time spent in congestion on an average day, according to sex and age

ex: J.P. Hubert, Ph. Toint, "La mobilité quotidienne des Belges", P. U. Namur, 2002.

What travel purposes are causing congestion?

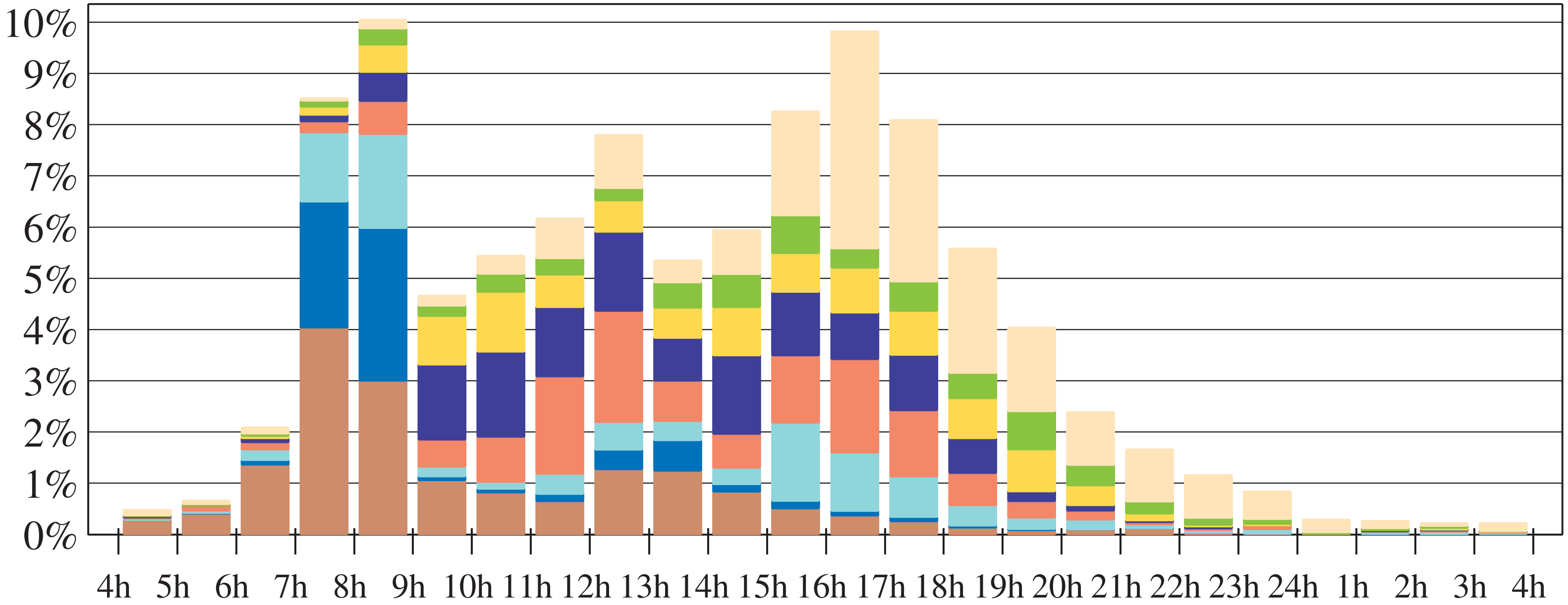


Distribution of departure times for work/school
and other purposes on an average work-school day

W + S direct W + S indirect Other

ex: J.P. Hubert, Ph. Toint, "La mobilité quotidienne des Belges", P. U. Namur, 2002.

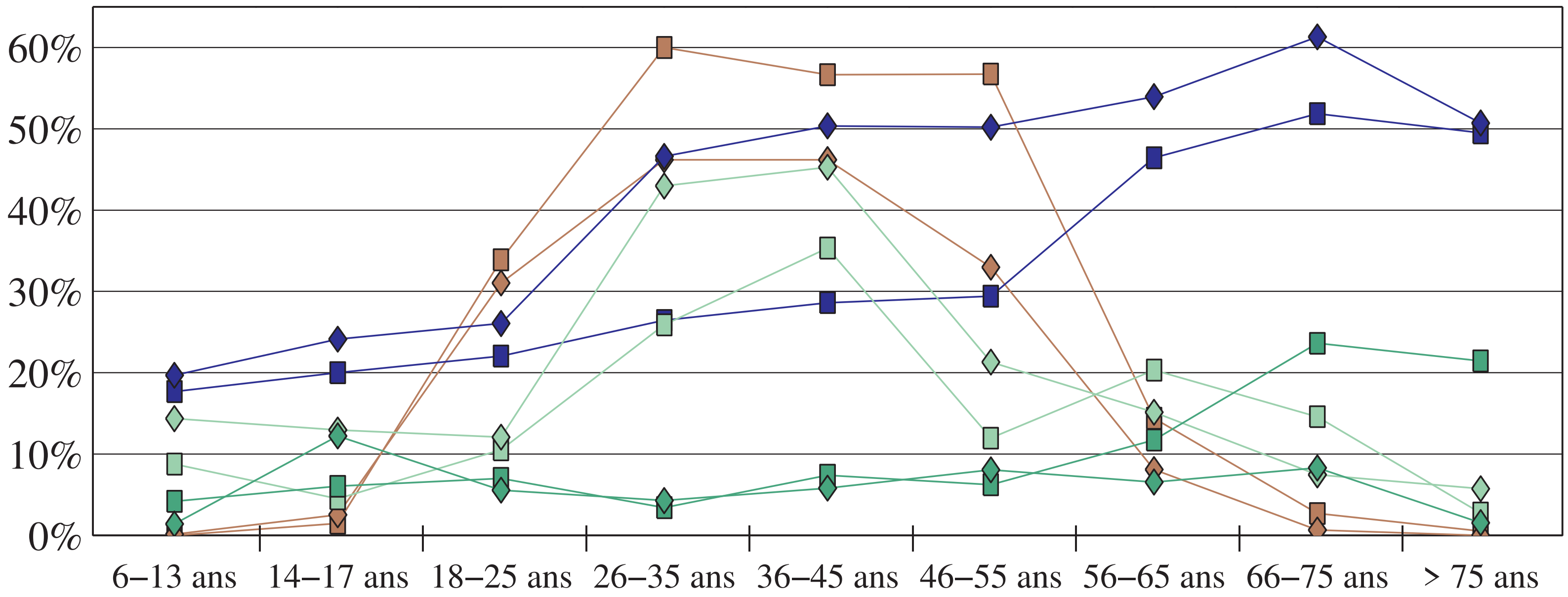
What travel purposes at what time?



Distribution of travel purposes and departure times
on an average work-school day

ex: J.P. Hubert, Ph. Toint, “La mobilité quotidienne des Belges”, P. U. Namur, 2002.

What travel purposes at what age?

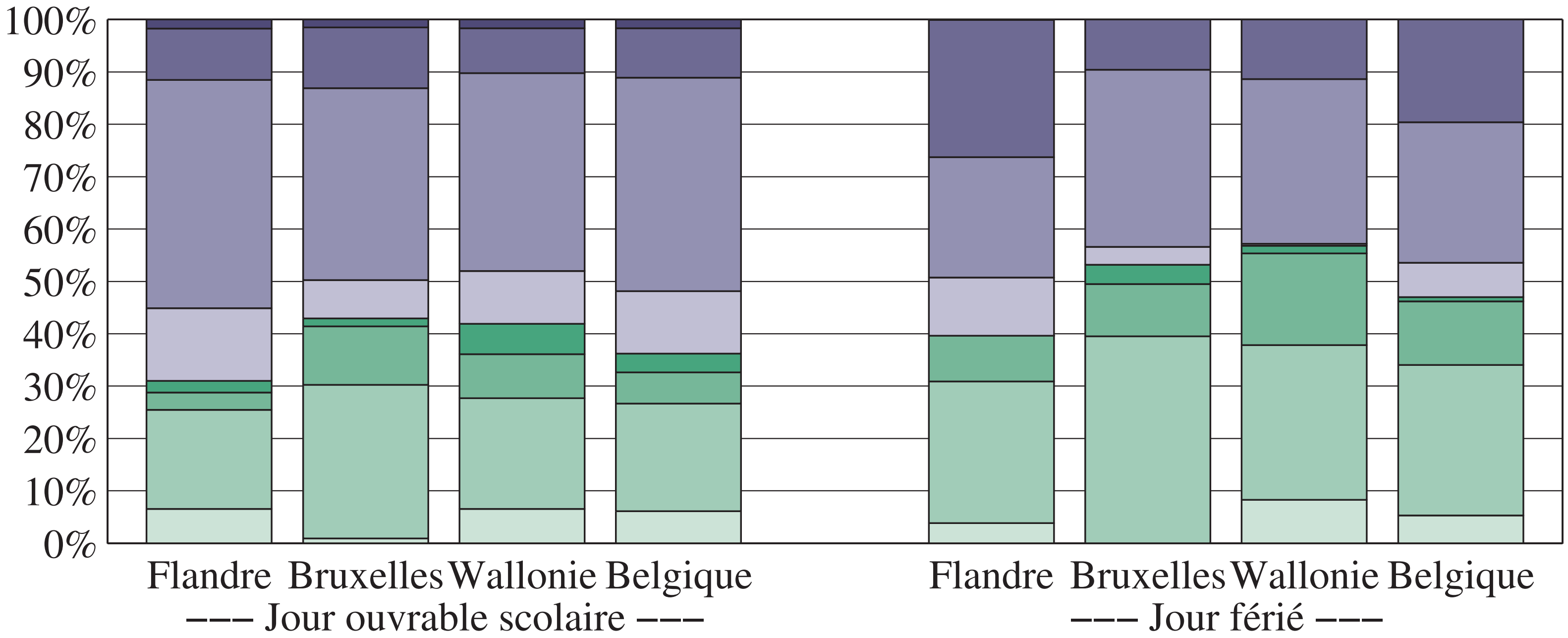


Distribution of travel purposes according to age and sex
on an average work-school day

Work	School	Taxi
Dash home	Shopping, resto	Perso, visits
Leisure	Return home	Other

ex: J.P. Hubert, Ph. Toint, "La mobilité quotidienne des Belges", P. U. Namur, 2002.

Who is driving everybody else around?

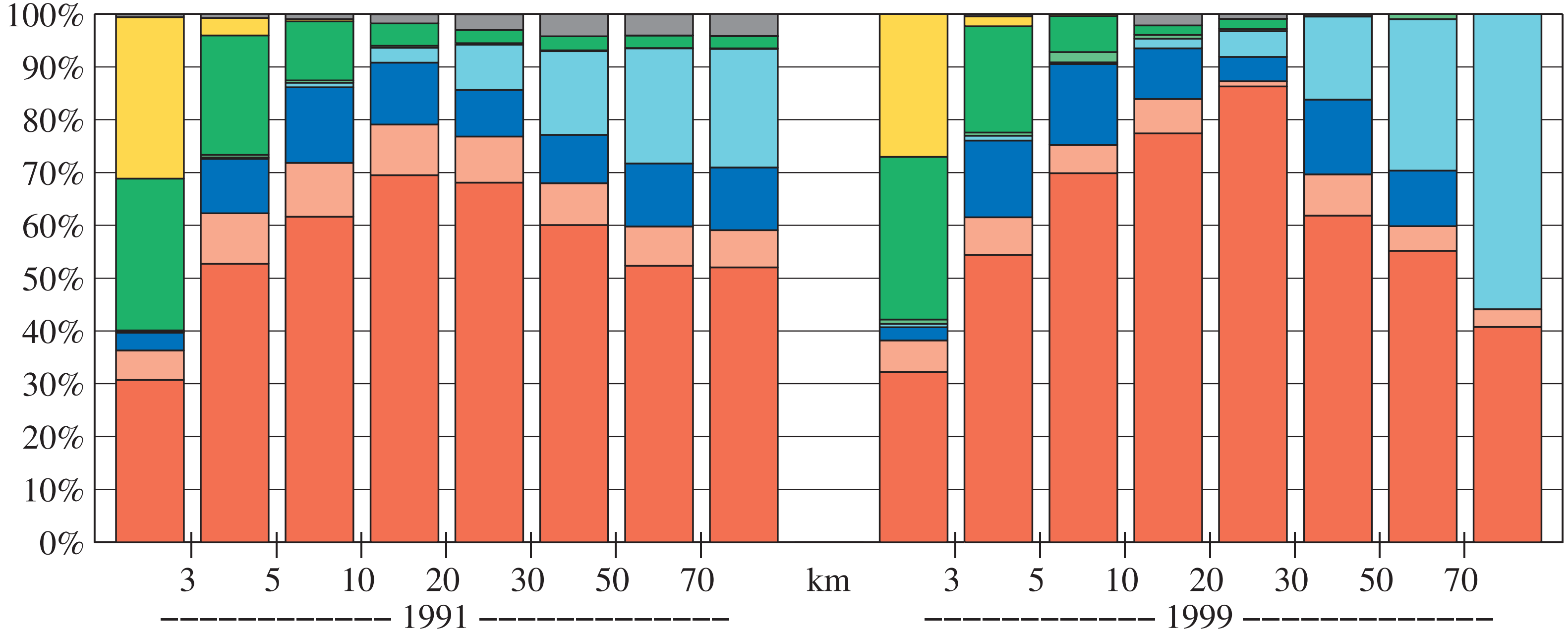


Distribution of age and sex of "taxi drivers" according to day type and Region

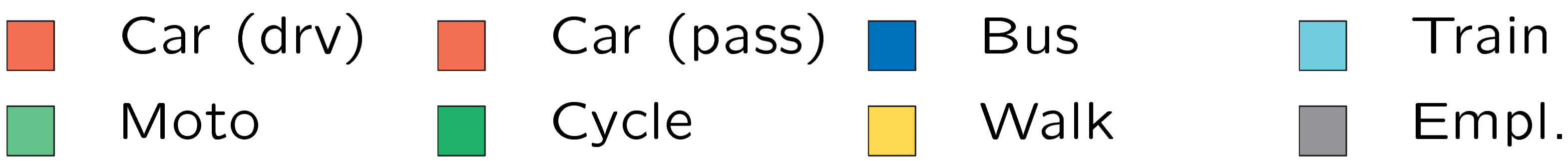
F < 25	F 25–44	F 45–64	F ≥ 65
M < 25	M 25–44	M 45–64	M ≥ 65

ex: J.P. Hubert, Ph. Toint, "La mobilité quotidienne des Belges", P. U. Namur, 2002.

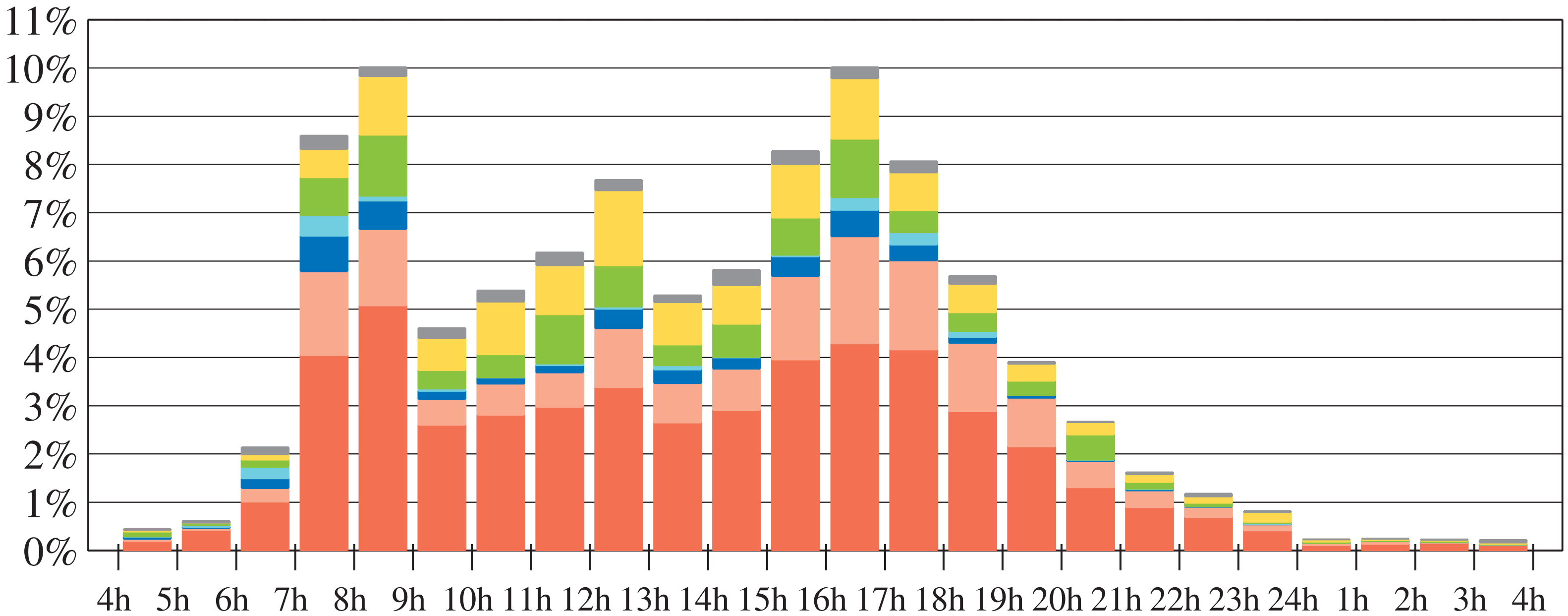
Evolution of travel mode to work



Evolution of work-trip modes according to distance



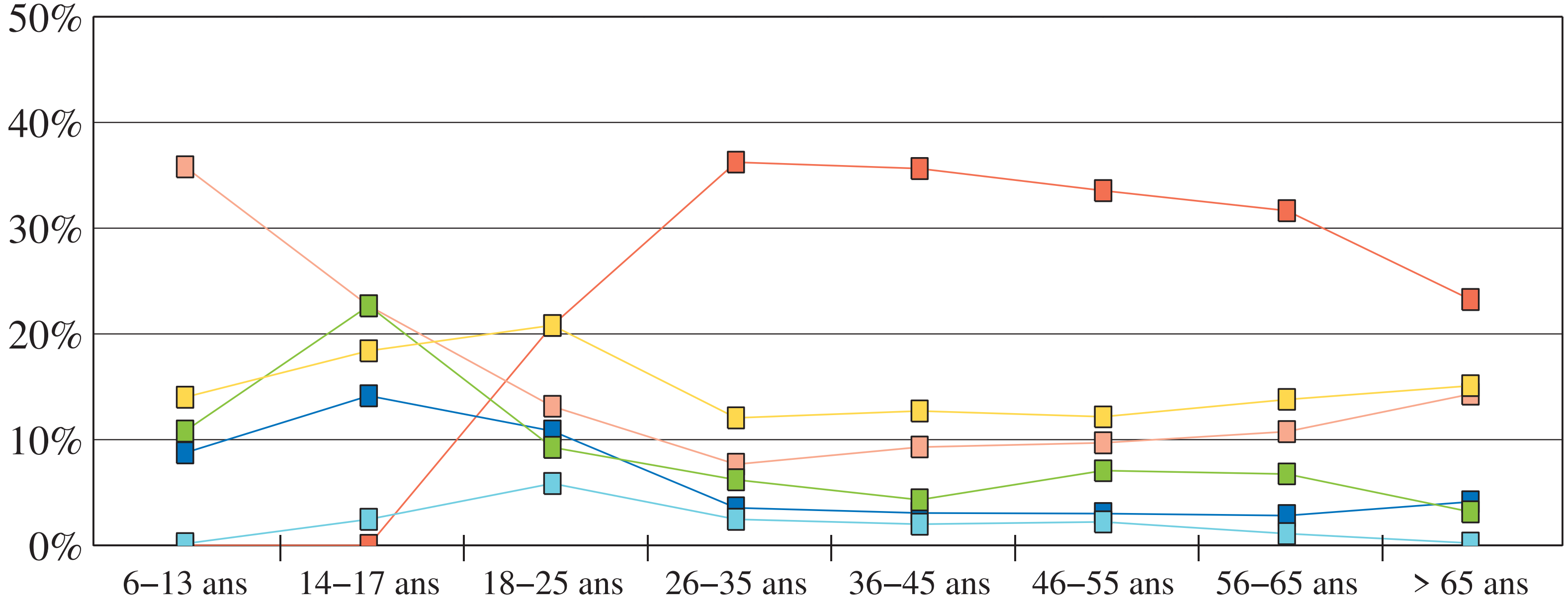
What travel mode at what time?



Distribution of daily trips according to principal mode and time, for a work-school day

ex: J.P. Hubert, Ph. Toint, "La mobilité quotidienne des Belges", P. U. Namur, 2002.

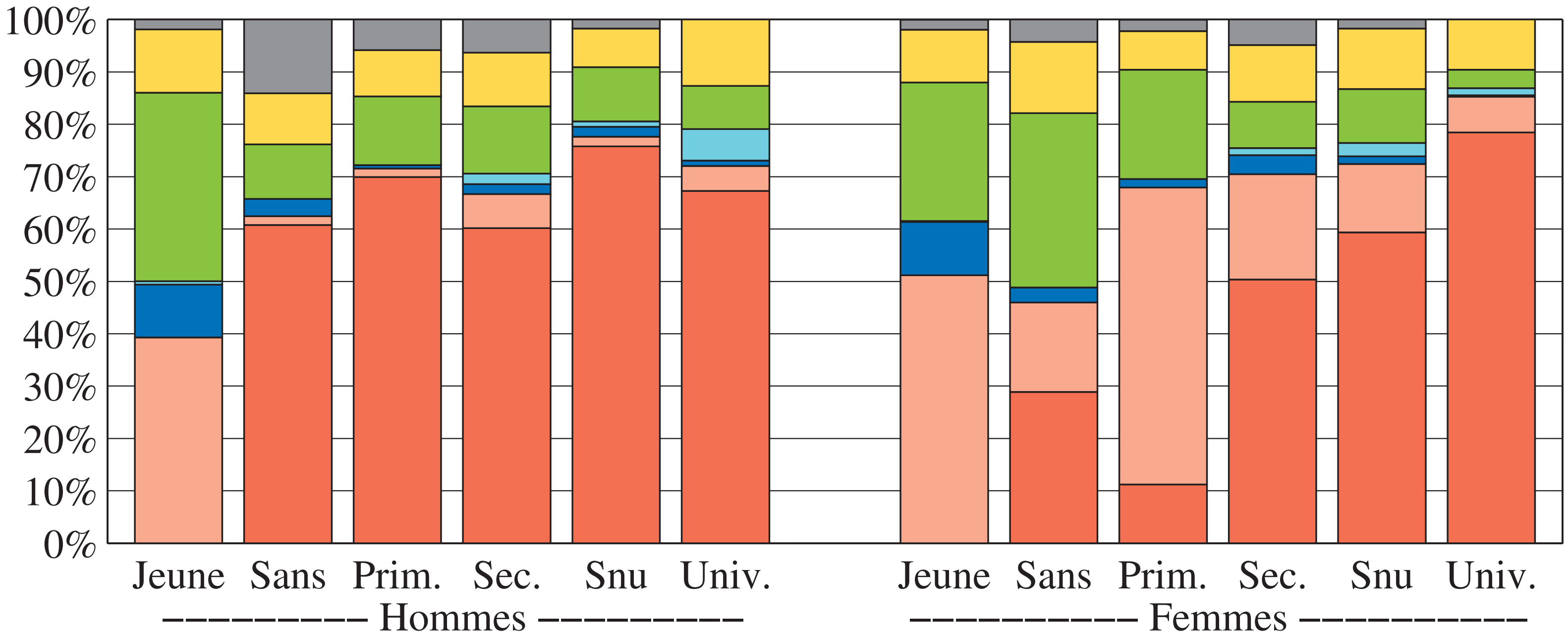
What travel mode at what age?



Distribution of modes according to age,
for a work-school day

ex: J.P. Hubert, Ph. Toint, "La mobilité quotidienne des Belges", P. U. Namur, 2002.

Travel mode and education level

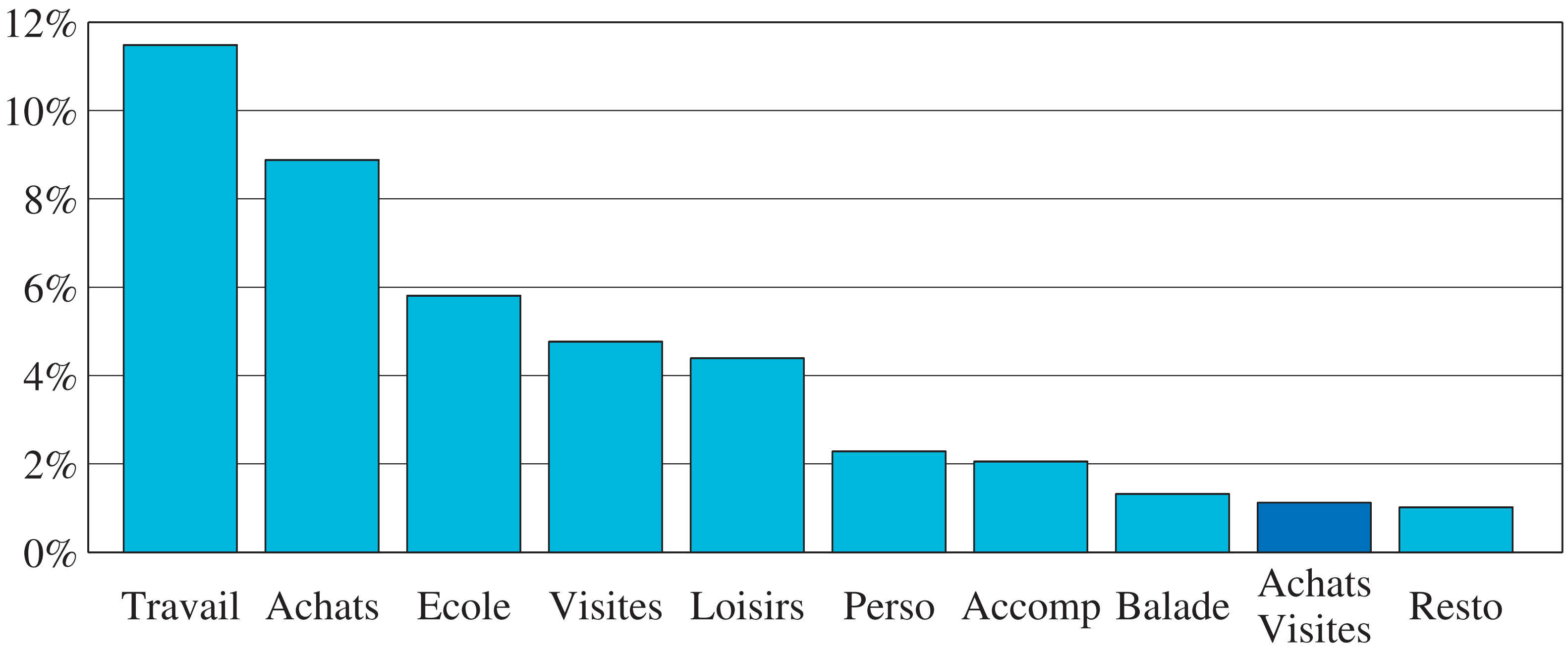


Distribution of modes according to highest degree obtained, for a work-school day in Flanders

Car (driver) Car (passenger) Bus
Train 2 wheels Walk

ex: J.P. Hubert, Ph. Toint, "La mobilité quotidienne des Belges", P. U. Namur, 2002.

How many different ways to organize ones's day?

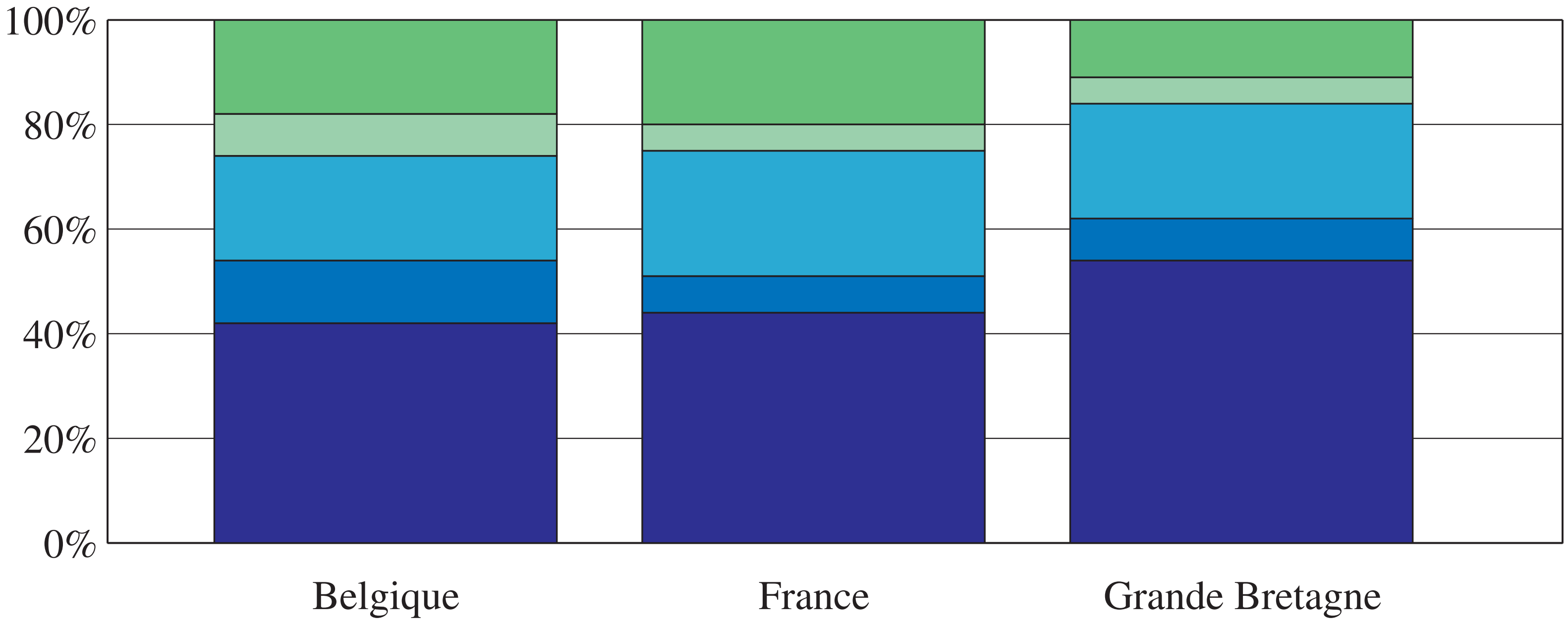


Frequency of the most popular daily activity chains

Home→A→home   Home→A→B→home

ex: J.P. Hubert, Ph. Toint, "La mobilité quotidienne des Belges", P. U. Namur, 2002.

An international comparison



Complexity of the daily activity chain in 3 European countries

ex: J.P. Hubert, Ph. Toint, “La mobilité quotidienne des Belges”, P. U. Namur, 2002.

A few conclusions

- crucial to organize transportation systems
- has had real impact on politics
- show interesting sociological/cultural issues
- allows international comparison

How about New-Zealand?

Thanks for your interest and attention.