Tourism modelling in the new Danish National Model – a multi-day approach

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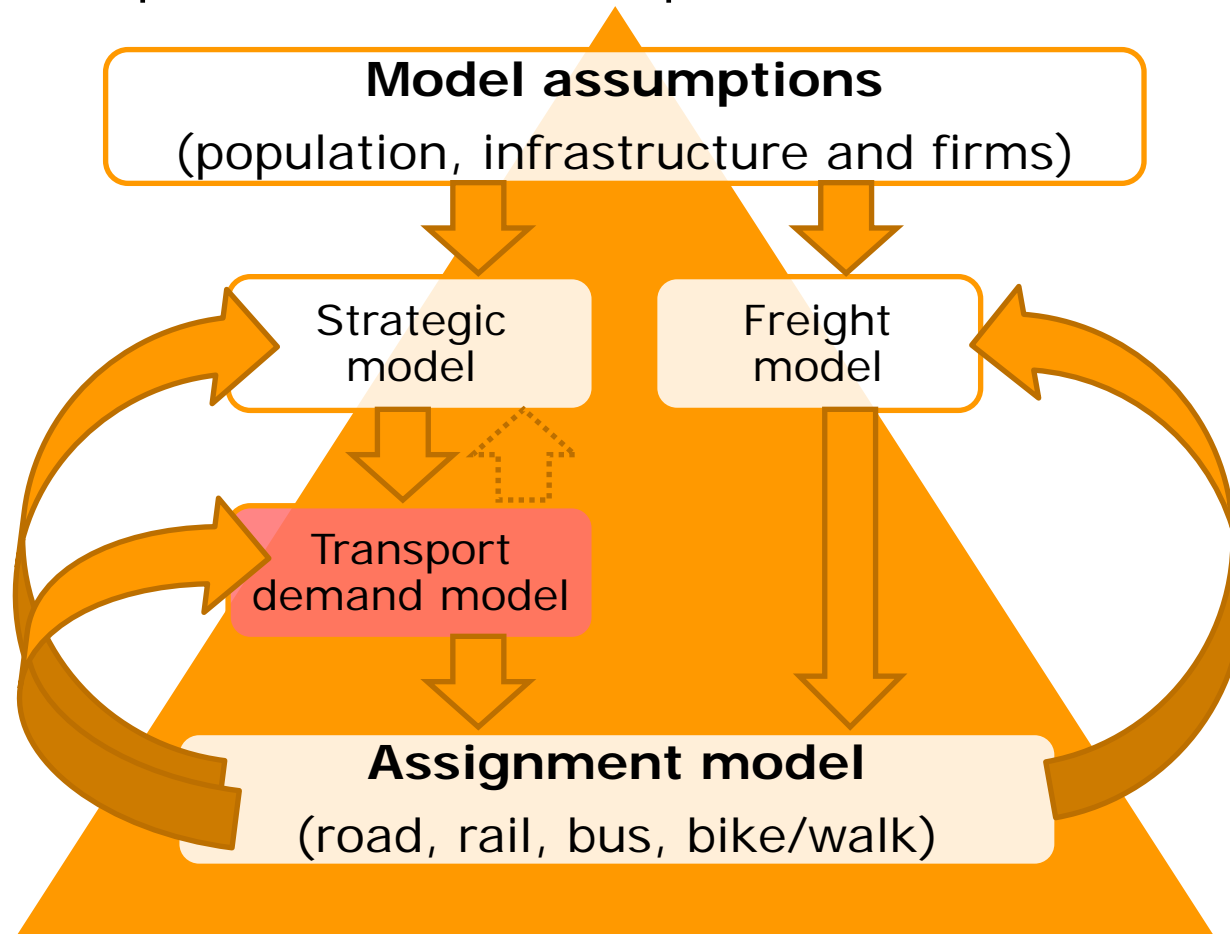
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Introduction

• The model presented will be a part of the new National Model

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Introduction

- Tourism is modelled in the "over-night" model
  - Hence, per definition, one day tourism trips will be represented as, e.g. leisure trips or trips with other purposes
- Tourism is modelled jointly with other over-night tour activities
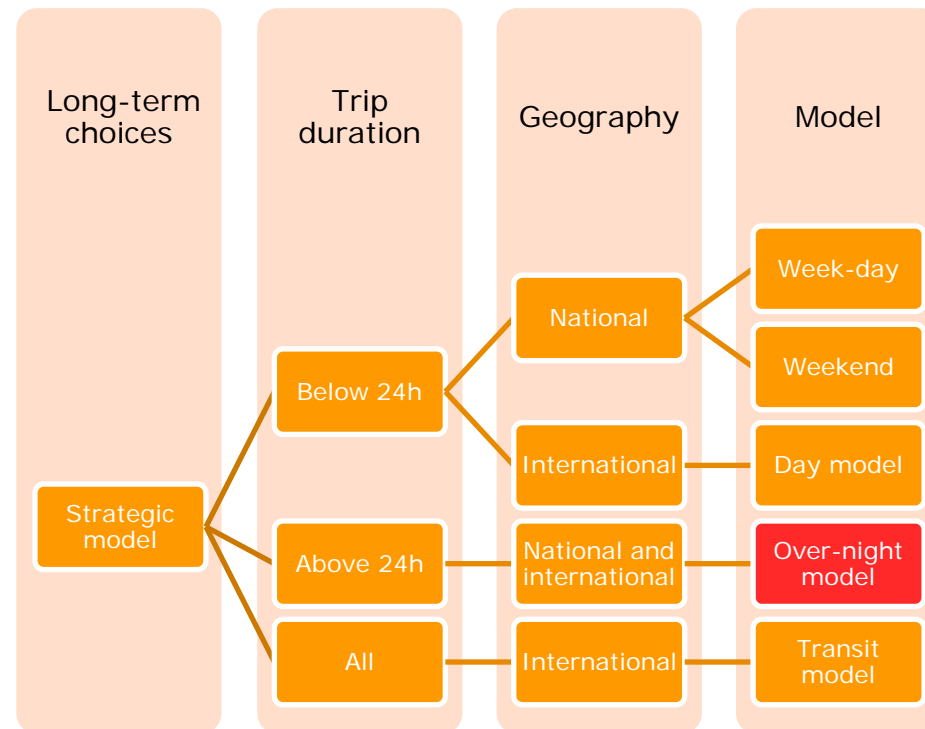
Model scope

- The aim of the National model is to predict and forecast transport that; (i) is carried out by Danish Citizens, and/or (ii) take place in Denmark

- As a result, we will be **concerned with**;
  - Danes going from, e.g. from Aalborg to Aarhus
  - Danes going from, e.g. Billund to Mallorca
  - Danes going from, e.g. Berlin centrum to Friedrichshain and back to their apartment in Berlin Centrum
  - Foreigners going from, e.g. Berlin to Copenhagen
  - Foreigners that transit through Denmark

- And **not concerned with**;
  - Swedes going from Uppsala to Stockholm

  (However, will be included in matrices to represent congestion)

- As a result, it will be possible to measure total transport generated by Danes living in Denmark (for overnight trips)

The scope of the over-night tourism model

- Include all passenger transport that;

  (i) is above 24 hours

  (ii) starts or ends in Denmark (irrespectively of the citizensship of the respondents)

  (iii) Can be classified as tourism

- Trips that are carried out as "sattelite tours" on the main journey

  – E.g., trips in a rented car on Mallorca

- Will enable us to "trace" the total mileage consumption for Danish citizens

Different models for foreigners and Danes

- Foreigners and Danes will be modelled in separate segments
- Danish register data available for Danish citizens
  - This will enable us to build a detailed population forecast for this segment
  - Due to this, we can apply a more advanced forecasting approach
- For Foreigners, we only have rather aggregate data available
  - As a result, we need to do forecasting using a simpler matrix approach

Statistical overview

- The segment of holiday tours are not neglicible!
- Around 50% of all our transport is traffic that involves "over-night" stay
  - Tourism constitute approximately 50% of this transport

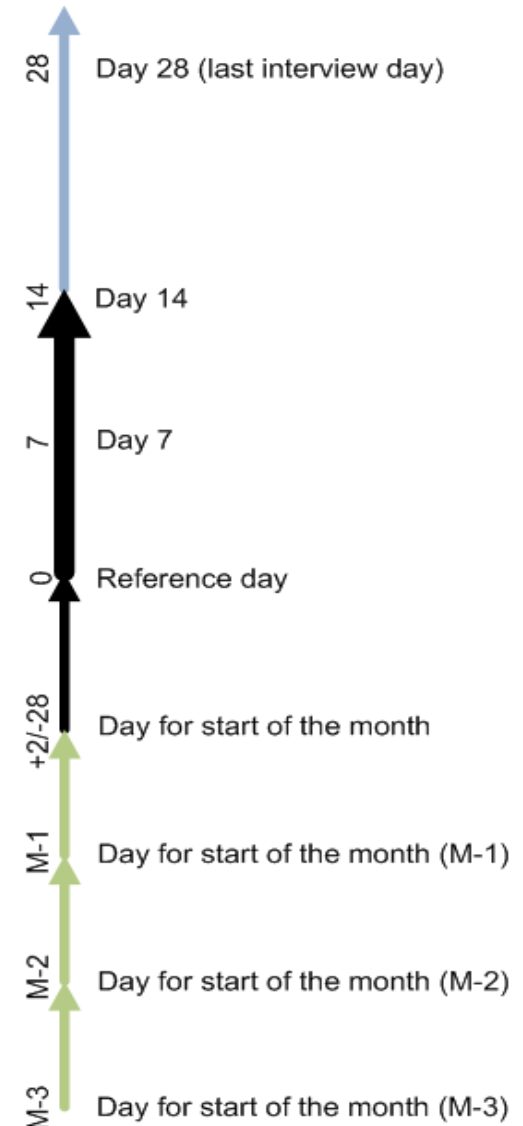| Category	Annual KM (all danes)	1-3 day trips	4 or more day trips
All	58.000.000.000	29%	71%
Holiday	***27.000.000.000***	*7%*	*93%*
Private	18.000.000.000	53%	47%
Business	13.000.000.000	43%	57%

Data sources

- In the beginning of 2010, a special over-night study was initiated
  - The questioners has been revised august 2010 and will run into 2011
- The study addresses several issues not covered in the TU
  - It describes the transport pattern over a 14 day period
  - It represent a "family perspective" in that people are asked to carefully pinpoint which members of the household who participated on the tour
  - It outlines holiday trips within the last year
- A main advantage is that we get a more solid hold on trips that include overnight stay
- In addition, there will be several border-surveys, which will be followed up by SP studies to analyse, e.g. transport across the Femern belt
  - These studies will also be of value to the overnight model

Time unit of modelling

- The typical time unit of modelling in the national model is a **24h period**

- This applies to the **week-day** model, the **weekend model**, and the **international day** model

- The standard unit of modelling in the over-night model will be **14 days**
  - This is due to how the overnight RP sample has been collected

Time in the overnight survey

- We define a **reference day 0**, and ask questions until 14 days after
- We keep reaching the respondent until 28 days after day 0
- For trips starting before 0, and ending between 0-14, we know the starting date (e.g. we can calculate the **trip duration**)
- For trips ending after day 14, we do not know the return date (we cannot calculate the trip duration)
- From august 2010, tours will be registered 3 month back in time (a more coarse level compared to the 14 day period) and long duration trips 1 year back

|	
28	Day 28 (last interview day)
14	Day 14
7	Day 7
0	Reference day
+2/-28	Day for start of the month
M-1	Day for start of the month (M-1)
M-2	Day for start of the month (M-2)
M-3	Day for start of the month (M-3)

Up-weighting the model

- Due to time-frame in the data the model will be defined according to the **return data** within the 14 day period

- In other words, a standard time-frame will be 14 days

- To properly up-weight the sample to an annual representative basis, we would therefore use a naive weight equal to 365/14 ~26.
  - In practise there will be a more detailed weighting scheme in order to deal with socio-economic representativity and seasonal variation

- If respondents have stopped the interview during the 14 day period, the period where they have been monitored will be shorter and the weight higher
  - In the 1. version of the survey there were two phone interview. In the 2. version there were only one phone interview, hence, in the second version more interviews will be "stopped"
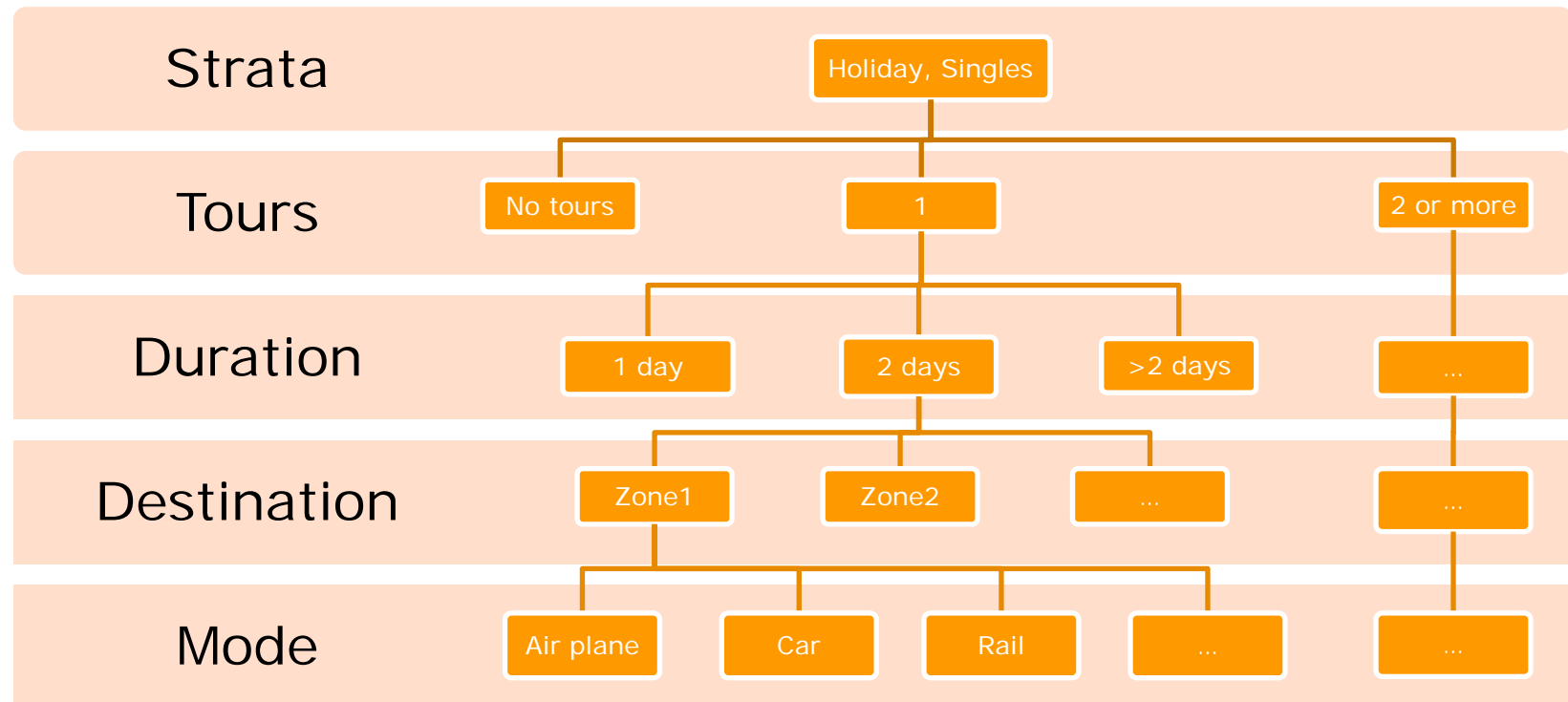
The tour chain definition

- The overnight model will be concerned with the trip to the main destination, most likely with the home as the origin

- Round trips and other atypical tours will be "simplified" to a "home-destination-home" type of tour

- Secondary tours that originate from the new main destination will also be part of the over-night model
  - To avoid double counting, this implies that the models that are based on TU should **only** consider home-based tours

Main destination

Secondary destination

Home
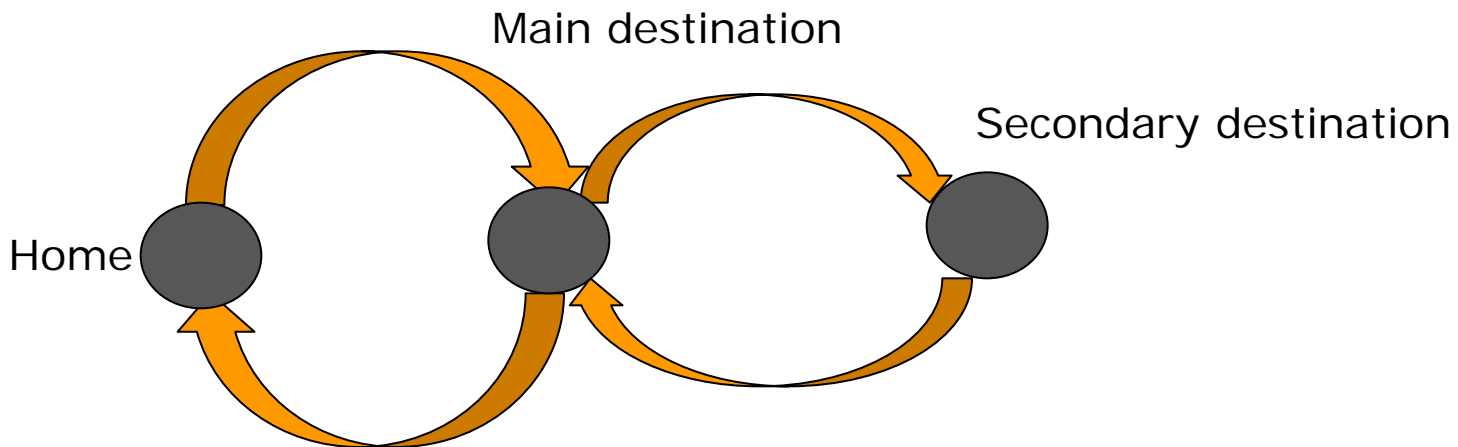
Stratification of the model

- For the main tour, we suggest a stratification according to **purpose** and **family participation**
- Purpose will divided into three categories
  - **Business**, **private**, and **holiday** tours
  - Work tours that include over-night stay is per definition classified as "business"
  - Private tours represent "visiting friends", "shopping tours",…
- Family participation will be divided into
  - **Singles**, **two adults or more**, **adults with children and others**
- This will result in a maximum of 9=3*3 model segments
  - Most likely, some of these will be eliminated or pooled due to poor sampling rates

Model structure – primary tours

Strata		Holiday, Singles		
Tours	No tours	1		2 or more
Duration	1 day	2 days	>2 days	...
Destination	Zone1	Zone2	...	...
Mode	Air plane	Car	Rail	...	...

Model structure – secondary trips

- Secondary trips are modelled conditional on the primary tours in order to take account of dependencies resulting from choices made for the primary tour
  - For instance, if the choice of mode is car, then most likely this will increase the likelihood of using car on the secondary tours as well
- We will not consider durations for secondary trips
- However, the size of travel group could be modelled

Destinations

- Tourism modelling is difficult because the "attraction" of the destination is more difficult to model
  - For e.g. commuting it is more clear as the number of workplaces can be used
- Characteristics of "over-night" and tourism trips
  - 77% of all trips (with over-night) is within Denmark
  - 74% of all vacations are international trips
  - 91% of visits (incl. stay in own vacation home) are national trips
  - Business trips with overnight stay is almost 50/50
- About 90% of all international trips is within Europe

	Total	Vacation	Visits	Business
Domestic	77 %	26 %	91 %	44 %
International	23 %	74 %	9 %	56 %

Most frequent destinations

- Many visits to Sweden
- Relative scattered pattern

The 10 most frequent destinations				
	Total	Vacation	Visit	Business
Sverige	15%	8%	43%	13%
Tyskland	13%	11%	15%	18%
Spanien	10%	12%	3%	5%
Italien	7%	9%	3%	3%
Norge	6%	5%	8%	11%
Frankrig	6%	7%	5%	5%
England	5%	5%	3%	9%
Østrig	4%	5%		
Grækenland	4%	5%		
Amerika	3%		2%	4%
Tyrkiet		3%		
Holland			3%	6%
Schweiz			2%	
Polen				3%

Summary and conclusion

- The tourism model is part of the "overnight model", which is one of 5 demand model modules
- We focus on traffic in and out of Denmark; both Danes and foreigners
  - However, different models for the two segments
- The holiday tour segment is important from a transport point of view
  - Much mileage (50% of all traffic is related to over-night stay, and 50% of this is related to tourism)
- A special over-night study has been conducted
- Model specification is based on "transport chains"
- We consider number of tours, duration, destination, and mode
- Destination choice is a challenge