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quantitative research

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Author(s)

Air survey

Recruitment results

Introduction

This presentation provides an overall documentation of the survey covering air passenger transport.

The survey was carried out by Significance, COWI and Accent on behalf of Sund & Bælt and Øresundsbro Konsortiet in collaboration with Vejdirektoratet.

Data from the survey is intended to be used to develop a new transport model covering the current, future and potential fixed links in Denmark. Find out more information about Fixed Links Transport Model (FLITMO) here.

The survey consisted of questions related to trips made and personal characteristics. Respondents were asked to participate in a set of experiment to determine their travel preferences.

Airports

- Relevant airports for this study are:
  - Copenhagen Airport (CPH)
  - Aalborg Airport (AAL)
  - Aarhus Airport (AAR)
  - Hamburg International Airport (HAM)
  - Göteborg Landvetter Airport (GOT)
- Future links
  1. Fehmern connection
- Potential links
  2. Helsingborg-Helsingør connection
  3. Kattegat connection
  4. Als-Fyn connection
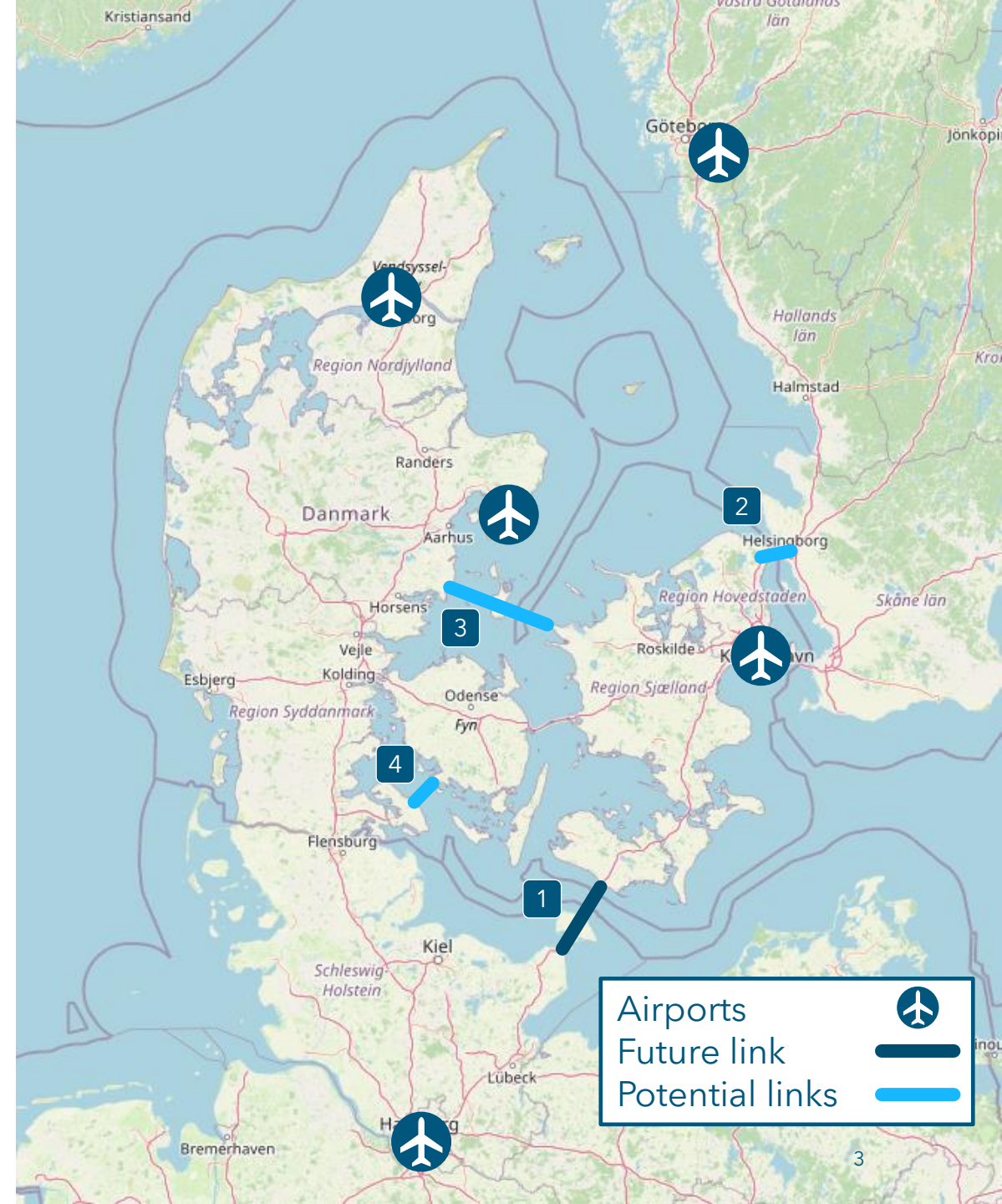
Information categories

Recruitment: where and how were respondents recruited for the study?

Response: what was the response rate of the survey?

Trip and travel characteristics: what kind of trips were made?

Personal characteristic: what did our sample look like?

Terminology

SP	Stated preference	Respondents are shown multiple choice task experiments, where they need to choose between options. For each task they state their preferred choice. These experiments are used to learn about people's travel preferences. (see example in Appendix)
RP	Revealed preference	Respondents are asked to describe their trips in detail, so that their preferred route/mode is revealed. It also aids to estimate the number of people traveling along important connections/links.
OD	Origin-destination	The combination of the origin location and destination location of an one-way trip.
	Screenlines	Imaginary geopgraphical border to count traffic from either side to the other. Important screenlines for this study are: ■ Denmark ↔ Scandinavia ■ Denmark ↔ Germany ■ West-Denmark ↔ East-Denmark.
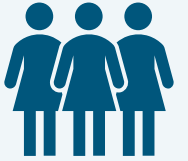
Recruitment

- Respondents were recruited between September 12th and November 21st in 2023.

- Recruitment conditions:

  - Intercept at Copenhagen Airport

  - Aided survey by instructors

  - Recruitment at departure gates of flights to airports of interest

  - Expected survey duration: 15-20 minutes

- Survey was provided in 2 languages:

Response statistics

- Key metrics on how many respondents were recruited
  - RP responses
  - SP experiments completed
  - Survey progress patterns
- Survey duration patterns
- Responses per day

Key metrics

- Total of 775 completed RP & SP responses

- 772 respondents to one of four relevant airports

- Recruitment proved to be difficult for multiple reasons and hence initial targets were adjusted. Survey continued until new targets were met, which is still enough for model estimation.
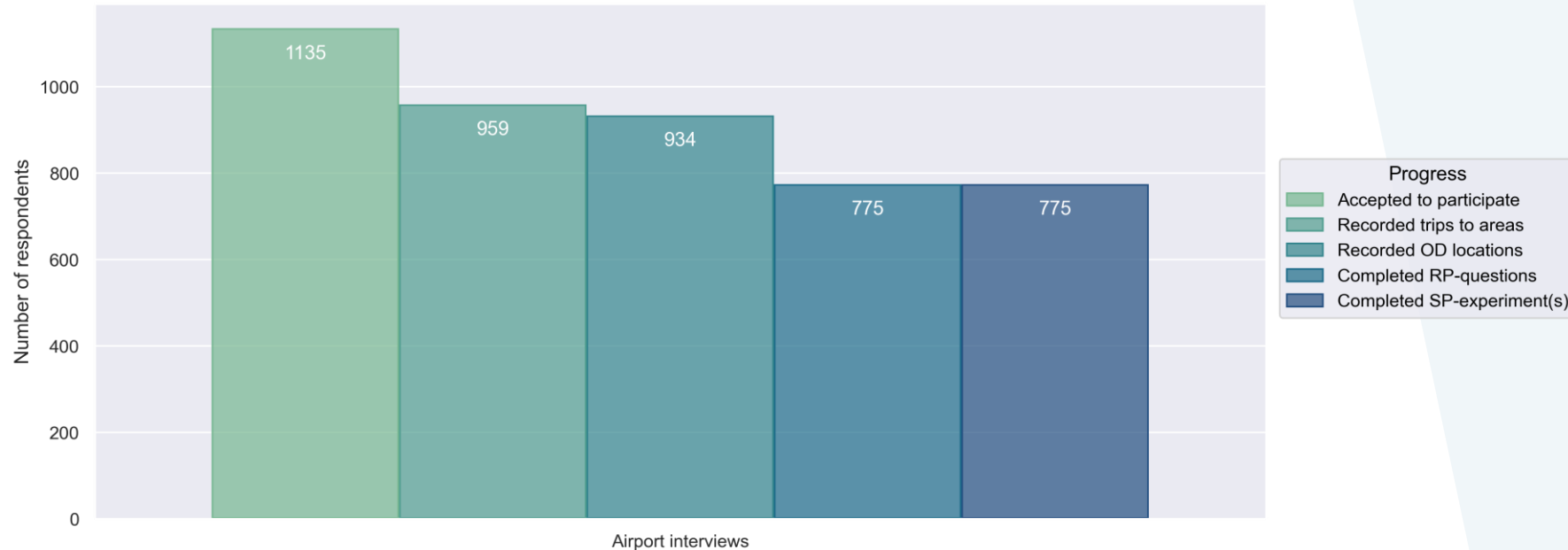
Route	🎯	✈
Copenhagen ↔ Aalborg/Aarhus	500	462
Copenhagen ↔ Hamburg	250	156
Copenhagen ↔ Göteborg	250	154
Total	**1,000**	**775**

# Survey progression per recruitment type

Recorded trips to areas: respondents indicated to which regions in northern Europe they travelled.
Recorded OD locations: respondents provided detailed origin and destination information.

A limited number of respondents does not complete the survey after accepting the terms, which is promising. Note that some respondents would not be able to finish the survey due to strict time window for airport surveys (gate changes, gate opening, boarding procedures).

Survey duration distribution per recruitment type

Survey completion time
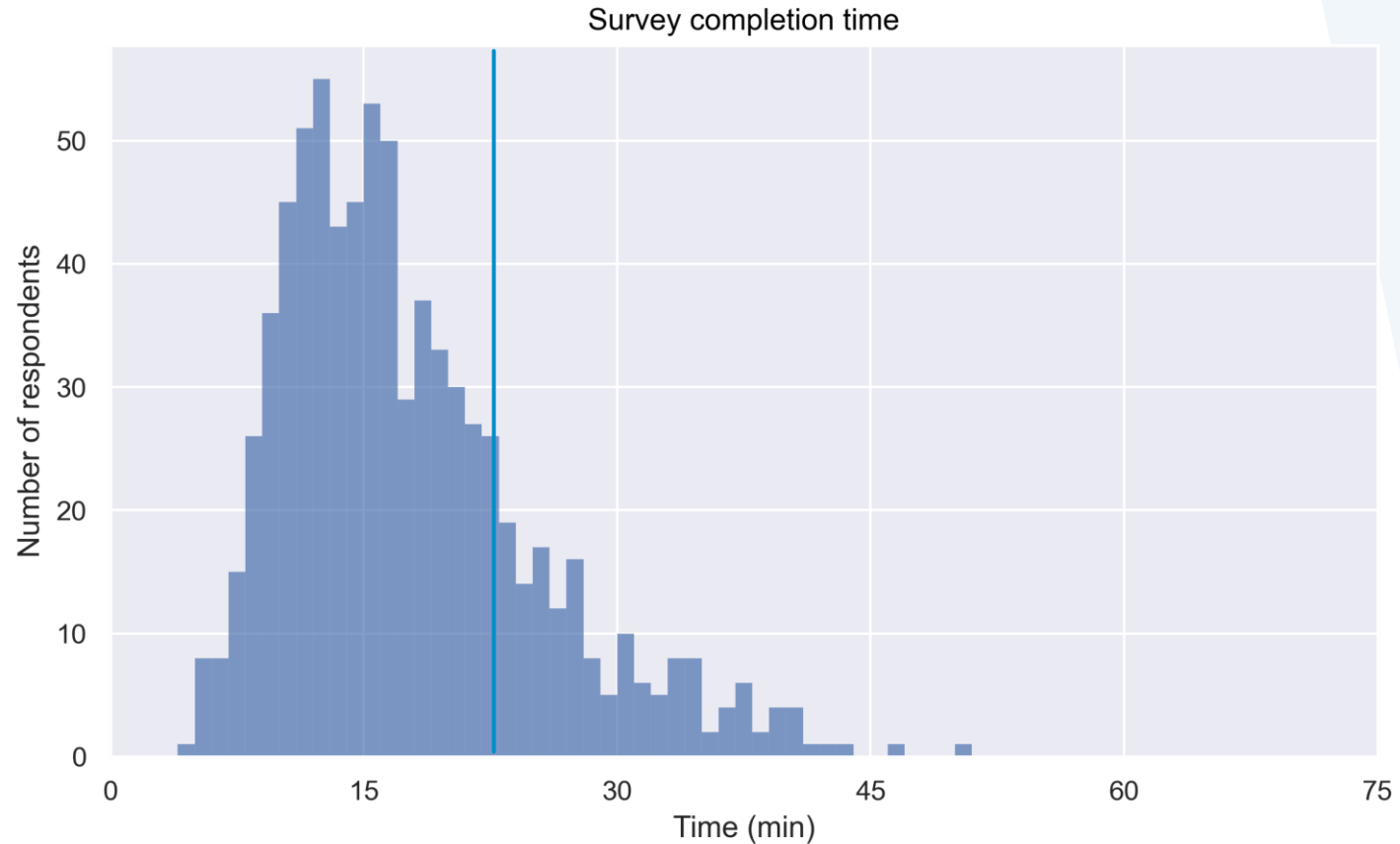
Average survey duration (line) for respondents was longer than anticipated, but the survey duration could be longer than expected due to the aid of instructors during the survey.

Conclusions based on response statistics

- Substantial dataset of observations collected for air travellers

- Initial targets were not feasible to attain, but minimum of 150 respondents per flight corridor has been achieved.

- Average survey duration surpassed expectation of 15-20 minutes.

- Majority of respondents completed the survey once started.

Trip & travel characteristics

- OD-locations

- Travel time and distance distribution

- Travel day distribution

Results in this section are based on data of all **completed** RP/SP survey responses
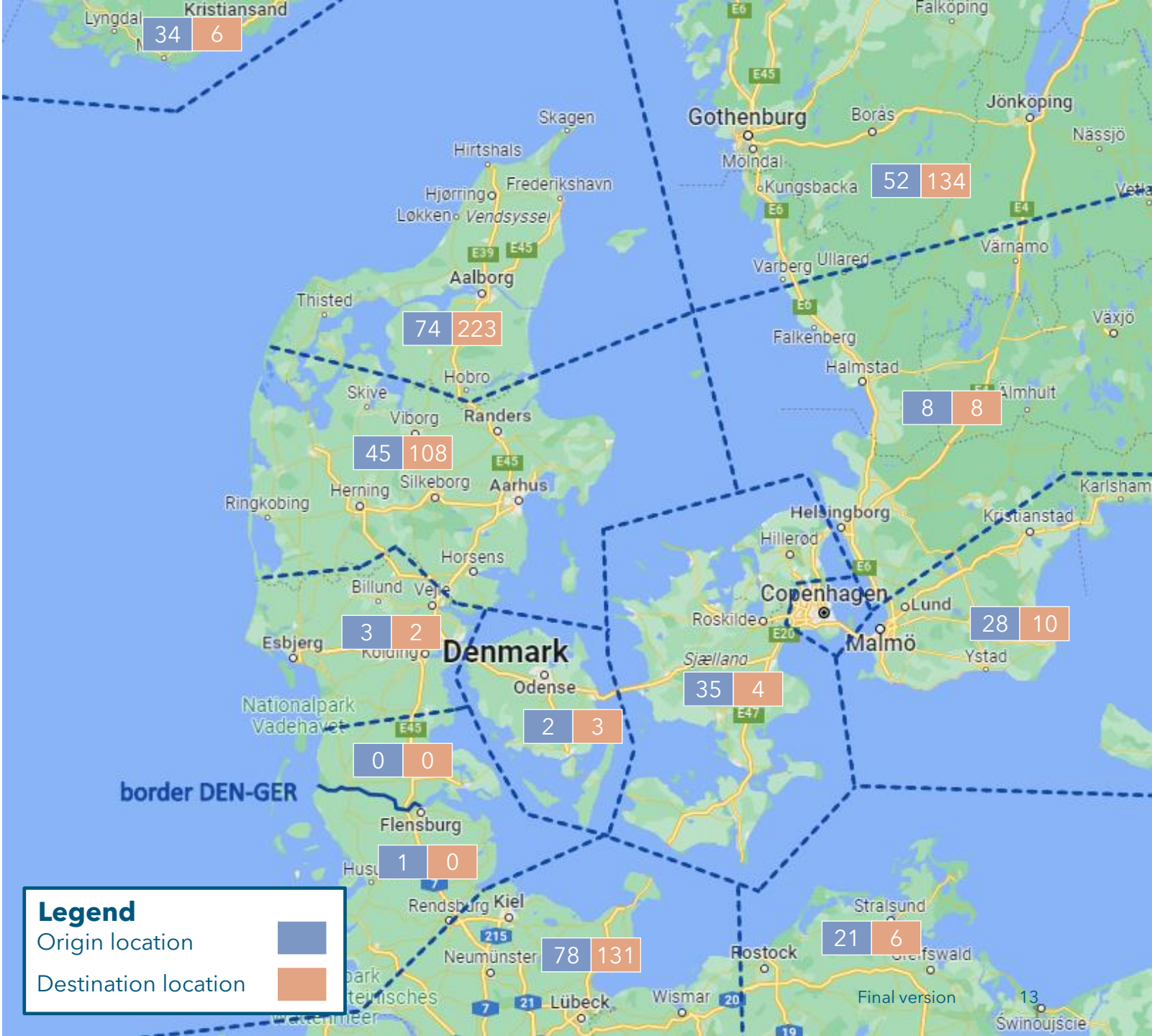
OD locations

Region Copenhagen `227` `75`

Outside Europe `167` `65`

- OD-locations are initial/final trip locations, including access/egress travel by other modes

- Respondents could have had transfers/layovers at relevant airports

- Map shows reasonable spread among zones, with large spikes in zones of relevant airports.

Legend
Origin location ▉
Destination location ▉

Travel time distribution
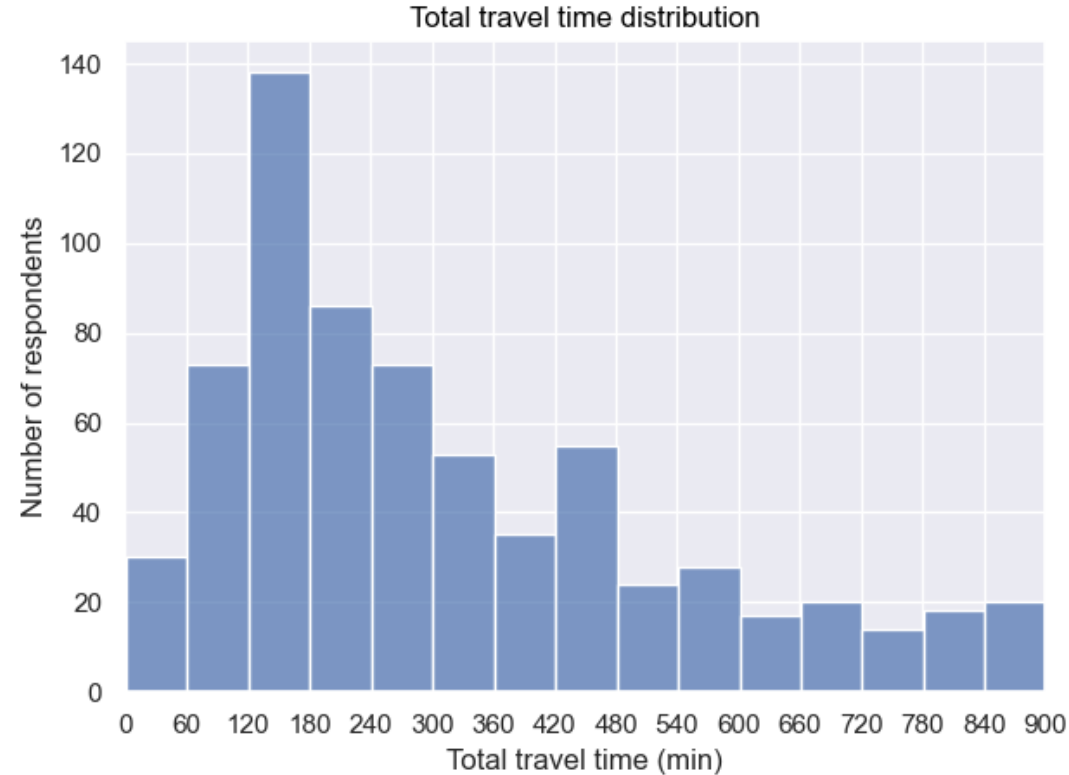
The travel time distribution follows intuition for air travel, including access/egress travel from/to the airport.

Conclusions trip and travel characteristics

- Adequate spread in travel time and distance distributions.
    - The distance distribution indicates some people misunderstood the survey brief, but it has no influence on the validity of the experiments (SP/RP)
- OD patterns follow intuition, with large numbers of observations in airport zones.
- OD locations of non-airport zones are also found, but can have multiple reasons:
    - Respondents having a transfer/layover at CPH airport
    - Trip consists of a flight and a prolonged trip by rental car/train
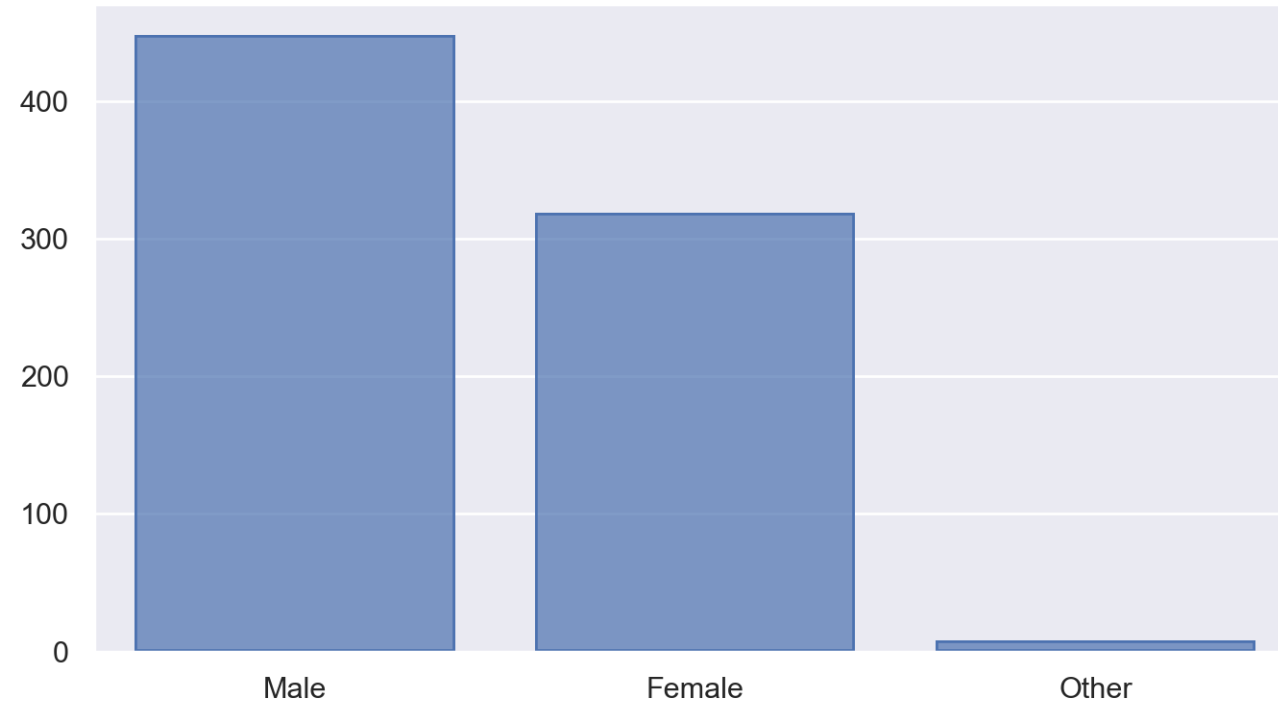   - Holiday traffic

Respondent characteristics

- Demographic descriptives
  - Gender
  - Age
  - Income levels
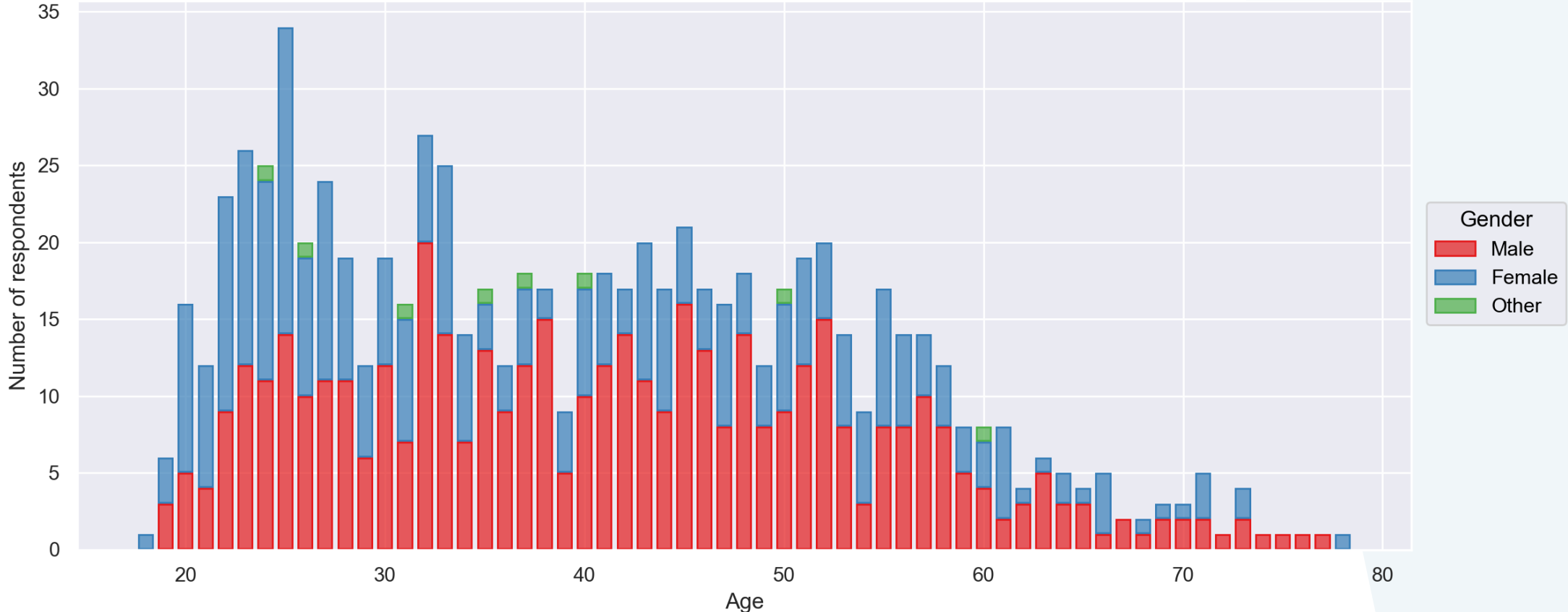 - Employment
- Trip purpose

Gender distribution

More male respondents in the collected data compared to female, but no issues in terms of data quality for model application.
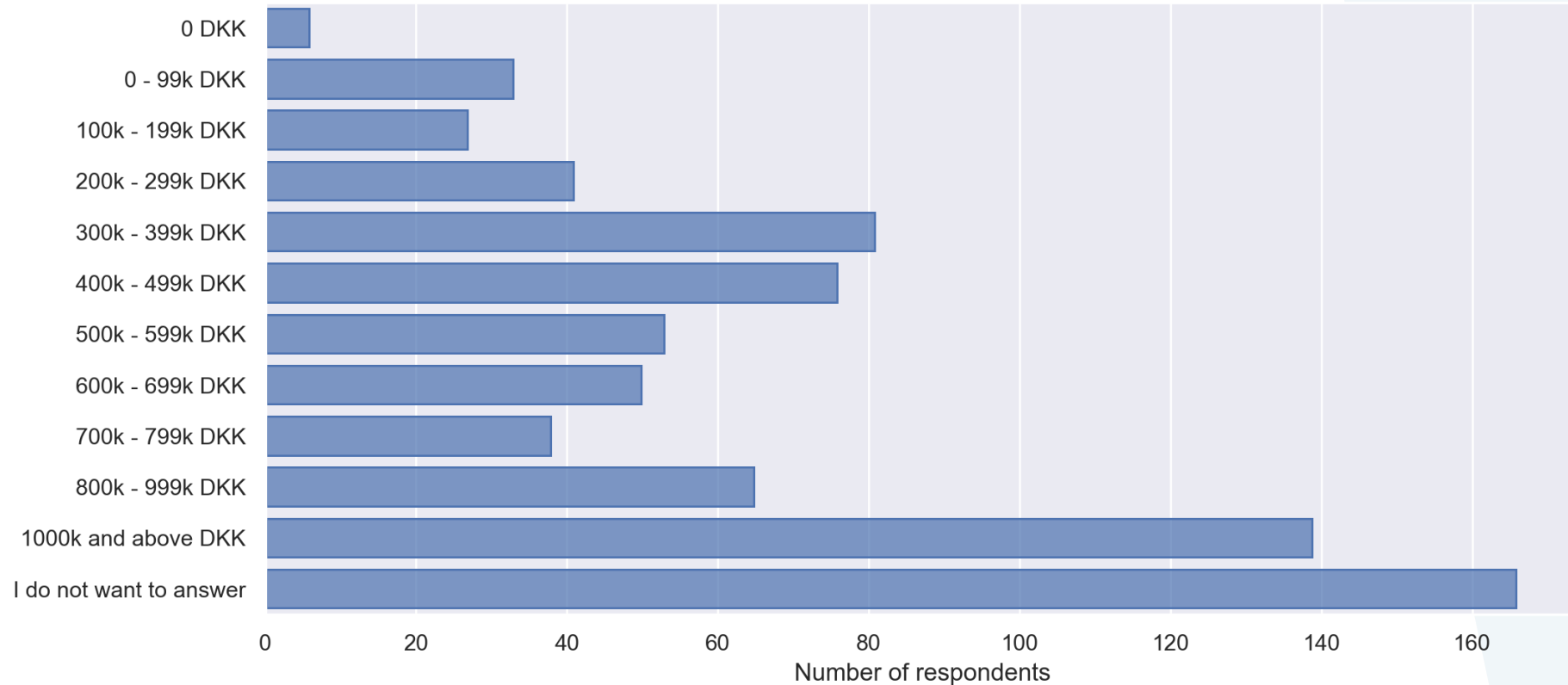
Age distribution split by gender

The age of respondents is very well-distributed in our sample, also when considering the age distribution per gender.
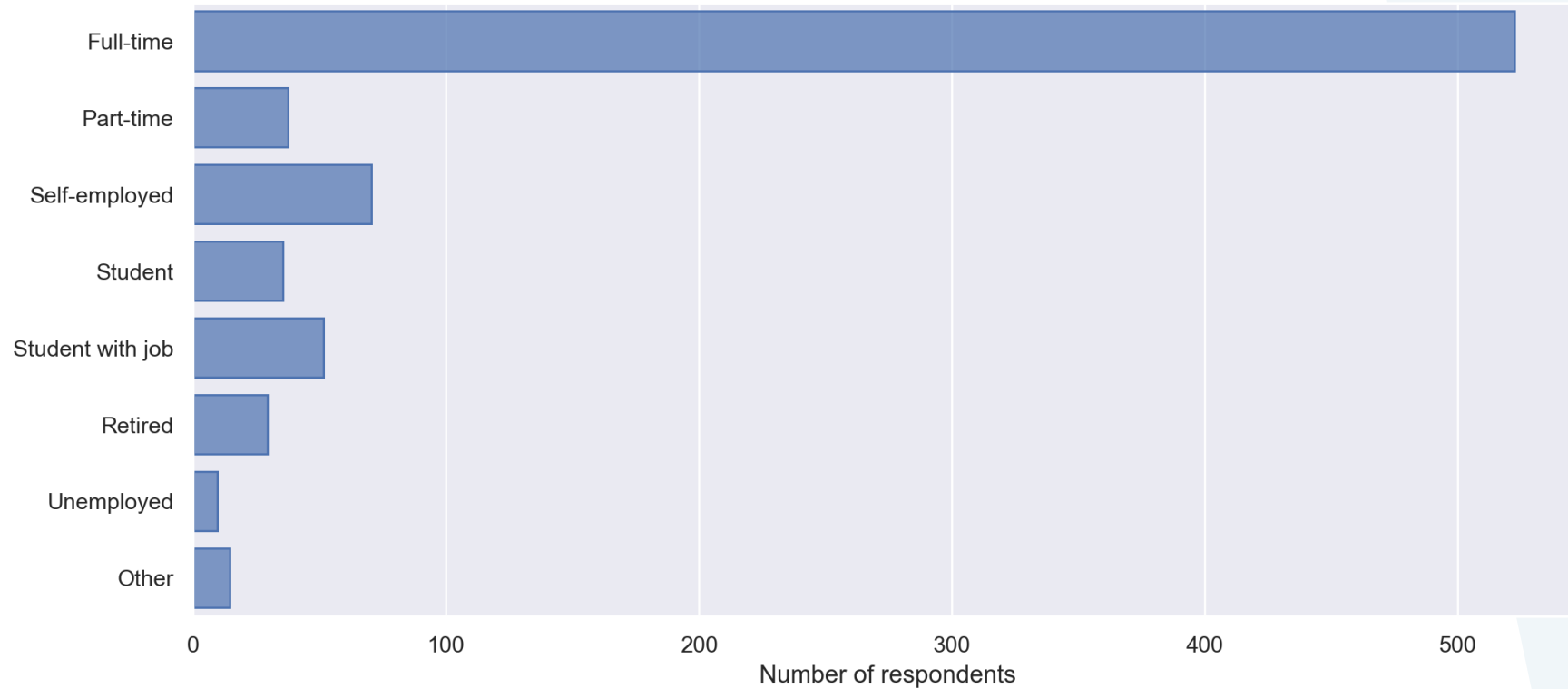
Household income level distribution

We observe a decent distribution of household income categories, with an emphasis on the highest income level category. 21% of respondents did not want to answer this question.
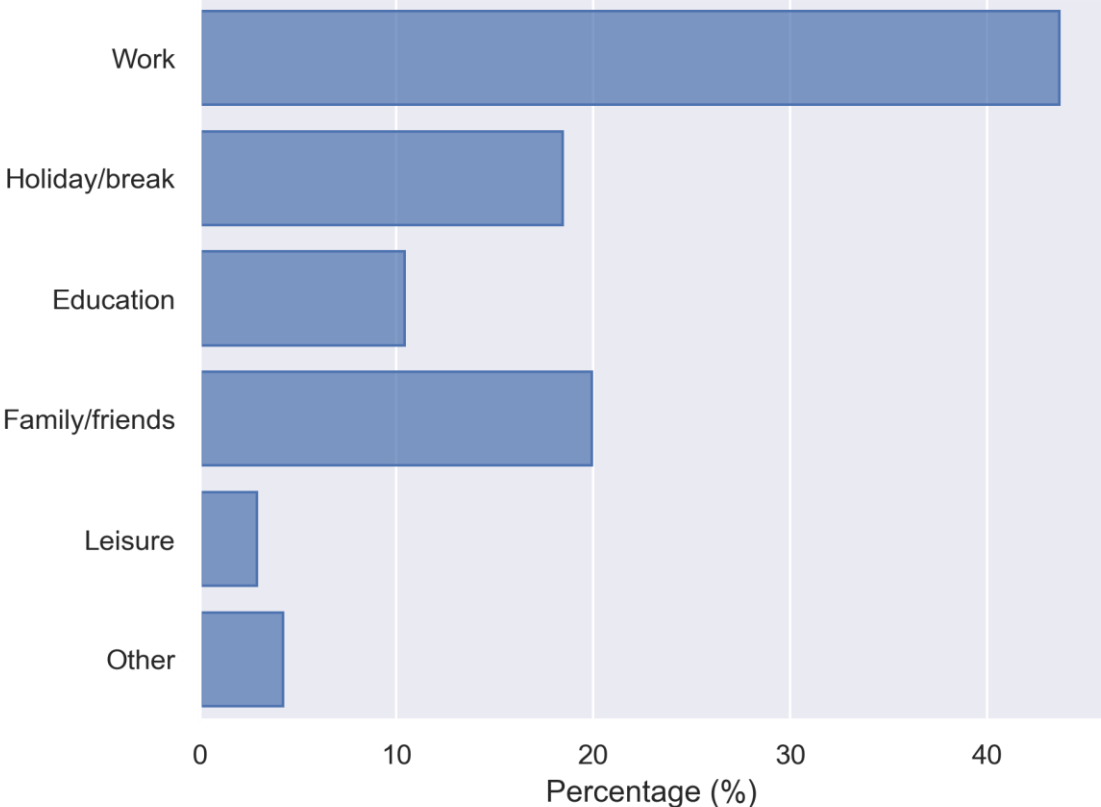
Employment distribution

💡 The vast majority of air passenger respondents is employed full-time.

Trip motive distribution

💡 More than 40% of respondents were travelling for work

Conclusions of respondent characteristics

- Distribution of most important demographics is more lopsided than from the regular passenger survey.

    - More male than female respondents in the data, but no reason of

    - Age and income level distribution is reasonably good

    - Employment and motive distribution are more lopsided

- Most of these effects are to be expected for air travellers which differs from other transport modes.

- Compared to the regular passenger survey (11% not stating income level), respondents were more hesitant to provide an income level (21%). The presence of a survey instructor could have made people more hesitant to state their income level.

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Example of an SP choice task

Which option would you prefer, A or B?

Airplane trip	Airplane trip
In-plane travel time: 1 hour 30 minutes	In-plane travel time: 42 minutes
Access & egress time: 40 minutes	Access & egress time: 40 minutes
Buffer/waiting time: 15 minutes	Buffer/waiting time: 15 minutes
Airplane ticket costs: DKK680.00	Airplane ticket costs: DKK850.00
Access & egress costs: DKK0.00	Access & egress costs: DKK0.00
Frequency of airline service: 3 times per day	Frequency of airline service: 2 times per day
○ Option A	○ Option B