CAMERA

Coordination and support Action for Mobility in Europe: Research and Assessment

Door-to-Door Travel in 2035: Results from a Delphi Study

Ulrike Schmalz, Bauhaus Luftfahrt e.V.

Agency Research Team (ART) workshop on passenger-centred mobility

Day 1: Status of Mobility Research in Europe – A Reality Check (ACARE WG1)

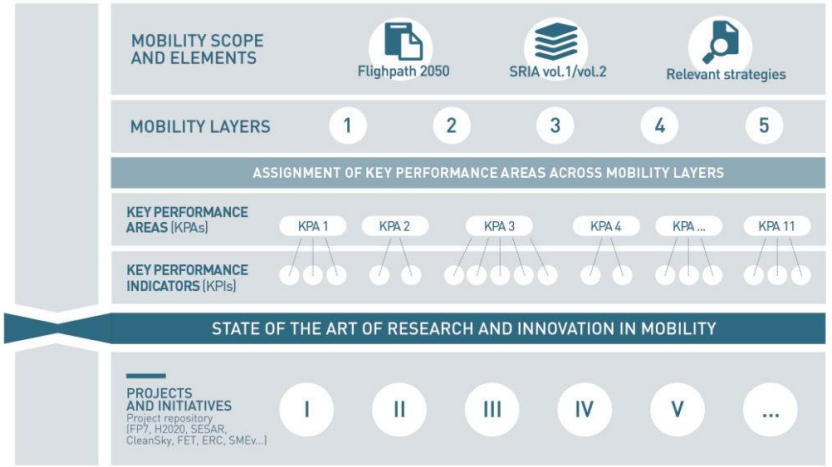
14 June 2021, online

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant Agreement n° 769606

Introduction to CAMERA

CAMERA Consortium:

1	innaxis	INNAXIS (INX)
2	UNIVERSITY OF WESTMINSTER	University of Westminster (UoW)
3	EUROCONTROL	EUROCONTROL (ECTL)
4	Bauhaus Luftfahrt Neue Wege.	Bauhaus Luftfhart s. V. (BHL)
5	deepblue CONSULTING & RESEARCH	Deep Blue srl (DBL)

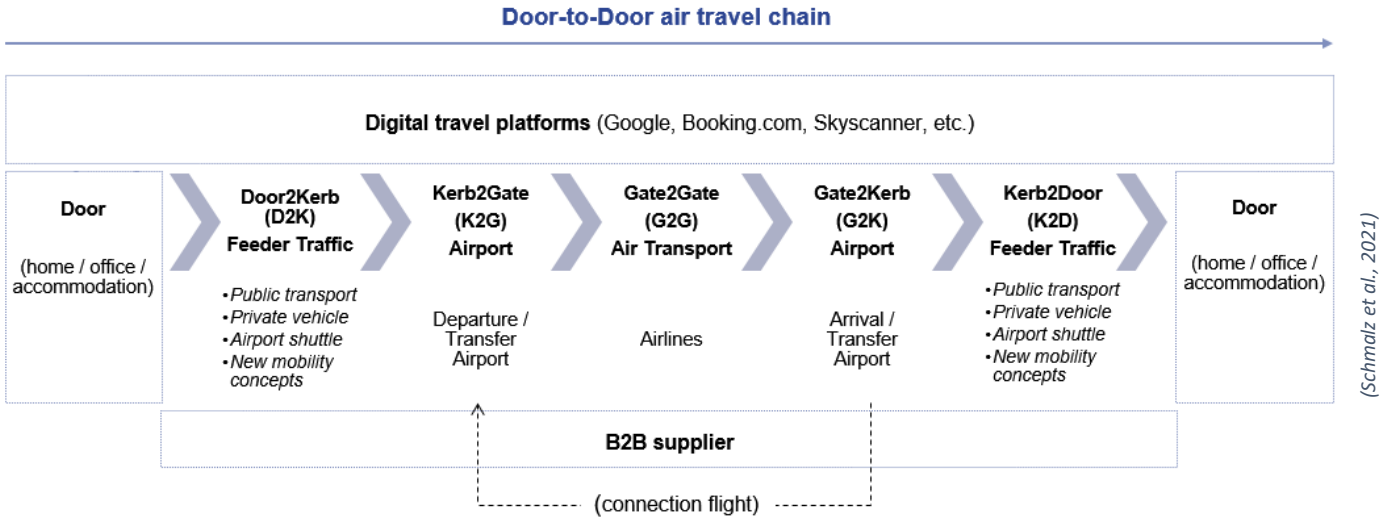


- Funded project (GA 769606) of H2020 “Identification of gaps, barriers and needs in the aviation research” MG1.5-2017 call
- Launched in November 2017 and will be concluded in October 2021
- Overall research questions: Are EU research and initiatives on the right trajectory to reach long-term goals in the (air) mobility sector? How far is Europe from the mobility goals envisioned for the future?

→ This Delphi study on the future of D2D air travel is an extension of CAMERA’s project work and was conducted in 2018/2019 together with the *WHU, Otto Beisheim School of Management* (Prof. Dr. Spinler & Prof. Dr. Ringbeck)

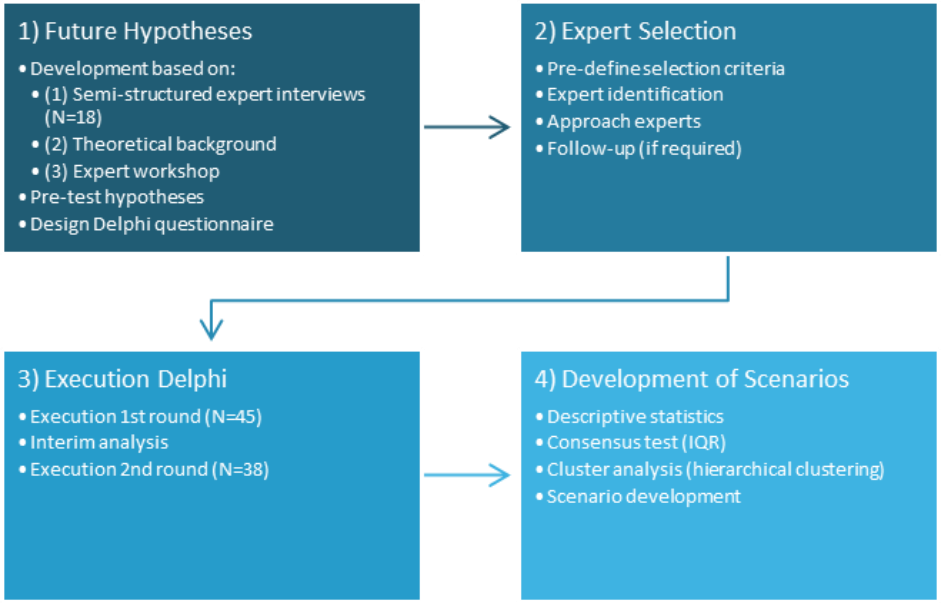
Motivation of the Delphi Study

- Shed light on what future European D2D air travel could look like
- Passenger view: gaining a better understanding about novel passenger needs and requirements in 2035 (demand side)
  - Supporting development of intermodal travel products and services
- Market view: capturing future travel trends on the supply side along the D2D travel chain
  - Supporting strategy and decision making of mobility providers



The Delphi Technique Approach

- First proposed in the 1950s by RAND company
  - Structuring group communications
  - Answering current and prospective research questions
  - Characterized by anonymity, iteration, controlled feedback and statistical "group response"
- Our Delphi setting
  - Focused on 2035 and long-haul air travel in the European market
  - Invited mostly European mobility experts from industry and research



Design of this Delphi study, depicted as four-step research approach adapted from von der Gracht & Darkow (2010)

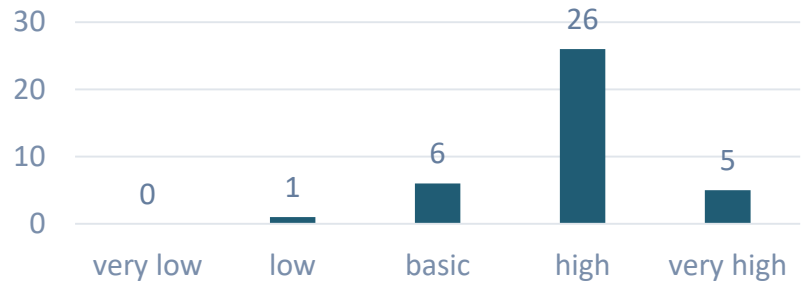
Probability	Not probable ☐	Improbable ☐	Somewhat improbable ☐	Neutral ☐	Somewhat probable ☐	Probable ☐	Very probable ☐
Impact	Very weak ☐	Weak ☐	Somewhat weak ☐	Neutral ☐	Somewhat strong ☐	Strong ☐	Very strong ☐
Desirability	Very undesirable ☐	Undesirable ☐	Somewhat undesirable ☐	Neutral ☐	Somewhat desirable ☐	Desirable ☐	Very desirable ☐
Personal view							

Assessment of projections on a 7-point Likert scale

Expert Panel

Self-Assessment Expertise

How would you assess your expertise for answering these questions?



Experience Mobility Sector & Gender

Ø14 years experience in mobility sector

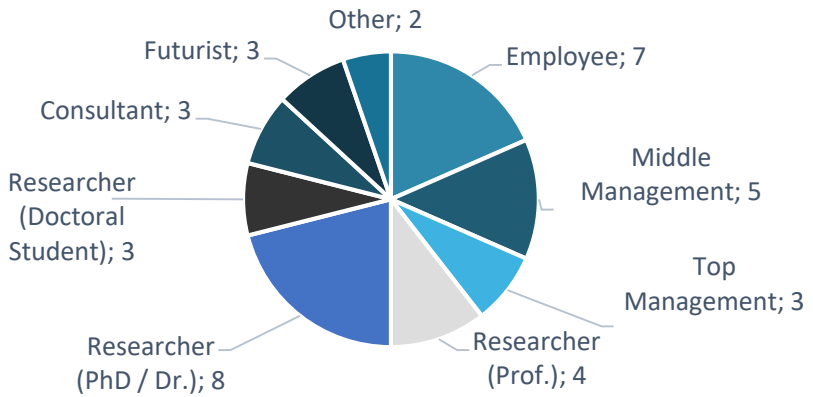
Range: from 3 yrs. to > 40 yrs.

39% female panelists

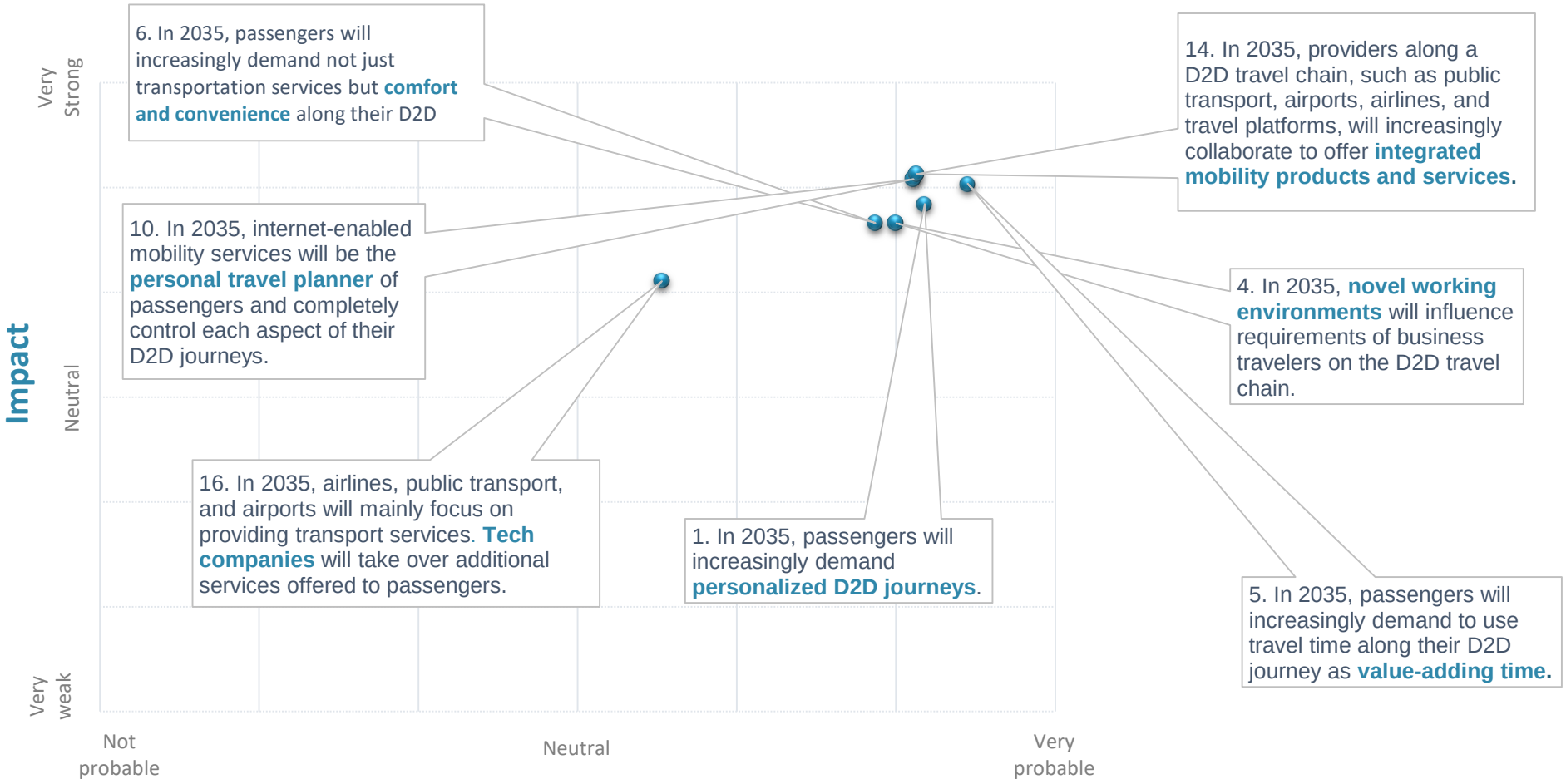
Country Segmentation

Country	#
Germany	30
Switzerland	2
Spain	2
Austria	1
France	1
Netherlands	1
UK	1

Position of Panelists



Results (1/2)
Confirmed Trend-Hypotheses



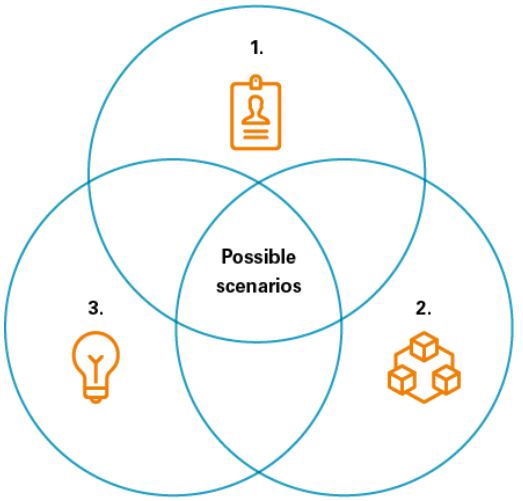
Seven trend hypotheses reached consensus among the expert panel (threshold IQR ≤ 1)

Results (2/2)
Future Scenarios on D2D Travel

1. PERSONALIZED TRAVEL
- Digital-controlled travel for increasing passengers' experience
- High personalization focusing on customer needs while also creating comfort and convenience

2. INTEGRATED TRAVEL
- Most probable scenario
- Collaboration between providers aiming to offer integrated, intermodal and seamless transport services
- Creating valuable travel time for passengers
- Focusing less on differentiated products from individual mobility providers

3. GAME CHANGER
- Scenario with the lowest probability but considered as the black swan scenario
- Monetization of the aircraft cabin by technology companies (e.g. in-flight entertainment, catering, in-flight shopping)
- Disrupting the supply side and changing revenue streams for established mobility companies, which become pure transport providers from A to B



Intermodal, long-haul air travel from door to door in 2035

Key Takeaways

- In 2035, digitalization and personalization will be significant drivers for future D2D air travel.
- In 2035, passengers will demand to spend their travel time in a value-adding way, e.g. working or being entertained.
- In 2035, passenger type, age, origin, and available travel budget will still be influential factors.
- Future, differentiated passenger needs can open up new business opportunities and improvement potential for intermodal travel.
- Mobility providers are advised to adopt measures aimed at the personalization and digitalization and to establish partnerships.
- Researchers are advised to focus on the identified trends but also to open up the research scope, e.g. by including tech companies and re-define our understanding of mobility and travel.

Thank you!

Contact

Ulrike Schmalz, Bauhaus Luftfahrt e.V.
ulrike.schmalz@bauhaus-luftfahrt.net

Link to the papers

- Kluge, U., Ringbeck, J., & Spinler, S. (2020). Door-to-door travel in 2035–A Delphi study. *Technological Forecasting and Social Change*, *157*, 120096. https://doi.org/10.1016/j.techfore.2020.120096
- Schmalz, U., Spinler, S., & Ringbeck, J. (2021). Lessons Learned from a Two-Round Delphi-based Scenario Study. *MethodsX*, 8, 101179. https://doi.org/10.1016/j.mex.2020.101179

Other references

- Von der Gracht, H, & Darkow, I. L. (2010). Scenarios for the logistics services industry: A Delphi-based analysis for 2025. *Int. J. of Prod. Eco.*, 127(1), 46-59.
- Schmalz, U., Ringbeck, J., & Spinler, S. (2021). Door-to-door air travel: Exploring trends in corporate reports using text classification models. *Technological Forecasting and Social Change*, *170*, 120865.

Technological Forecasting & Social Change 157 (2020) 120096

Contents lists available at ScienceDirect

Technological Forecasting & Social Change

journal homepage: www.elsevier.com/locate/techfore

Door-to-door travel in 2035 – A Delphi study

Ulrike Kluge[a,*], Jürgen Ringbeck[b], Stefan Spinler[b]

[a] Bauhaus Luftfahrt e.V., Willy-Messerschmitt-Straße 1, 82024 Taufkirchen, Germany
[b] WHU - Otto-Beisheim School of Management, Burgplatz 2, 56179 Vallendar, Germany

ARTICLE INFO

Keywords:
Cluster analysis
Delphi method
D2D
Door-to-door mobility
Future mobility
Scenario development

ABSTRACT

Intermodal, door-to-door (D2D) travel is gaining momentum for airlines, airports, and feeder traffic providers. At the same time, competition is increasing; having a better understanding of future travelers' requirements regarding D2D mobility is crucial for the mobility sector, for planning long-term, adapting products and services accordingly, and improving the overall passenger experience. Little information is available on this matter and gathering data in the future may be challenging. This paper considers future projections of European air passengers, and their requirements, for the entirety of the D2D travel chain, including long-haul air travel and airport access and egress modes. The research is based on a two-round Delphi survey (time horizon 2035) with 38 experts, incorporating panelists from the transport industry, academia, and consultants. The Delphi survey is supplemented with findings from a preliminary study, combining expert interviews ($N = 18$), a literature review, and an expert workshop. Based on the results from a hierarchical cluster analysis, the paper presents three possible future scenarios: (1) personalized D2D travel, (2) integrated D2D travel, and (3) the game changer.

1. Introduction

1.1. Relevance of door-to-door air travel

The airline industry is paying increasing attention to passengers' entire door-to-door (D2D) travel experience rather than considering the flight segment only (Airliners.de, 2018; Tritus, 2018). Intermodal travel products for air passengers, such as Rail&Fly by Lufthansa and Deutsche Bahn (Lufthansa, 2019) or the partnership between the application MyTaxi and Eurowings (Eurowings, 2018), have already entered the market. In today's liberalized market, passengers can choose between numerous booking opportunities, airlines, airports, and ancillary products. Digitalization throughout the travel chain creates new opportunities, not only for transport companies but also for digital platforms that serve passengers. Platforms offering convenient, seamless booking experiences, e.g. Google, Airbnb, Uber, and Kayak (Javornik et al., 2018), increase competition. New infrastructure projects and emerging mobility concepts, providing feeder traffic options, such as ride-railing, can alter passengers' mobility patterns (Young & Farber, 2019). Journey times to airports can influence passengers' choices, particularly regarding which airport to pick (Parrella, 2013). Supplementary trends, like the current environmental debate and flight shaming, might also alter customers' D2D air travel. At the same time, airlines increasingly offer products tailored to differentiated customer needs, for instance a premium-economy cabin class on long-haul routes[1] (Kuo & Jou, 2017).

To stay competitive and develop innovative, intermodal products, airlines and other travel companies should understand what travelers might want from integrated D2D mobility in the future, in addition to what successful D2D mobility offers could look like within this new paradigm. Enhanced knowledge may improve today's overall passenger satisfaction by reducing current travel *pain points*. Meeting or even exceeding passenger expectations creates customer satisfaction, which in turn leads to loyalty and positive word-of-mouth recommendations. These are important today, with user-generated online reviews that are accessible to everyone (Sezgen, Mason, & Mayer, 2019). Prospective customer desires can then be translated into passenger needs, cross-selling opportunities, and ultimately, new products or services (possibly realized through partnerships). However, despite its increasing importance, little research has been conducted to explore the future D2D travel market. Hence, the following research question emerges: *What could future D2D air travel look like?* This paper examines the relevant projections affecting future D2D air travel in Europe. It is here explored how the demand (passenger view) and supply side (transport market) of D2D air travel could develop and which scenarios could possibly occur.

* Corresponding author.
E-mail addresses: ulrike.kluge@bauhaus-luftfahrt.net (U. Kluge), juergen.ringbeck@whu.edu (J. Ringbeck), stefan.spinler@whu.edu (S. Spinler).
[1] Passengers are willing to pay additional US$545 to enjoy this upgrade from the economy class on long-haul round-trips (Kuo & Jou, 2017).

https://doi.org/10.1016/j.techfore.2020.120096
Received 19 December 2019; Received in revised form 24 March 2020; Accepted 2 May 2020