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ON KEY PARAMETERS FOR THE ATTRACTIVENESS OF ON-DEMAND INTER-CITY AIR MOBILITY

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Abstract

In this paper, we present a globally applicable approach for estimating the potential passenger demand for On-Demand Inter-City Air Mobility based on three different use cases. All of these cases are concerned with passengers who nowadays travel with conventional airlines, and might choose On-Demand Air Mobility (ODAM) as an alternative mode of travel in future. First, we consider the possibility to complement direct connections on low-demand inter-city routes. Second, we analyse the possibility of replacing multi-stop connections, where the origin and destination airports are within a certain range. Third, we take a look at feeder flights from small or regional airports to bigger hubs and vice versa. The approach is then used for estimating the impact of five parameters on the ODAM market size. These are namely air taxi speed, air taxi range, the set of usable airports, a time offset which is added to the flight time of every trip and the availability of alternate airports. We conduct this investigation for four regions: China, Europe, India, and the US and analyse the differences between the various parameters over the different use cases in these regions.

The results show that the potential market size differs widely between regions, use cases and parameters. The largest potential market overall can be identified in Europe with approximately 6.7 million PAX and about 582 Million USD revenue per year. For all regions, in total, complementing direct flights attracts most people to use ODAM as an alternative way of transportation. Considering that the value proposition of ODAM is the reduction of travel time, both technical and operational parameters of air taxis show a high impact on the potential market size. Compared to cars, their advantage lies in the higher speed, whereas the absence of schedule delay is the main advantage compared to conventional air travel.

Keywords: On-Demand Air Mobility, Air Taxi, Passenger Demand

1. Introduction

On-Demand Air Mobility (ODAM) is a rapidly growing research field which attracts a lot of resources both from science and industry. One line of research in this field focuses on the technical development of new vehicle types and their electric propulsion. Some companies, some of them newly founded, like Uber [22], Lilium [11] or Volocopter [23] but also scientific institutions like RWTH Aachen [19] are working on new types of aerial vehicles and their propulsion.

Another line of research is dealing with the operational side of ODAM, including aspects such as infrastructure design, operational planning and constraints, competitiveness with other transportation modes or the estimation of potential passenger demand [20].

In this paper, we focus on the impact of technical and operational parameters on the demand for individual inter-city air mobility and how variations of these parameters lead to a change in the potential market size. Technical parameters we take into account are the range and speed of the air taxi, whereas operational parameters considered are the airports which can be used, a time offset for the ODAM operation (representing the non-flying trip times) and the availability of alternate airports near the original airports. Detailed explanations will follow later on.

Most previous studies dealing with the operational side of ODAM and the determination of passenger demand make various assumptions regarding factors like social acceptance, safety concerns or willingness to pay, respectively the pricing structure or costs of an ODAM service. This is justifiable, since it is a question of determining a future demand, which cannot be done without making fundamental assumptions. However, it should be noted that these are mostly regionally dependent factors.

For example, an older study by Decker et al. [5] assumed that in a typical european city a number of approximately 300.000 people commute every day into the city and ten percent of this daily car traffic can be replaced by individual air traffic. Kreimeier et al. [10] estimated an ODAM market share of 19,1 % (car 77,8 % and CS-25 air transportation 3,0 %) assuming a cost gap of 0,1 €/km between an ODAM operation and the use of a car, which leads to a potential market of 235 million trips per year in Germany. As the cost gap increases, the potential market share and thus the demand decreases. In addition, a large number of studies focus on specific cities and their metropolitan regions to estimate the potential demand for ODAM passengers in these areas. For example, Fu et al. [8] conducted a case study for Munich, Rajendran et al. [14] focused on New York, and Antcliff et al. [3] took a look at the San Francisco Bay Area. While all of the papers mentioned above use fundamentally the same parameters (such as those mentioned before), they are highly regionally different and therefore need to be considered and assumed in a differentiated manner for every city.

Hence, the number of different assumptions and various parameter settings made in the different studies can only be assumed to be valid for the particular cases. This leads to different results for various regions and various use cases. There is neither a consistent way to compare the results [20], nor is it possible to draw a globally applicable approach to estimate the ODAM passenger demand from them.

In contrast, we provide a globally applicable approach to determining passenger demand. Whilst demands estimated in this way do not consider regional details, they are consistent between cities and regions. Furthermore, these estimated demands are based on the number of passengers who actually travelled by aircraft, either via a direct flight, or including a transfer. Accordingly, real figures are used to determine the size of a potential market and not future forecast values. Thus, this figure implicitly contains the level of competition between air transport and other modes of transport. In summary, we present an approach which provides an innovative opportunity for global assessment of a future market that varies widely from region to region.

2. Methodology

In order to estimate the market size for ODAM with respect to a set of parameters, we proceed as follows. First, we compute the number of passengers who travelled in the respective region and in a way which fits our use case, e.g. all passengers travelling on a direct flight from their origin to their destination inside Europe. The data that this computation is based on is described in detail in Section 2.1, and the use cases are detailed in Section 2.2. Then, we check how many of these passenger might also have travelled via air taxi, given that the air taxi is feasible and more attractive, i.e. faster, than conventional air travel on this route. This is based on a set of technical and operational parameters, which we discuss in Section 2.3.

2.1 Database

Our demand estimation is based on the Origin&Destination (O&D) passenger demand from Sabre Market Intelligence (Sabre MI) [4]. The Sabre MI database contains information about all commercial passenger flights, and all passenger bookings world wide. The data set we used contains information about the number of passengers travelling between O&D-pairs on an airport level, together with the actual itinerary. For this paper, we used demand data for 2019 as this shows a pre-covid state of the air transport system. E.g. an entry in this data set might be "x passengers travelled from HAM to JFK via FRA in June 2019". Additionally, there is information about the fares paid. We can thus obtain the realised demand for direct connections from it, but also the number of passengers who travelled between city pairs where passengers travelled via multi-stop connections. Furthermore, we can identify feeder flights based on this data.

2.2 Use Cases

We consider three use cases. First, we consider city pairs between which direct flights are offered, but where the schedule delay [18] is high, for example due to a low frequency of the offered flights. In this case, ODAM, operated by an air taxi, might offer a time advantage over the use of a scheduled flight. Therefore, it could be an attractive alternative which might complement, or even replace, traditional air travel within a certain scope.

The second use case is concerned with origin-destination airport pairs which are origin and destination of itineraries, but between which no direct flights are operated. Thus, passengers travelling on these itineraries must change the aircraft at least once. In such cases, direct flights operated by ODAM might reduce both travel time and schedule delay. As we consider actual demand data, we can make sure that only cases are included in which air travel is a competitive mode of travel already.

Third, we consider feeder flights from small airports to airline hubs and vice versa. Here, it might be interesting to offer an ODAM service such that travellers can arrive just in time to catch their connecting flight or do not miss a flight due to delay of previous scheduled flights. This use case might be of interest for network carrier, as it might allow them to reduce the number of feeder flights, which in many cases are unprofitable. Furthermore, it might yield more flexibility when planing connections through a hub.

We consider these use cases for four regions: China, Europe, India and the United States, as these form large markets with homogeneous regulations, and no form of visa is required for travelling inside these regions. Additionally we assume that ODAM markets tend to be regionally limited as longer distances can not be covered by air taxis.

2.3 Parameters

For each of the use cases and for every region we consider the same five parameters. Starting from a reasonable default value, we vary their values in a certain range for estimating their impact on the ODAM market size. The parameters can be classified in two categories: technical and operational. The former include the air taxi cruise speed and the air taxi usable range (excluding reserves). The latter include a parameter which restricts the set of usable airports, a time offset for every ODAM operation and the possible use of an alternate airport.

We derive the set of usable airports based on the number of aircraft starting and landing at them, assuming that it is unlikely that air taxis can be operated at airports with too much traffic. As a base case, we assume that it is feasible to operate air taxis at airports with at most one start or landing of an aircraft every five minutes. This would allow to start or land an air taxi between two narrowbody aircraft, considering their wake turbulence [1]. As we are interested in the impact this assumption has on the potential air taxi market, we vary this parameter from two to ten minutes.

Next, we consider the possibility of using an alternate airport if the original airport is too busy. E.g., it is unlikely that Paris Charle de Gaulle airport (CDG) can be used by air taxis. It might thus be attractive to operate air taxis from or to Le Bourget Airport (LBG) instead. In this particular case, the alternate airport is even closer to the city center than the original one. As this is not always the case, we assume that using an alternate airport increases the travel time by the time required to reach it from the original airport by car. This parameter is a binary one and can be set to true or false.

The third parameter we consider is the difference between the total travel time and the time spent flying in the air taxi which we denote the time offset. It is comprised of the time required for getting to the airport, the time spent at the airport before take-off, and the symmetric times at the destination side. In the case of conventional aviation, there is some research which estimates these times to lie around four hours on average [16, 17]. We assume that this time offset is lower when using air taxis, as we assume that passenger process times will be smaller for ODAM compared to conventional flights due to lower passenger numbers. We also assume that it will be possible to arrive later at the airport, as the risk of missing an on-demand flight does not exist as it does on normal flights — the passengers do not wait for their flight, the flight rather waits for the passengers. Finally, we assume that no baggage drop will be required when travelling with an air taxi. Thus, we assume that the time offset will be smaller for air taxis than for conventional air travel. As a base case, we use a time offset

Table 1 – Parameters and Value Ranges

Parameter	**Unit**	**Default Value**	**Range** *min*	*max*	**Steps**
Air Taxi Speed	km/h	300	100	500	50
Air Taxi Range	km	500	100	800	100
Airport Traffic	minutes between flights	5	2	10	1
Time Offset	minutes	180	90	240	30
Alternate Airport	boolean	False	False	True	—

of three hours. In order to estimate the impact of this parameter, we vary it in steps of 30 minutes between 90 and 240 minutes.

The fourth parameter is the usable range of the air taxis. We use 500 km as the base case, as this is a range which fits wihtin the range of different concepts like Lilium [11], Airflow [2] or Electra [6]. We vary this parameter between 100 km and 800 km in steps of 100 km in order to estimate the impact of it on the potential ODAM market.

The fifth parameter is the speed of the air taxi. Here, we consider a base case of 300 km/h, and vary it between 100 km/h and 500 km/h in steps of 50 km/h.

For reasons of complexity, only one parameter is varied at a time, while the remaining parameters are set to their default value. Variation of different parameter combinations is not covered.

Table 1 summarizes the parameters, their default values as well as the variation ranges and the step sizes.

2.4 Assumptions and Boundary Conditions

In general, we assume that using an air taxi is an attractive alternative if it is faster than travelling by car or scheduled flight. Otherwise the connection and thus the number of passengers on this route is not included in the estimation of the potential ODAM market size. The travel times for scheduled flights are taken from Sabre MI while the car travel times are computed using GraphHopper [9].

Although we do not make many assumptions on the type of aircraft used as air taxi, we assume that it will be a fixed-wing configuration, as this is more efficient for longer flight distances.

As we expect that these air taxis will perform VFR flight, it is likely that they will operate on rather low altitudes. Hence, we neglect the time required for acceleration, climb and descent when estimating the total flight time. The flight time thus equals the great circle distance between origin and destination airport, divided by the air taxi speed.

An upper limit of 800 km has been set for the usable air taxi range. Longer distances are not assumed to be realistic due to performance limits of the air taxis. However, no lower limit is set for the range because of possible routes that are quite short but still make sense to be included in our approach, for example due to topographical conditions (e.g. islands or mountains).

The operating hours are assumed to be 16 hours per day at each airport unless the schedule data contains flights on more hours. Combined with the frequency of flights, the operating hours result in the maximum number of flights per day at an airport, for which connections to and from the airport are still taken into account.

All flights which we consider for our use cases must have both their origin and destination airport within the same of the four regions (China, Europe, India and the US). This is to avoid legal issues and because it is assumed that ODAM markets tend to be more regionally. This does not mean that itinerary flights have to have their first and last airport in the same region.

From a legal point of view, the selected routes are allowed to be served by a potential ODAM-system. These routes are also flyable from both an air taxi performance view and an environmental condition

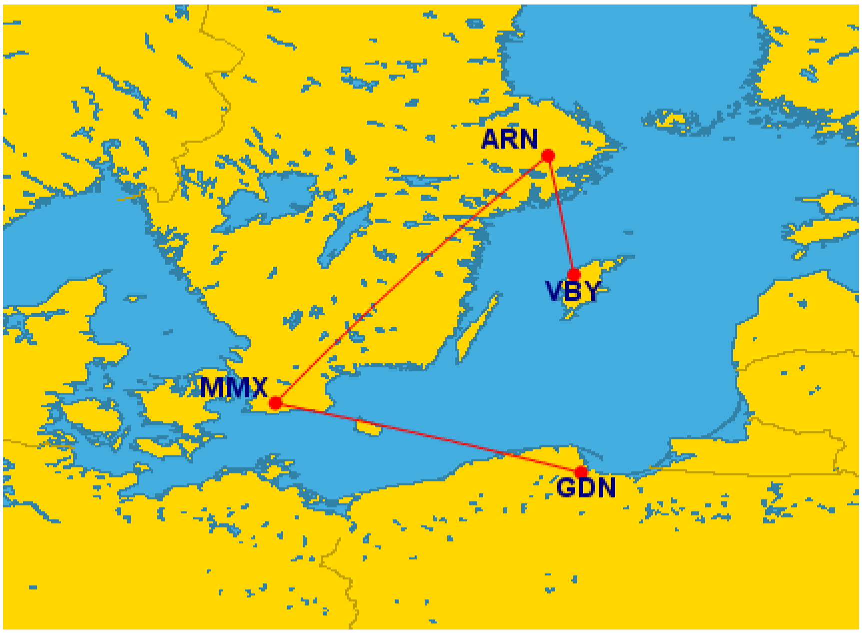

Figure 1 – Example Routes: MMX-GDN and MMX-ARN-VBY [21]

perspective. The same applies to the use of the airports.

2.5 Computation of Demand Figures

In this section we describe how the demand figures were estimated based on a given set of parameters. First, we compute a set of origin-destination airport pairs between which air taxi operations might be relevant. We will discuss this on the example of Malmö (MMX), and connections as shown in Figure 1. The first example is the connection from Malmö to Gdansk (GDN). On this connection, there are direct flights, but the frequency is rather low, implying a high schedule delay. Thus, this origin-destination-pair is relevant for the first use case, in which existing direct connections are complemented or even replaced by air taxis.

The second example is the connection from Malmö to Visby via Stockholm-Arlanda (MMX - ARN - VBY). There are direct connections between Malmö and Visby, but as their frequency is very low, passengers also travelled via Stockholm. Thus, this fits our second use case in which a direct ODAM connection is offered to passengers who otherwise took a multi-stop flight.

Our third use case is concerned with feeder flights. In this example, all passengers travelling from Malmö via Stockholm-Arlanda to another airport might fit this use case.

For each of the three use cases, we check if it is feasible to transport the respective passengers via air taxi, given a set of parameters.

The set of parameters used in the further filtering process contains range, speed, a time offset, the set of airports which can be used and the possible use of an alternate airport, as detailed in Section 2.3. First, we simply remove all connections for which the given range is insufficient. Next, we check the origin and destination airports. If they are so busy that air taxi operations seem unfeasible, we consider two cases. If the parameter for allowing alternate airports is "True", we replace airports which are too busy by alternate airports, otherwise these origin-destination-pairs are removed. Next, we check if travelling via air taxi is actually faster than driving by car, or taking a direct flight when considering the schedule delay. In this way, a set of origin-destination pairs is computed which is feasible to be operated via air taxi with the given set of parameters, and for which air taxi is the fastest travel mode. Varying these parameters allows us to estimate the impact of each of them.

3. Results

The numbers presented below show the number of passengers and total fare in USD for the respective regions and use cases in 2019, taking into account the different parameter values. In the first use case, these are passengers who travelled taking a direct flight which might be complemented by

Table 2 – Results for the base parameter settings. PAX given in thousand passengers per year. Fare is given in Million USD

Use Case	**China**		**Europe**		**India**		**US**	
	PAX	*Fare*	*PAX*	*Fare*	*PAX*	*Fare*	*PAX*	*Fare*
Complement Direct Flights	1129.0	82.4	3137.2	180.1	1038.6	48.4	257.9	31.8
Replace Multi-Stop Conn.	24.6	1.9	1220.7	221.5	44.5	3.3	1008.1	186.2
Substitute Feeder Flights	55.4	2.8	2386.0	181.3	437.0	14.7	870.6	71.7
Σ	1209	87.1	6743.8	582.9	1520.0	66.4	2136.6	289.7

an air taxi flight, as this is technically and operationally feasible with respect to the given parameter settings. Furthermore, considering schedule delay and ground times, the ODAM operation would reduce the overall travel time. The second case shows the number of passengers travelling on an itinerary which is not a direct flight, and where origin and destination might be connected with an air taxi. The third case shows the number of passengers on short feeder flights, again on connections where substituting the regular flight by an ODAM operation is operationally and technically feasible.

For each connection which is included in the resulting numbers for the first use case, the air taxi is faster than a trip by car or a scheduled flight. For the other two use cases, air taxi must be faster than car travel times. This is because the overall travel time for multi-stop itineraries cannot be derived exactly from the Sabre MI database. However, since a direct connection is always assumed to be faster than a multi-stop flight over the distances we consider, and feeder flights often imply long travel times for comparatively short flights, this approach is considered plausible.
Next, we begin with a discussion of the results of our analysis for the base case, considering both the number of potential passengers and the fare these passengers paid for air travel. Afterwards, we discuss the impact of each of the parameters on the potential passenger market size.

3.1 Overview

Table 2 provides an overview of the market sizes for the different use cases in the regions we considered, both in terms of passengers transported and fares paid. Here, default settings were used: A maximum range of 500 km, an air taxi speed of 300 km/h, at most 192 flights per day on each airport involved, and a time offset of 3 hours. Thus, the travel time with an air taxi was estimated as great circle distance divided by the air taxi speed, plus the time offset. We did not allow the usage of alternate airports here.
As it can be seen, Europe offers the largest potential market for every use case, both from the number of passengers and the total fares. Thus, the overall largest potential market can be located here. Looking at the passenger numbers and total fares depending on the use cases, the differences are very high in the other regions compared to Europe. In China and India, this difference is partly enormous as the use case of replacing multi-stop connections is almost irrelevant. One reason could be that there are significantly fewer multi-stop connections than in Europe or the US. In general, the total figures in China and India are significantly lower than in Europe and the US. India also has the lowest revenue per passenger, at around 44 USD/PAX. At approximately 136 USD/PAX this number is largest in the US. Moreover, the US is the only region where replacing multi-stop connections forms the largest potential market both from a passenger and a total fares perspective. Although the largest market in terms of total fares in Europe is identified for the second use case, too, the highest passenger number is estimated for complementing direct flights, which is also the case for China and India. This might be the case because low-demand routes in the US are operated with smaller aircraft at a higher frequency compared to Europe [7].

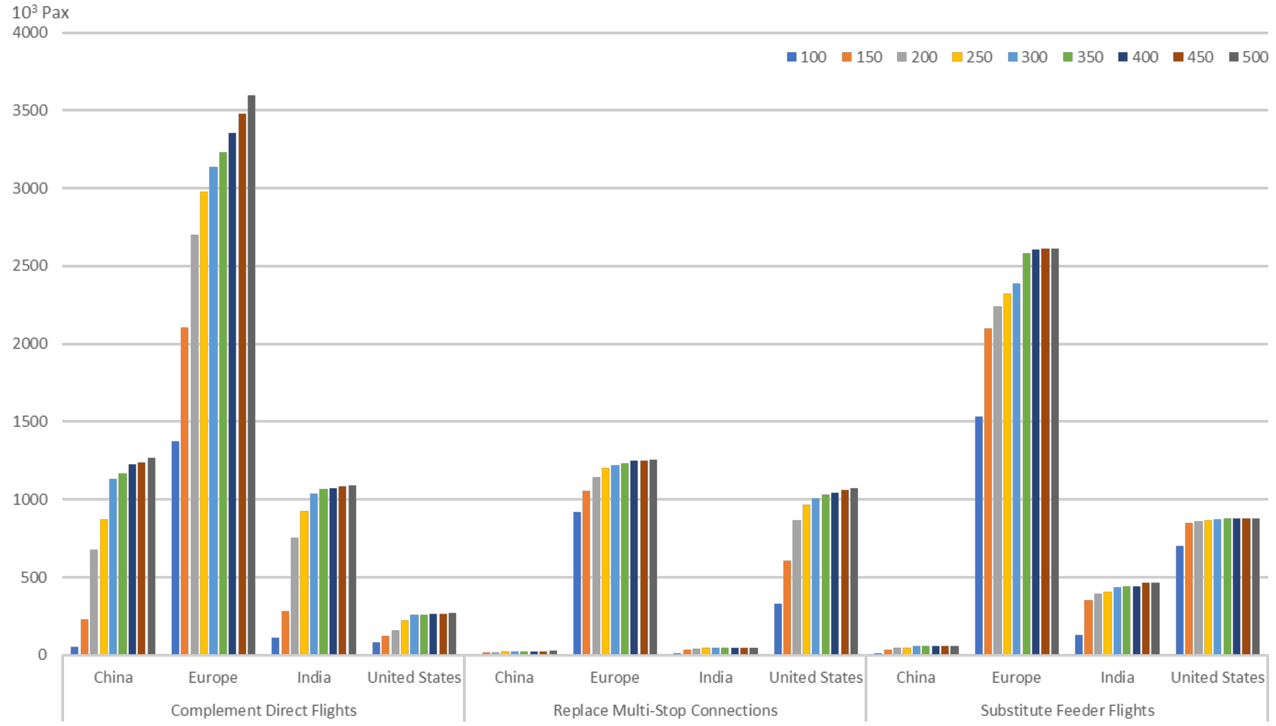

Figure 2 – Impact of the parameter Air Taxi Speed: 10^3 passengers who might choose ODAM as preferred mode of travel, depending on the air taxi speed

3.2 Air Taxi Speed

First, we consider the impact of the speed of the air taxi. We thus vary the speed between 100 km/h and 500 km/h in steps of 50 km/h. Figure 2 shows the results of this analysis separated by use and region. It can be seen that increasing the speed from 100 km/h up to 200 km/h significantly increases the number of passengers for who air taxis become the fastest travel mode for nearly every use case in every region. In China, increasing the speed from 100 km/h to 200 km/h increases the number of potential passengers from 49.700 to 675.000 passengers for which taking an air taxi would be faster than a direct flight, including its schedule delay.

At higher air taxi speed values, the potential passenger demand plateaus at approximately 300 km/h, in some regions rather at 350 km/h, and further increases in the air taxi speed do not produce significant increases in passenger demand. This could be the case because the considered distances with a maximum of 500 km are not long enough for a further increase in speed to provide a benefit. Interestingly, this analysis shows that air taxis which fly on demand would be attractive in some use cases and regions if they would fly at only 100 km/h. Presumably this shows passenger demand in regions where traveling by car is not an attractive alternative.

3.3 Air Taxi Range

Next, we consider the impact of the usable range of air taxis. It is important to note that this range does not equal the range an air taxi can reach from a technical perspective. We rather consider the maximum distance between airports such that an air taxi can be operated between them, having sufficient reserves for a potential rerouting to another airport.

Again, we keep all other parameters at their default value and consider the impact of varying the usable range.

It is not surprising that an increased range allows for operating on larger sets of origin-destination pairs, and thus increases the potential passenger demand which is shwon in Figure 3. Still, it can be seen that the impact of this parameter on the potential passenger demand is quite large, also for larger values of this parameter. This might imply that there is a relevant set of origin-destination pairs between which a significant demand for air travel exists, and ODAM might be attractive as the

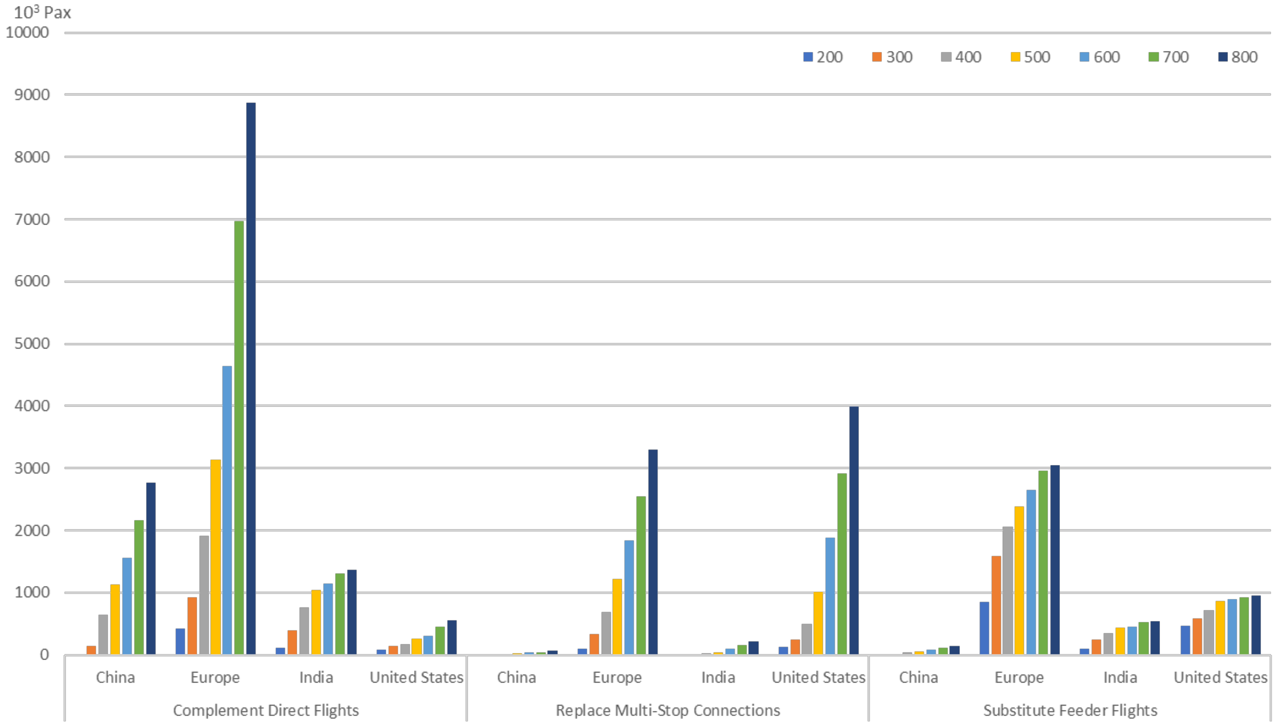

Figure 3 – Impact of the parameter Air Taxi Range: 10^3 passengers who might choose ODAM as preferred mode of travel, depending on the air taxi range

schedule delay is large. In the use case where multi-stop connections are replaced, the relative increase in the number of potential passengers is significantly larger than in the case of complementing existing direct connections. In the case of feeder flights, the impact of an increased range is not as pronounced, presumably as feeder flights tend to cover a limited distance as they usually connect the origin airport with a hub relatively close to it, and vice versa.

3.4 Usable Airports

The third parameter we consider is the choice of available airports. We assume that air taxis will not be allowed to operate from airports which are very busy already, and model this by using only airports with a number of daily operations below a certain threshold. Increasing this threshold allows connections to and from larger airports. Interestingly, the impact of this parameter varies significantly between regions and use cases. When complementing direct flights in China, there is a threshold of 240 flights per day at which the potential passenger demand increases significantly, while this parameter had hardly any impact on smaller values, as can be seen in Figure 4. A similar behaviour, yet at another threshold value, can be observed for the use case of substituting feeder flights, in China, India and the United States. The absence of this effect for the use case of replacing multi-stop connections might be explained by the fact, that multi-stop connections often have their origin and destination at relatively small airports already. In summary, it can be noted that this parameter has a massive impact on the potential passenger demand.

3.5 Time Offset

The total travel time when travelling via aircraft or air taxi consists of the time actually flying, and a time overhead. This is the time required to get to the airport, time spent at the airport before the flight starts, and symmetric times at the destination. As a base case, we estimated this time offset to equal 3 hours. It can easily be seen that this has a massive impact on the overall travel time: In our base parameters, we assume a range of 500 km and a travel speed of 300 km/h. Assuming that the whole flight was performed with maximum speed, this yields 1 hour and 40 minutes flight time. Thus, the larger part of the travel time is spent on the ground and therefore massively impacts the overall travel

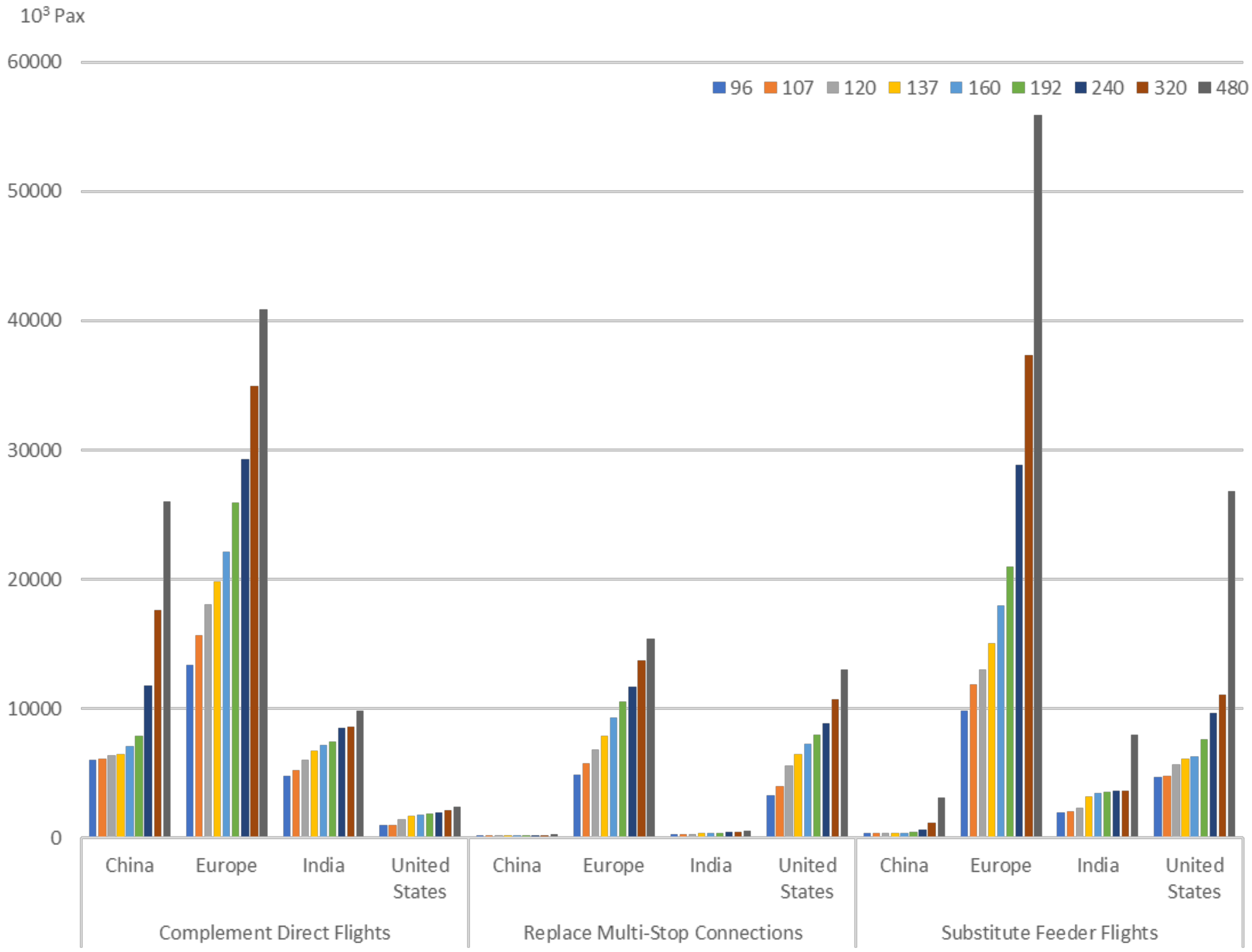

Figure 4 – Impact of the parameter Usable Airports: 10^3 passengers who might choose ODAM as preferred mode of travel, depending on the restrictions on the set of airports

time.

Figure 5 shows the impact of variations of the value of this parameter. It can clearly be seen that the impact differs between the use cases. In the case of complementing direct connections, the air taxi is chosen as preferred travel mode when it is faster than both taking a regular flight (including schedule delay) and travelling by car. Hence, reducing the assumed time offset has a massive impact on the estimated demand in this use case. This is consistent with findings from other studies [13, 15, 12].

In the case of replacing multi-stop connections, the impact is not as pronounced. There is no significant difference at the potential passenger demand when varying time offset. A possible explanation might be that the fact that passengers booked a connecting flight on relatively short origin-destination-pairs already implies that there is no attractive way of travelling by car, and air taxis therefore provide a convenient way of travelling even with large time offsets.

3.6 Alternate Airports

The last parameter we analyse is the option of using alternate airports. This is relevant if the origin and/or destination airport are too busy to operate air taxis from it. Figure 6 shows the impact of this parameter. In this analysis, we estimated the travel time when using an alternate airport by adding the time required by car from the original airport to the alternate airport. Thus, the estimation for the travel time might be rather conservative in this case.

Allowing the use of alternate airports has a massive impact on the potential demand for complementing direct flights, especially in China. This makes sense as it was shown in Section 3.4 that the potential demand in this case was limited by the fact that many airports are too busy for operating air taxis on them. Thus, alternate airports appear attractive here. For other use cases, the impact of this

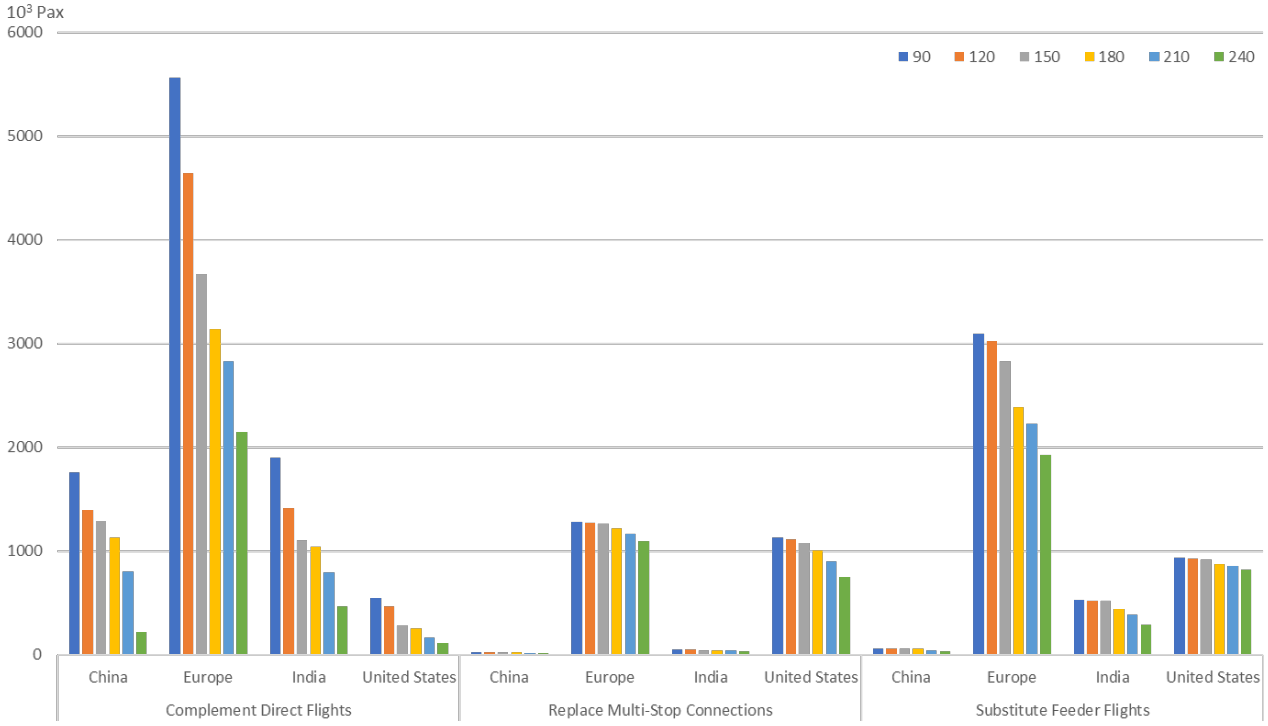

Figure 5 – Impact of the parameter Time Offset: 10^3 passengers who might choose ODAM as preferred mode of travel, depending on the time offset for an ODAM operation

parameter is smaller. In the case of substituting feeder flights, this makes sense as they are used for transporting passengers to larger airports, where they can reach a connecting flights. As we allow alternate airports only at the start or end of the journey, this parameter does not help here.

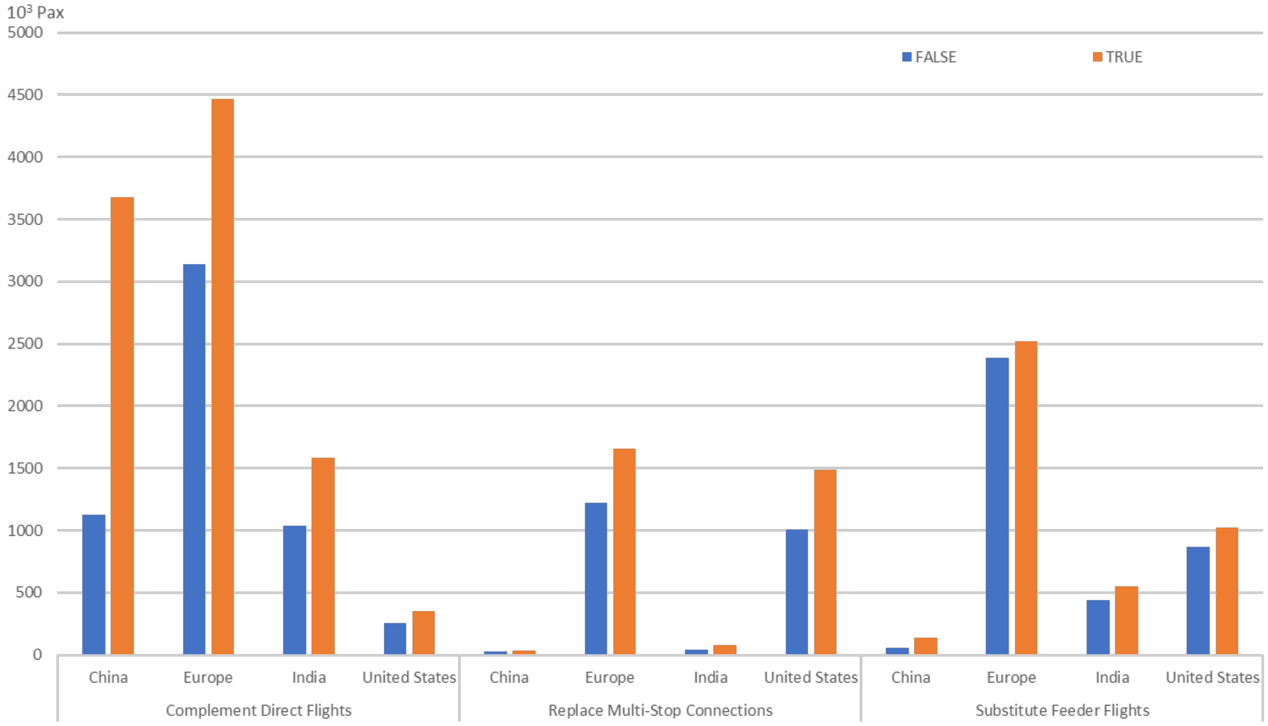

Figure 6 – Impact of the possibility of using alternate airports at start and destination: 10^3 passengers who might choose ODAM as preferred mode of travel, depending on this parameter

4. Conclusion and Outlook

In this paper, we presented an approach which allows us to estimate the potential passenger demand for on-demand inter-city air mobility for different use cases, and for different regions of the world. While it does not consider as many details as other publications, it allows for estimating the demand for different large-scale regions worldwide. Furthermore, we could analyse the impact of five different parameters on the potential market size. The results from this might be helpful in further analyses, in which the market might be analysed in more detail. However, we did not analyse if this market size would be sufficient to sustainably run an ODAM network in a particular region.

The first use case, in which direct flights are operated via ODAM to complement or even replace scheduled flights, might attract more than 3 million passengers per year only in Europe (out of 500 million passenger on direct connections in 2019), even when assuming rather conservative technical parameters like a speed of 300 km/h, and 500 km range. In contrast, the use case in which ODAM directly operates between airports which are primarily connected by multi-stop connections, would attract only 25.000 passengers in China, which rather likely is not sufficient for an economically sustainable operation. There are large differences between the different regions and the three uses cases. Especially interesting is that in the US the replacement of multi-stop connections and the substitution of feeder flights accounts for the most potential ODAM passengers, in contrast to the other regions. Further research might analyse reasons for this, e.g. a different network structure. Regarding the fares a further step could be to account for different purchasing powers in the different regions. Still, at which amount of passengers the operation becomes sustainable depends on the way an operator would organise its network.

Furthermore, we assumed that that the main value proposition of ODAM is the reduction of travel time, and passengers thus choose it over another mode of travel if it satisfies this proposition by providing shorter travel times. Thus, operators will need to find a way to offer short travel times, especially in terms of the time offset, while still reaching a sufficient seat load factor. Considering the impact of the range of the air taxis, our analysis depends on the assumption that travel time is more relevant for the passenger preferences than comfort. Still, it is not clear if passengers would like to travel for more than 2 hours in an air taxi. The time spent flying did not show a large impact on the passenger demand in our analysis. This may be reasonable as we only considered flights covering a distance of 500 km as the base case and at most 800 km in the analysis of this parameter. Still, it might be interesting to analyse the impact of combinations of parameters, e.g. if speed becomes more relevant on larger distances. Furthermore, this factor might be much more relevant from the operator's perspective. A faster air taxi would be able to transport more passengers each day, thus reducing operating costs.

A final thought is the impact that operating air taxis in the presented use cases would have on conventional air travel. In the case of complementing direct flights, air taxis might attract the passengers with the highest willingness to pay. On some routes, this might turn conventional flights unprofitable.

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6. Copyright Statement

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