

Case study Riga

Vertical flight efficiency during climb and descent

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24/07/2018

1 Introduction

1.1 General

This document provides results on vertical flight efficiency for Riga as calculated by the Performance Review Unit of EUROCONTROL. More information on the methodology can be found on the [PRU website](#).

First, the results for the top 30 airports in Europe during 2017 are presented, allowing a comparison between the results of Riga and the rest of the top airports. Afterwards, the results for Riga are presented up to the last available month.

1.2 Acronyms and terminology

Term	Definition
CCO	Continuous climb operations
CDO	Continuous descent operations
FIR	Flight Information Region
PRU	Performance Review Unit

2 Vertical flight efficiency for the top 30 airports in Europe in 2017

Figure 1 and Figure 2 show respectively the average time flown level per flight and median CDO/CCO altitudes for the top 30 airports in Europe with a highlight of the values for Riga.

The average time flown level per flight for Riga is 0.2 minutes during descent (lower than the top 30 average value of 0.5 minutes) and 0.3 minutes during climb (lower than the top 30 average value of 0.5 minutes).

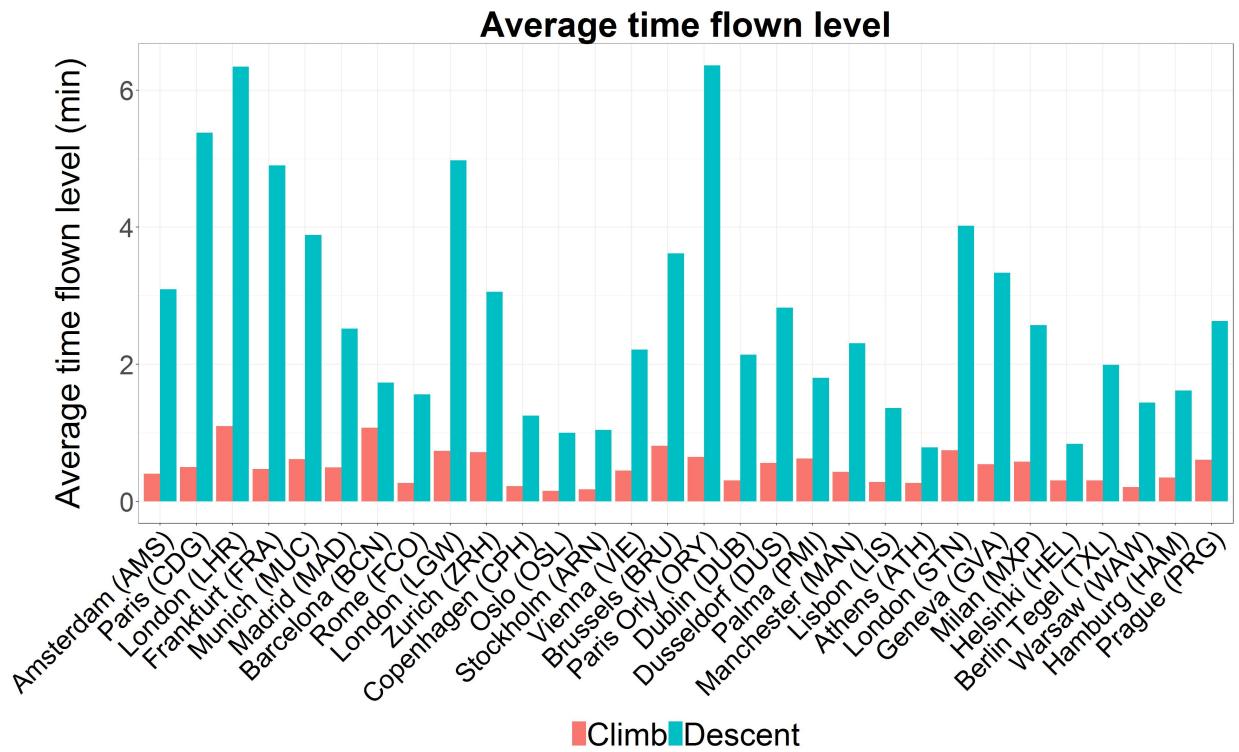


Figure 1: Average time flown level per flight for the top 30 airports in Europe

The median CDO altitude of Riga is 28000 feet while the median CCO altitude is 34000 feet.

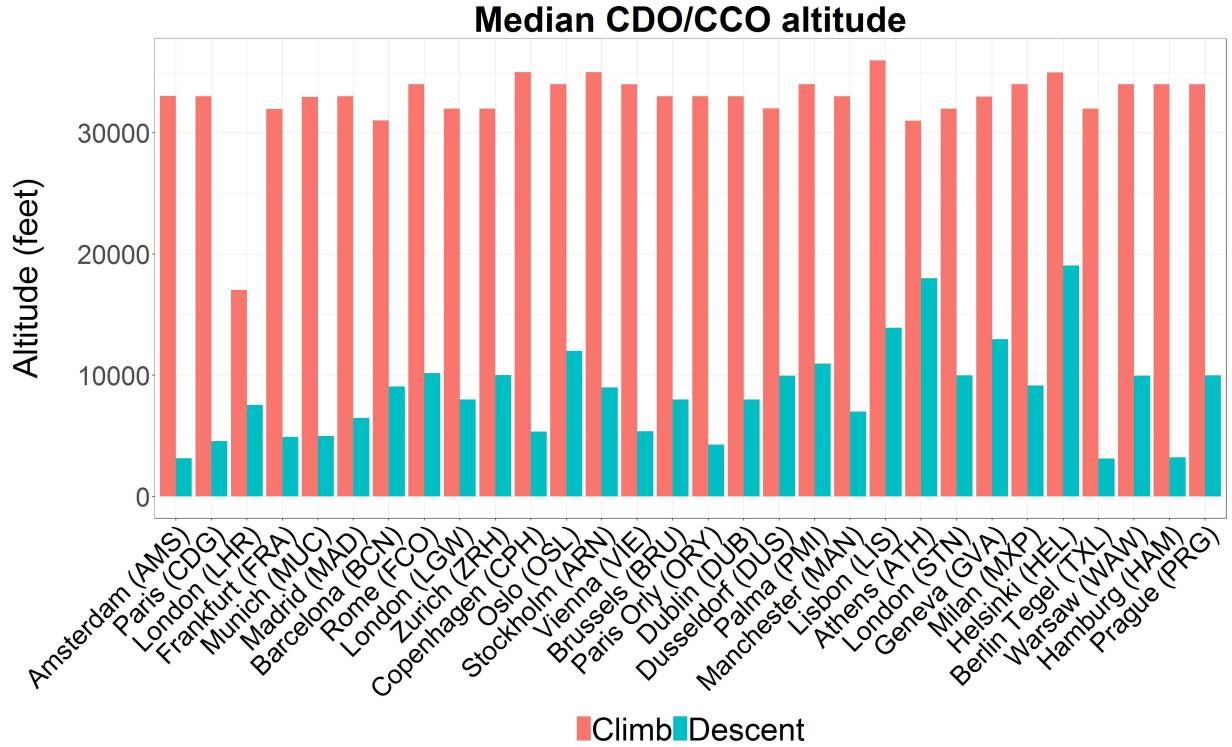


Figure 2: Median CDO/CCO altitudes for the top 30 airports in Europe

Figure 3 shows the median CDO and CCO altitudes with respect to the average time flown level per flight for the corresponding airports in 2017. Circles and triangles respectively indicate the climb and descent values while their colours give an idea about the number of movements on the individual airports. Low average level times and high median CDO/CCO altitudes indicate good vertical flight efficiency so the top left corner of Figure 3 contains the most efficient airports while the lower right corner has the airports with the worst efficiency.

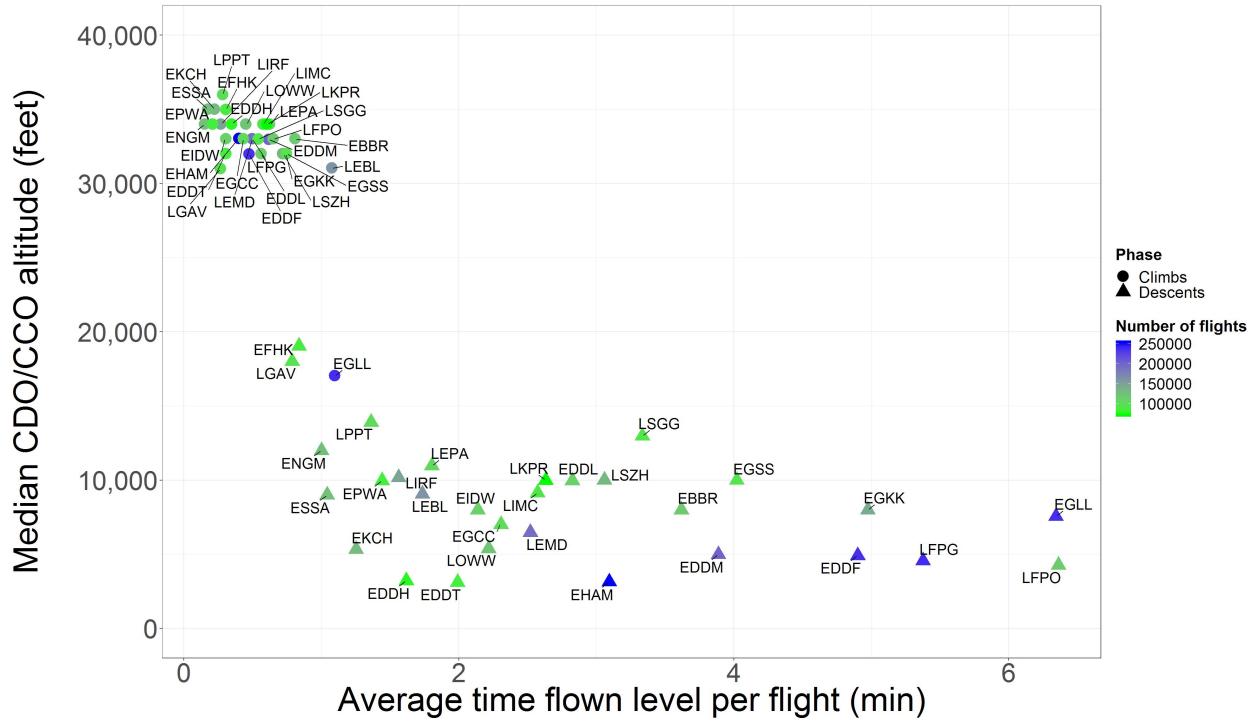


Figure 3: Average time flown level vs. Median CDO/CCO altitudes for the top 30 airports in Europe

Figure 4 presents the share of unimpeded flights. The percentage of CDO flights for Riga is 92.4% which is higher than the overall share for the top 30 airports (30.2%) while the share of CCO flights for Riga is 86.8% which is higher than the overall share for the top 30 airports (74.8%).

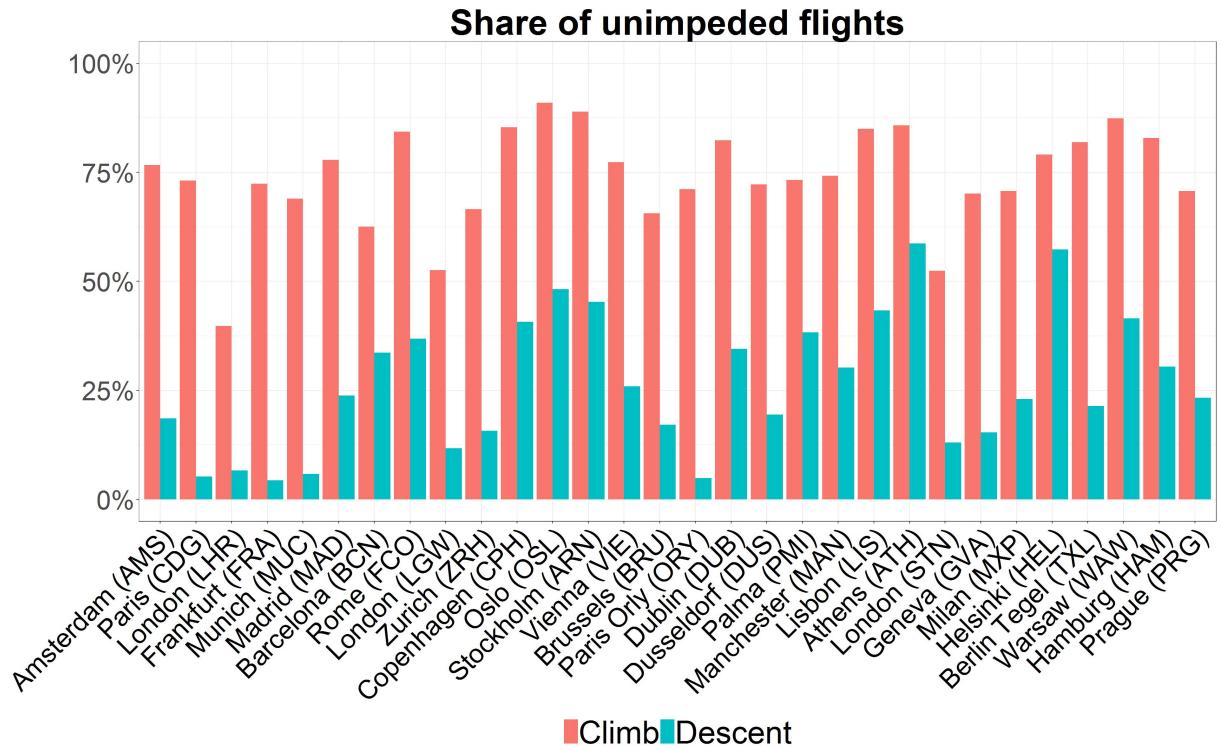


Figure 4: Share of unimpeded flights for the top 30 airports in Europe

Figure 5 and Figure 6 show the total time flown level by altitude bands during respectively descent and climb. The lowest altitude bands ([0,7500) feet for descents and [0,10500) feet for climbs) are chosen as such since at these altitudes not only fuel consumption but also noise has an environmental impact.

For Riga, most level flight is detected in level band [30500,Inf) for the descent and [30500,Inf) for the climb.

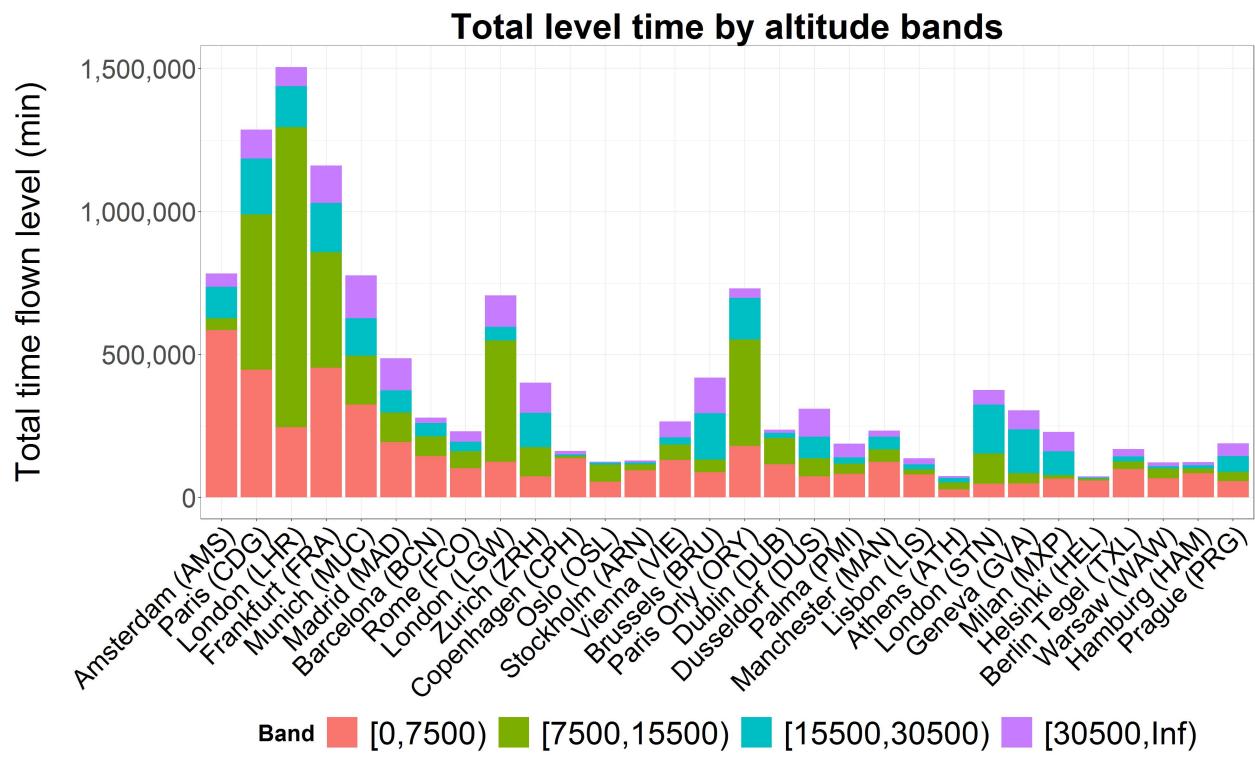


Figure 5: Total time by altitude band for the top 30 airports in Europe (Descent)

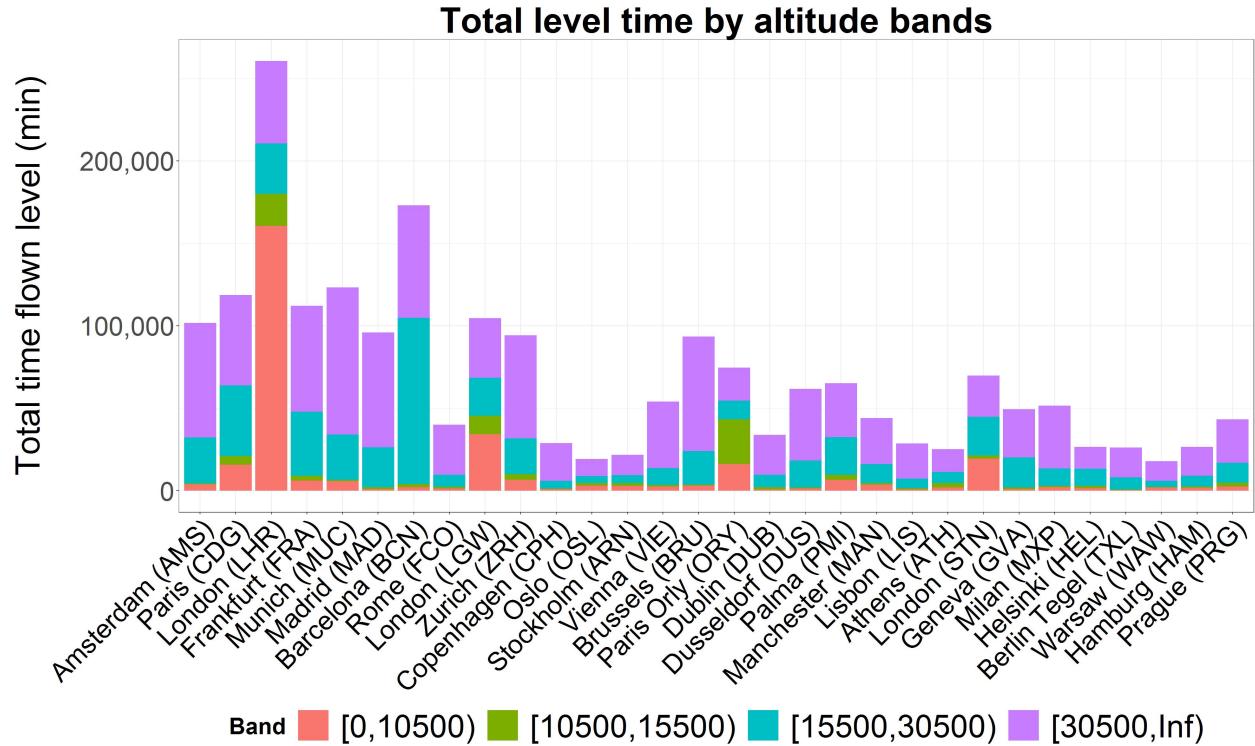


Figure 6: Total time by altitude band for the top 30 airports in Europe (Climb)

3 Situational description

Figure 7 shows the FIR boundaries and main airports in the wide vicinity of Riga.

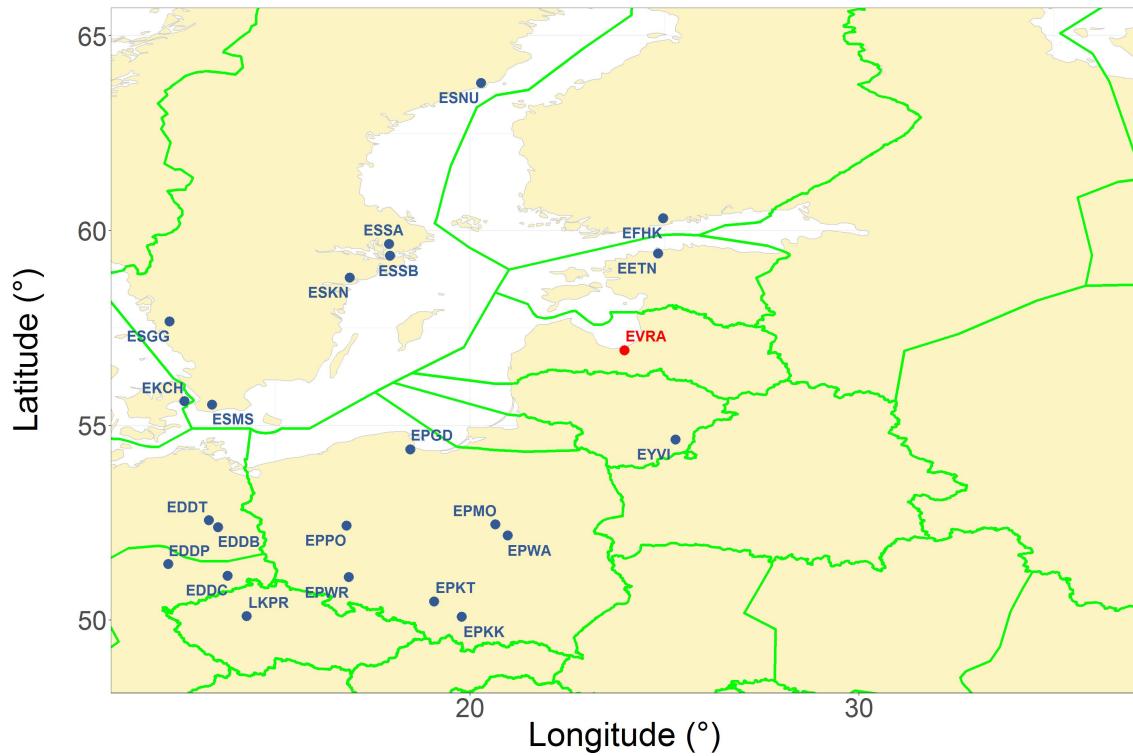


Figure 7: States and main airports around Riga

4 Results for Riga

The evolutions of the average time flown level per flight, median CDO/CCO altitude and share of CDO/CCO flights are shown in respectively Figure 8, Figure 9 and Figure 10.

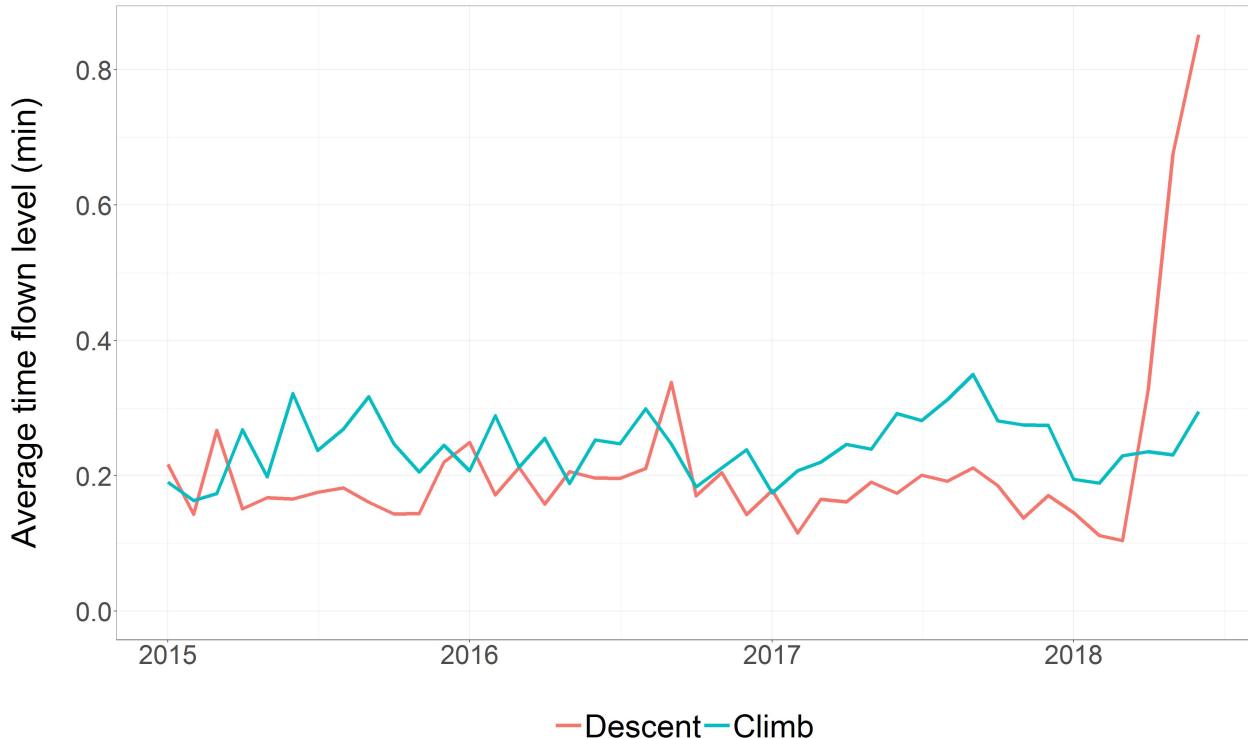


Figure 8: Average time flown level per flight

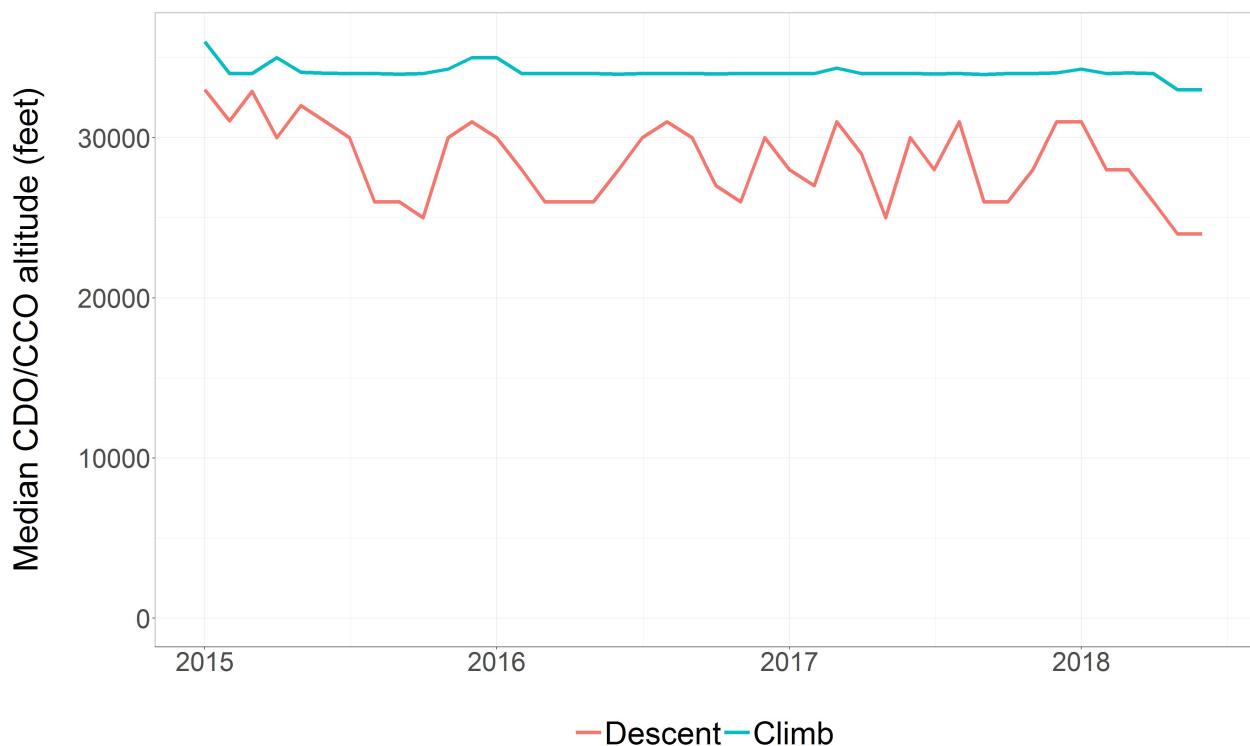


Figure 9: Median CDO/CCO altitude

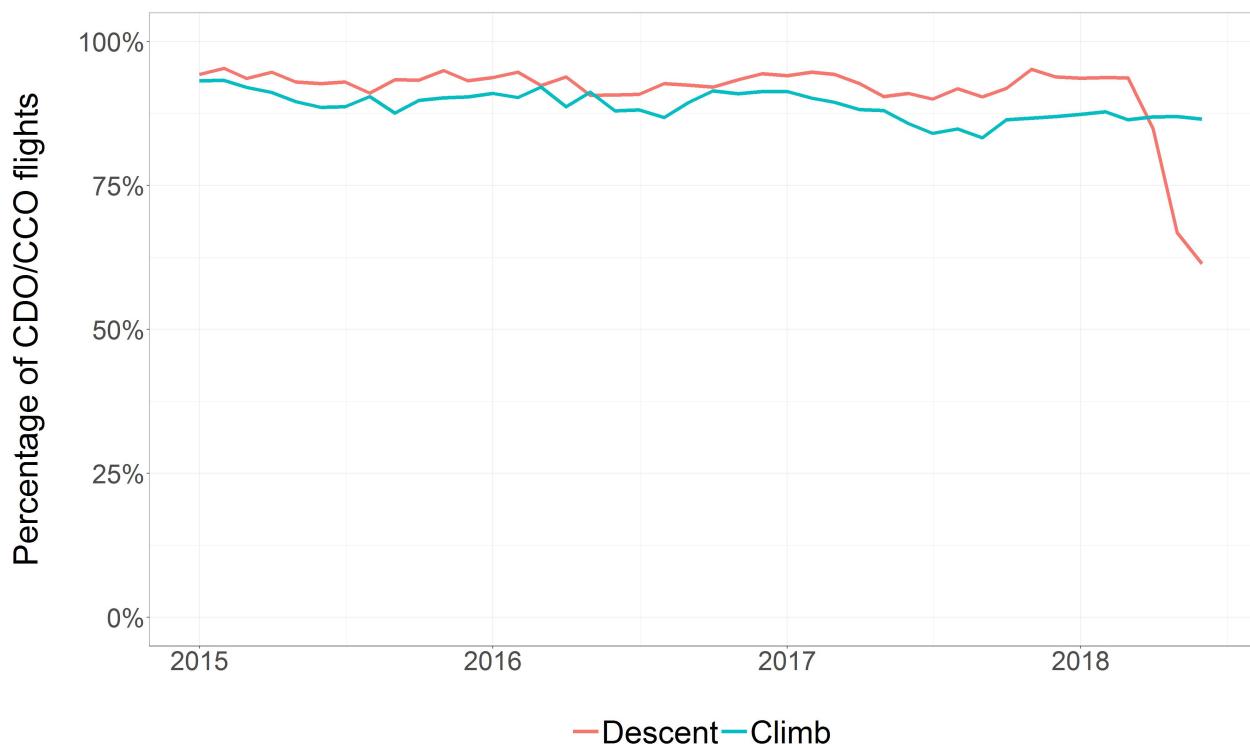


Figure 10: Percentage of CDO/CCO flights

Figure 11 shows the level flight durations by altitude for Riga. Most level flight occurs at [34500,35500) feet during the descent and at [33500,34500) feet during the climb.

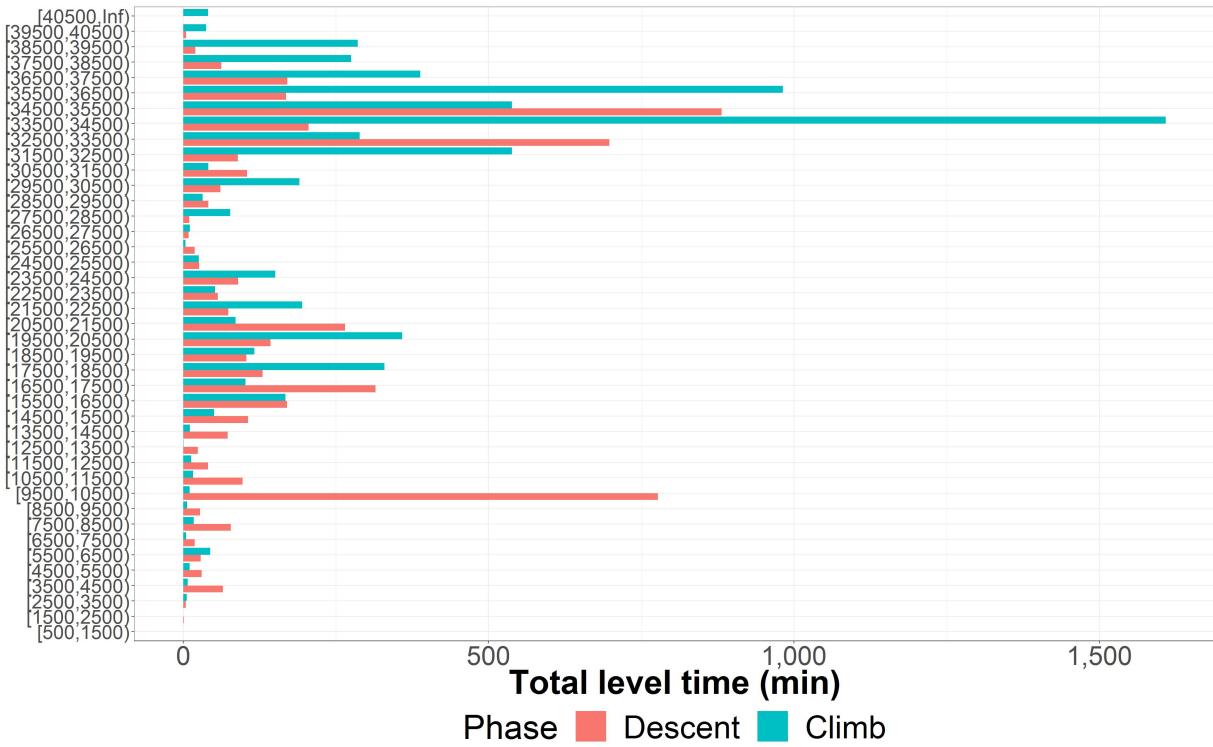


Figure 11: Total level time per altitude band

5 Level segment positions

The figures in this section present the trajectories to/from Riga in June 2018. The trajectories are shown in blue whereas the detected level segments are highlighted in red.

Figure 12 displays the lateral trajectories of arrivals into Riga while Figure 13 and Figure 14 show the vertical trajectories with regard to respectively time and track distance.

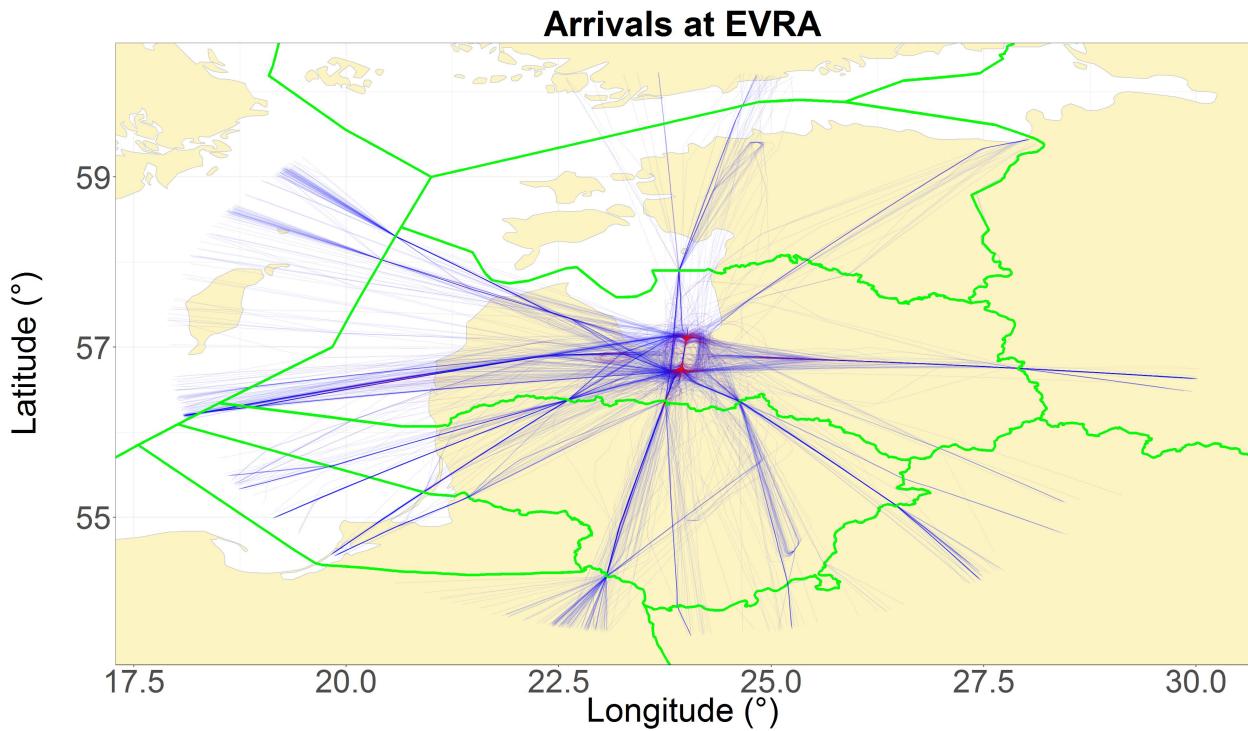


Figure 12: Lateral arrival trajectories

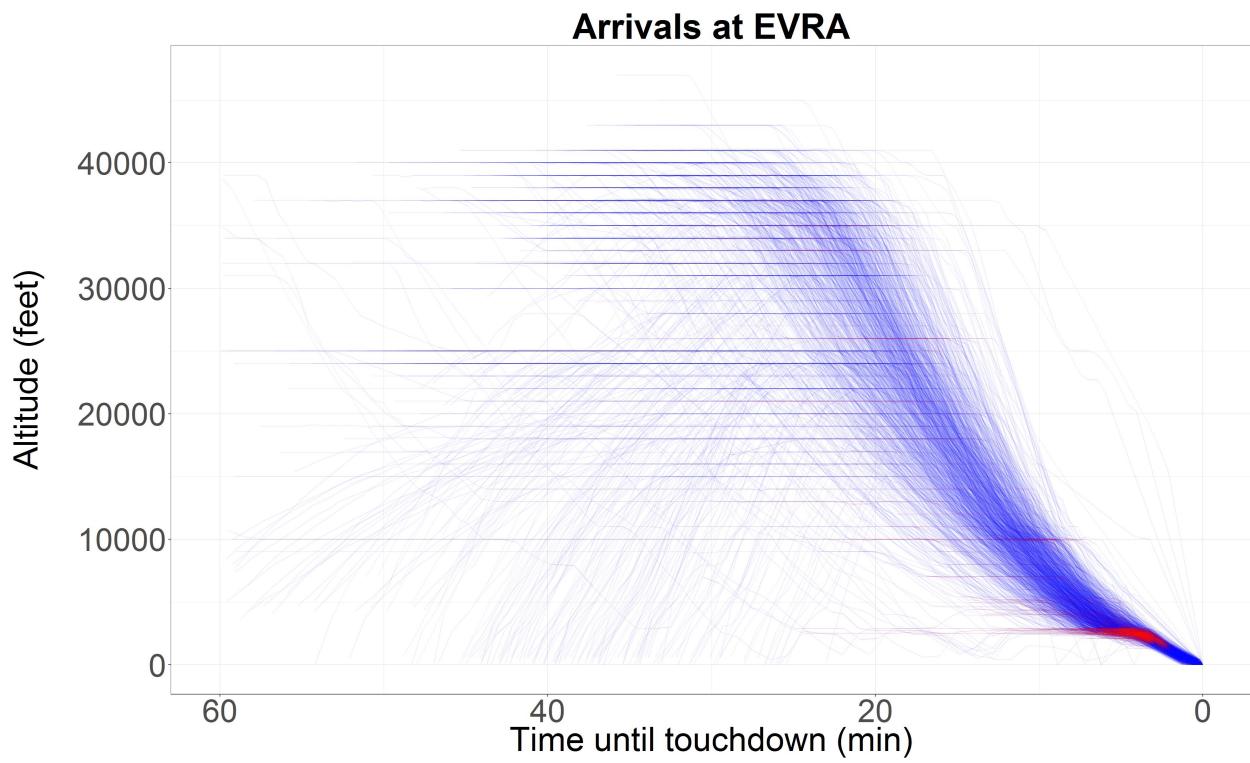


Figure 13: Vertical arrival trajectories with respect to time

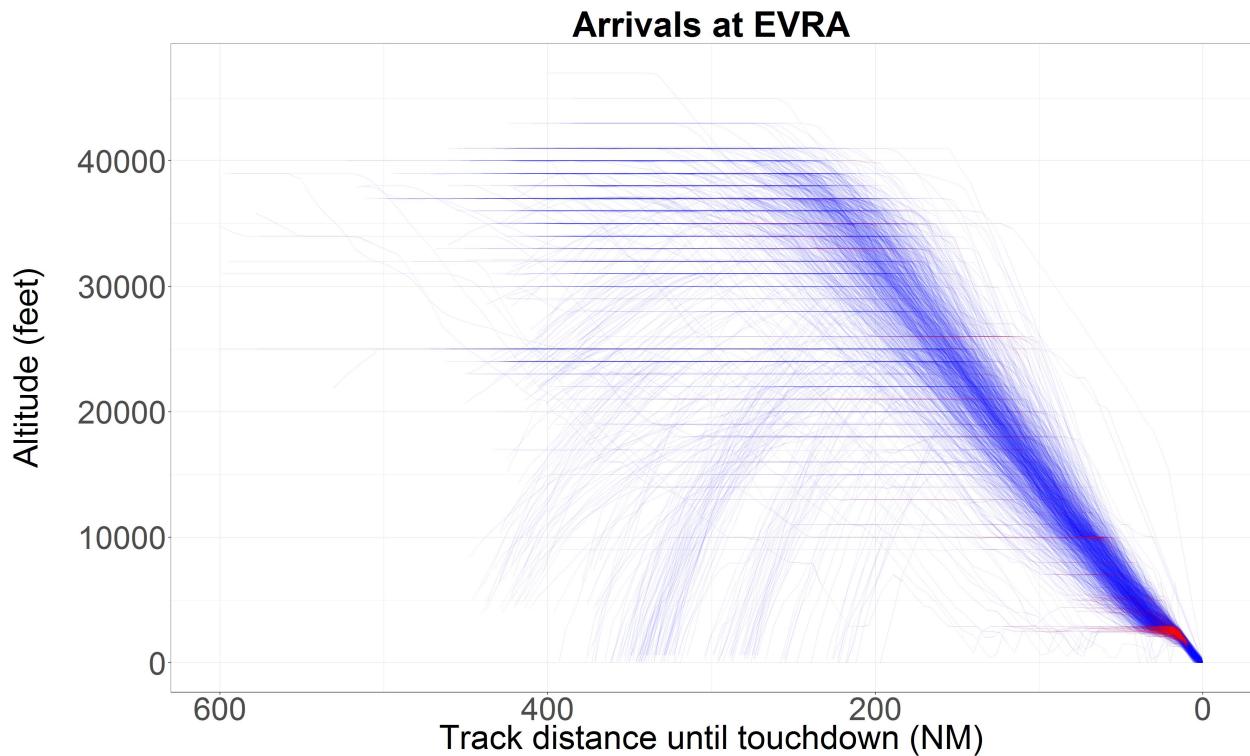


Figure 14: Vertical arrival trajectories with respect to track distance

Figure 15 displays the lateral trajectories of departures from Riga while Figure 16 and Figure 17 show the vertical trajectories with regard to respectively time and track distance.

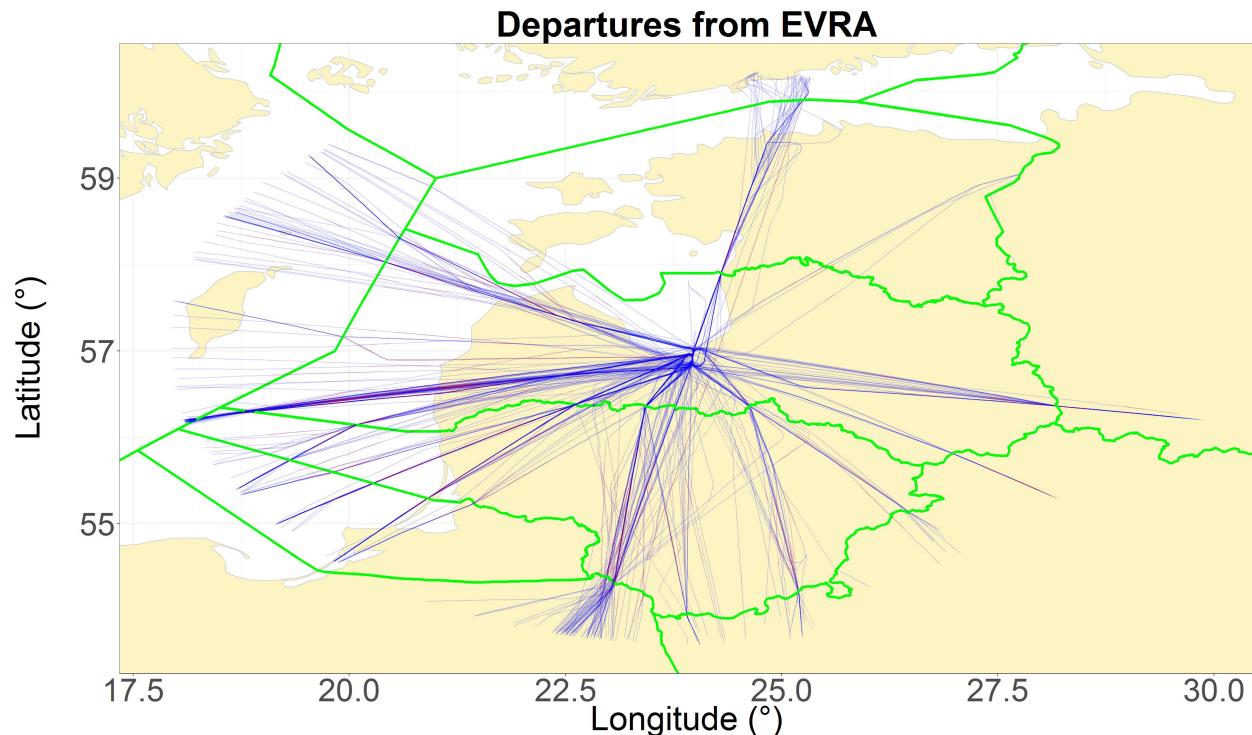


Figure 15: Lateral departure trajectories

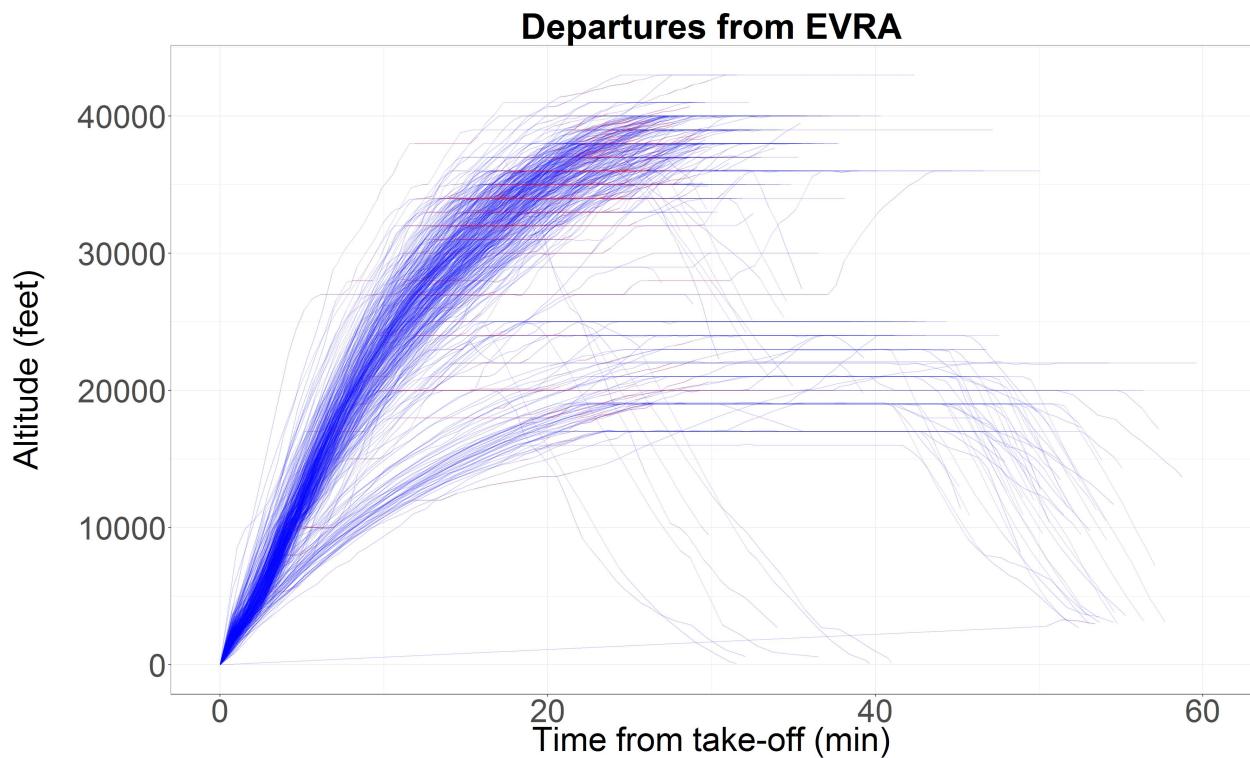


Figure 16: Vertical departure trajectories with respect to time

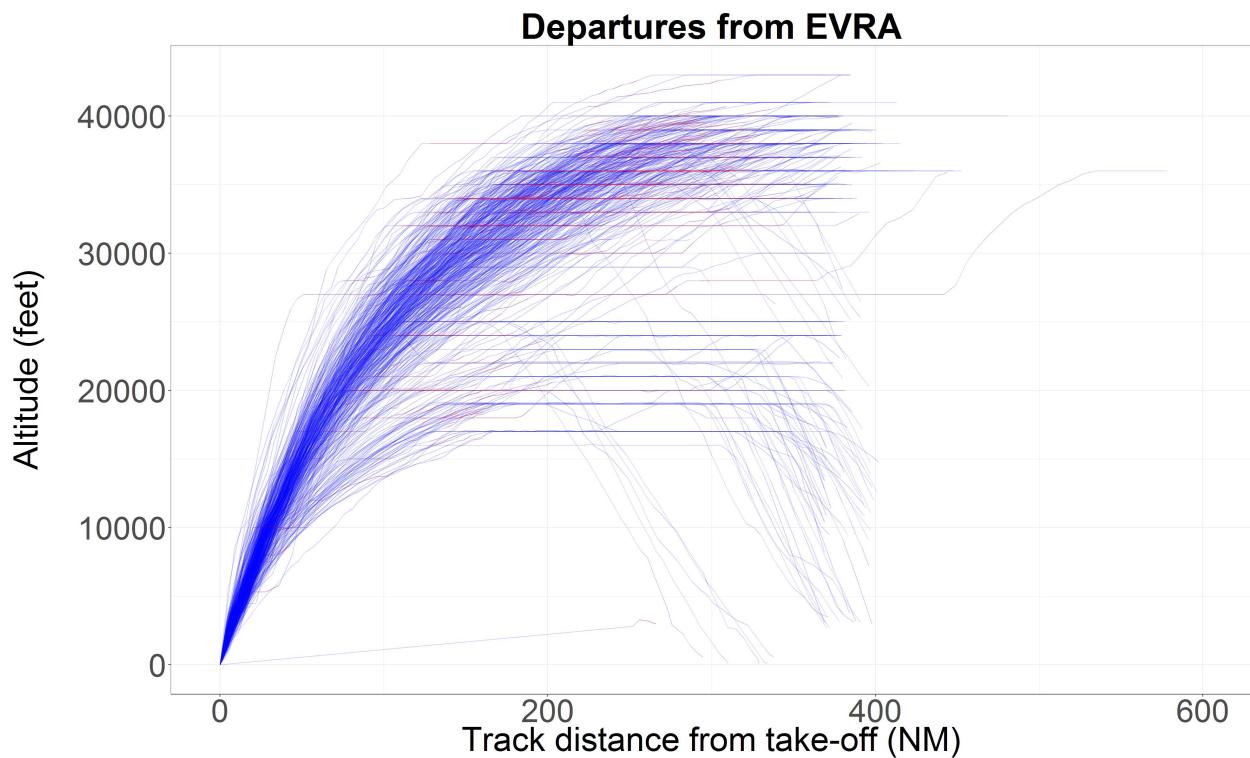


Figure 17: Vertical departure trajectories with respect to track distance

6 Conclusions

Metric	Value
Average time flown level per flight (min)	0.2
Median CDO altitude (feet)	28,000.0
Share of CDO flights (%)	92.4
Average time flown level per flight (min)	0.3
Median CCO altitude (feet)	34,000.0
Share of CCO flights (%)	86.8