

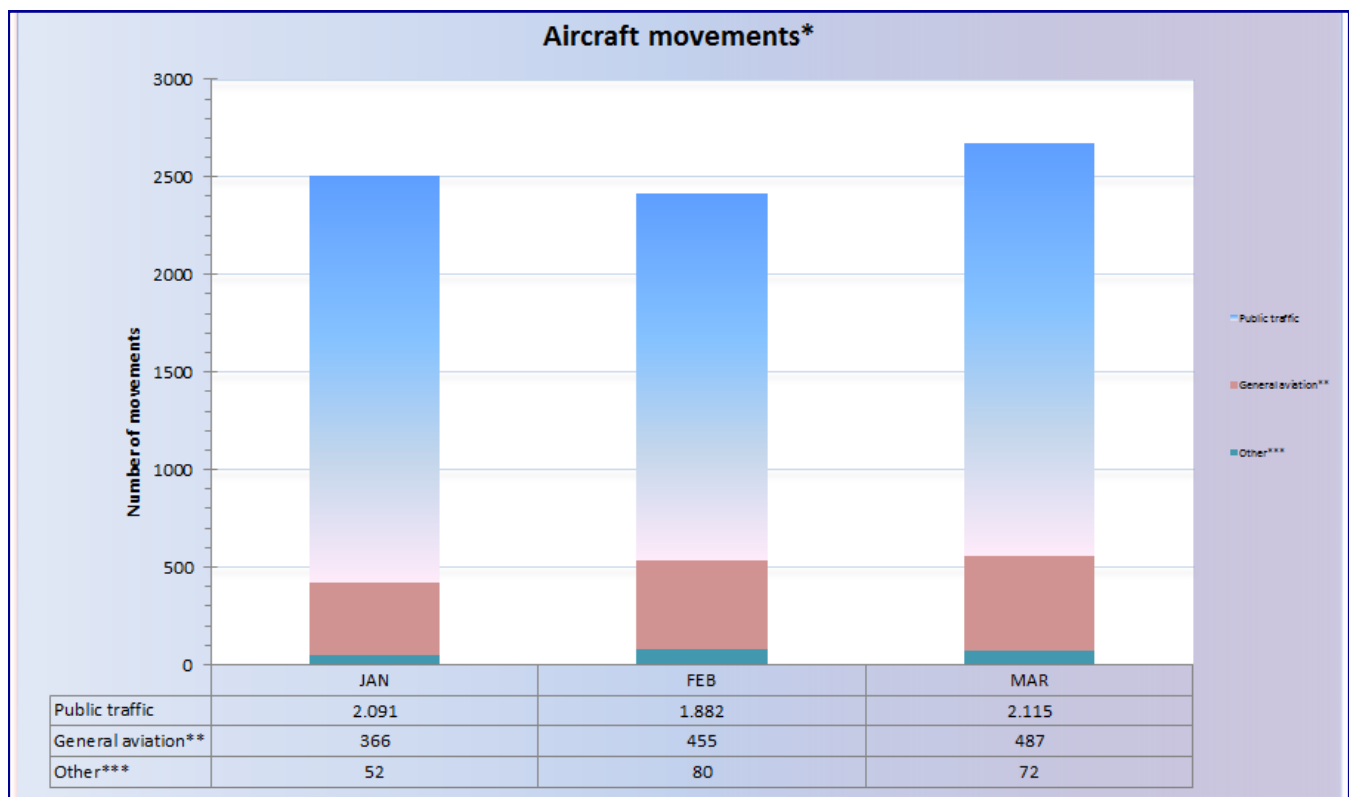
# REPORT ON NOISE MEASUREMENTS

## for the period JANUARY - MARCH 2019

### 1. TRAFFIC FIGURES - aircraft movements

Information on aircraft movements in the period Jan.-Mar. 2019 show a slight increase, compared to the same time period last year. There were 7.600 aircraft movements, which is 3,9% more compared to the same time period last year. The data are:

- 2.509 aircraft movements in January, which is 1,9% more compared to the same time period last year,
- 2.417 aircraft movements in February, which is 9,2% more compared to the same time period last year,
- 2.674 aircraft movements in March, which is 1,4% more compared to the same time period last year.



\* landing or takeoff of aircraft

\*\* commercial, business and private aircrafts and helicopters which have a maximum of 19 seats and do not exceed the weight of 44 tons

\*\*\*school, position or technical flights (without passengers)

Source: Fraport Slovenija, d.o.o.

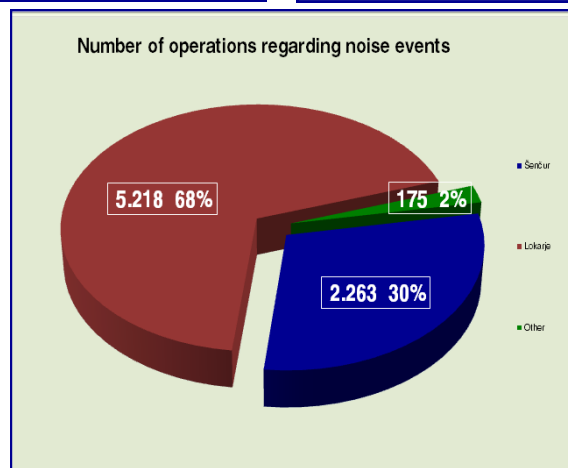
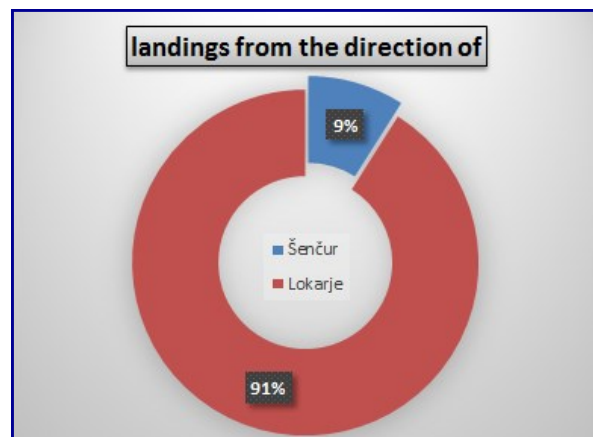
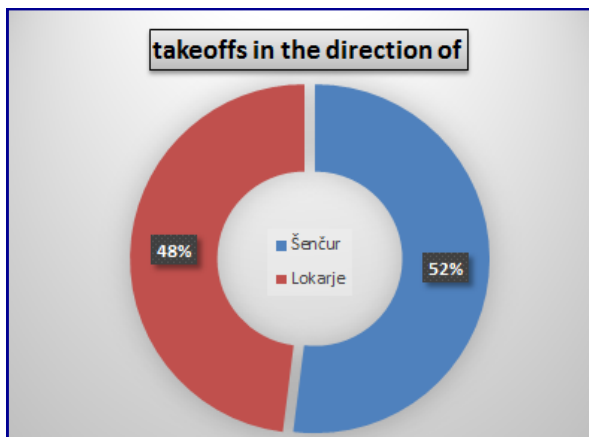
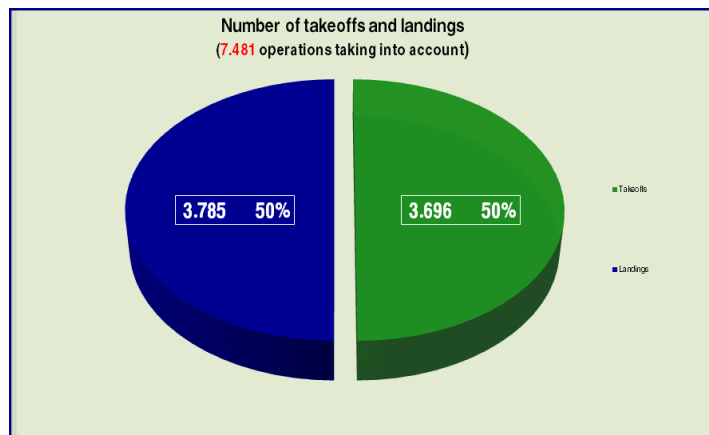
## 2. NOISE POLLUTION SOURCE DATA - measuring terminals

In the period Jan.-Mar. 2019 measuring terminals have taken 7.481 operations\* (3.696 takeoffs and 3.785 landings) into account. Overflights of school aircraft flights and most of military and police helicopter flights are not included in this number.

The share of takeoffs in the direction of Šenčur was 52% and the share of landings from the direction of Šenčur was 9%; also in the direction of Lokarje 48% and from the direction of Lokarje 91%.

Including the overflights, the measuring terminals have taken 7.656 operations into account, of which 2.263 (30%) operations are the takeoffs and landings in/from the direction of Šenčur and 5.218 (68%) operations are the takeoffs and landings in/from the direction of Lokarje. The number of other events, related to overflights of school aircraft flights and military and police helicopter flights, is 175 (2%).

\* Note: 1.6% of operations is not included due to uncertainty of data – the impact on the result of noise is negligible < 0,07 dB(A)



Source: ZVD Institute of Occupational Safety d.o.o.

### 3. MEASUREMENT RESULTS - noise indicators

The following environment noise indicators were calculated in the period Jan.-Mar. 2019, based on the measured noise data of individual events, associated with air traffic (takeoffs, landings, overflights of aircrafts):

Measuring terminal	Noise indicators [dB(A)] - monthly average												Limit values [dB(A)]			
	January				February				March				Decree on limit values for environment noise indicators			
	L <sub>D</sub>	L <sub>E</sub>	L <sub>N</sub>	L <sub>DEN</sub>	L <sub>D</sub>	L <sub>E</sub>	L <sub>N</sub>	L <sub>DEN</sub>	L <sub>D</sub>	L <sub>E</sub>	L <sub>N</sub>	L <sub>DEN</sub>	L <sub>D</sub>	L <sub>E</sub>	L <sub>N</sub>	L <sub>DEN</sub>
1 Šenčur I.	55	53	36	54	55	53	40	55	56	52	38	55	58	53	48	58
2 Lokarje	48	49	40	50	49	50	39	50	49	50	40	51	58	53	48	58
3 Kranj	53	50	35	52	53	48	39	52	53	51	36	53	58	53	48	58
4 Šenčur II.	53	52	37	53	54	50	38	53	54	50	37	53	58	53	48	58

Source: ZVD Institute of Occupational Safety d.o.o.

The table shows the daily calculated noise indicators:

- **Indicator L<sub>d</sub>** in dB(A) shows the daily noise load, due to the air traffic. The day time lasts between 6<sup>00</sup> and 18<sup>00</sup>. Depending on the number of noise events at each measuring point, we determined the average hourly noise load, on the basis of data on noise levels in dB (A) and the duration of the events t(s), which was sent to us as measurement data, by the measuring terminal. We use this hourly noise load for determining individual noise indicator.
- **Indicator L<sub>e</sub>** in dB(A) shows noise load, similar to the L<sub>d</sub> indicator, but at evening time that lasts between 18<sup>00</sup> and 22<sup>00</sup>. This is the time period when people are more susceptible to the disturbance. Therefore, 5 dB (A) is added during this time period.
- **Indicator L<sub>n</sub>** in dB(A) describes the night time that lasts between 22<sup>00</sup> and 06<sup>00</sup>. It is assumed that the population, around the airport (or other noise sources), is resting during this time period. Disturbances during this time period may have a profound impact on health and relaxation. Therefore, 10 dB (A) is added during this time period.
- **Indicator L<sub>den</sub>** in dB(A) represents the total daily noise load.

Regarding the seriousness of the excess, we marked the excessive noise indicators with a green highlighted print, for excesses up to 3 dB (A), with a blue highlighted print for excesses between 3 and 6 dB (A) and with a red highlighted print for excesses over 6 dB (A). A research on the noise pollution source is carried out for all the red and blue markings.

NOTE: average noise values are determined in accordance with the requirements of the Decree on limit values for environment noise indicators (OG RS No. 43/2018). Calculations are based on measured noise levels sent from different measuring terminals. They measure total noise and overflight noise of each aircraft. Weather conditions have a partial impact on results, which we are trying to eliminate as far as possible. The wind and thermal inversion still have a partial impact on the measuring results. Based on the SIST ISO 1996-2 standard, data have the uncertainty of about 3 dB (A), since it is not possible to completely exclude the effects of weather conditions (rain, wind, thermal inversion). This means that the actual result varies within -3 and +3 dB (A) of the written.

## 4. ANALYSIS - the loudest aircrafts and noise trend

The following events, in conjunction with takeoffs and landings, were the loudest in the period Jan.-Mar. 2019:

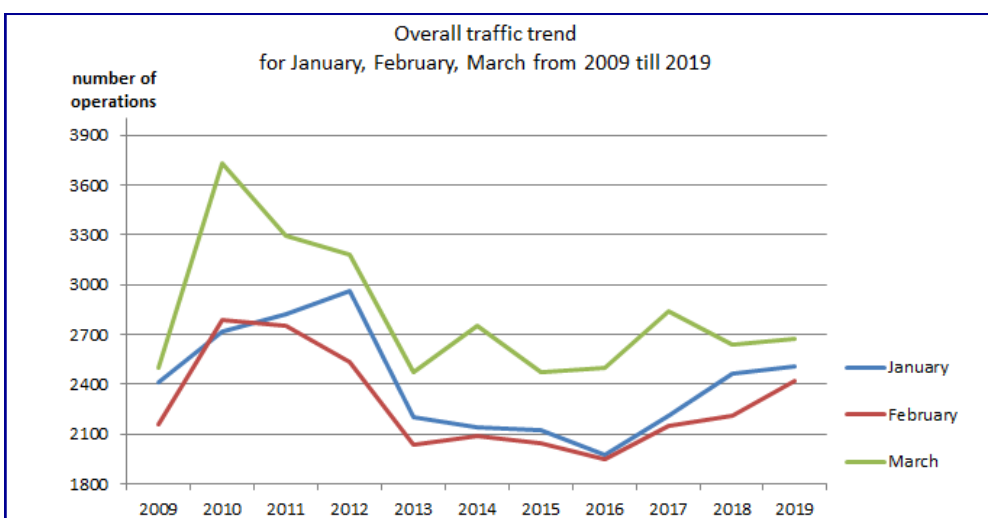
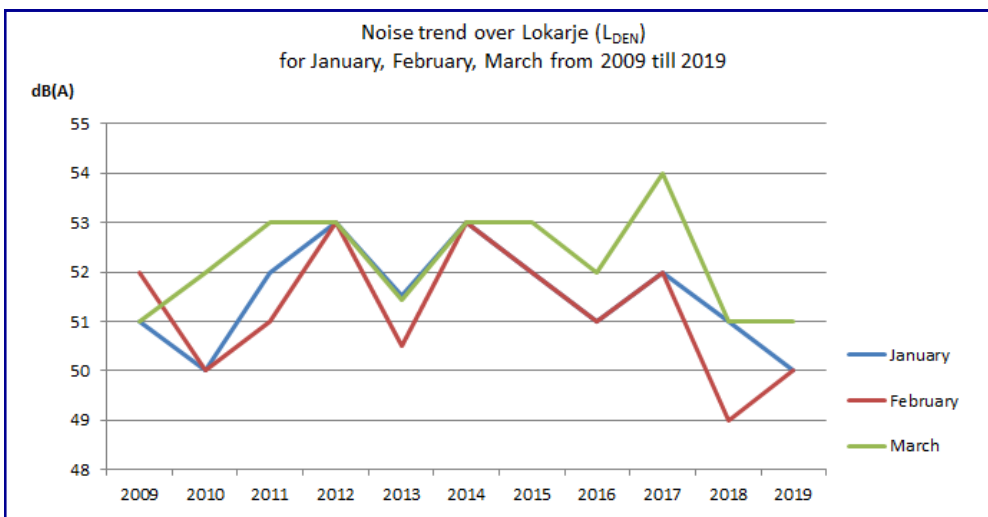
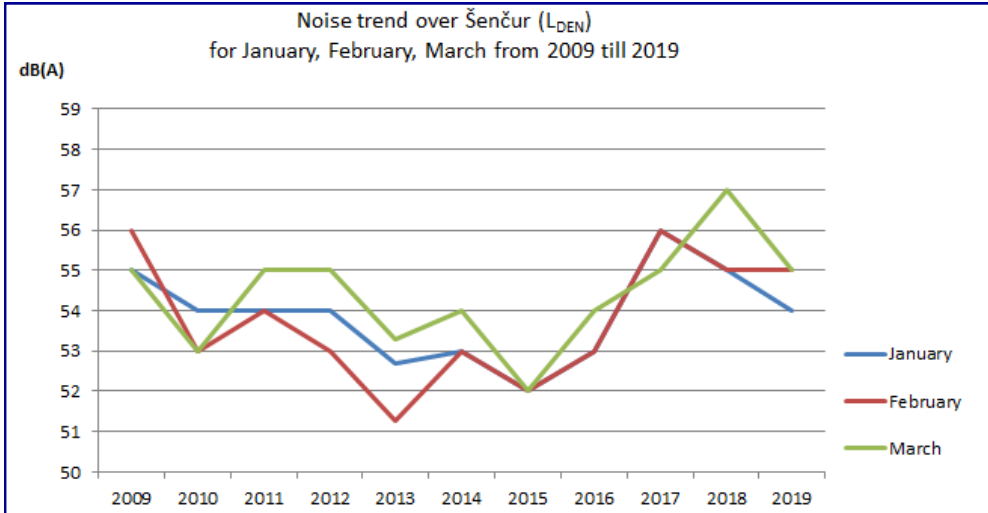
Šenčur I. overflight measurements			
Aircraft type	arrival (ARR) depart. (DEP)	Date and time of the event	Current noise level EPNL in dB(A)
Boeing 737-800	DEP	<b>11.3.2019 11:02</b>	101
		duration of the event 49 seconds	
Canadair CRJ 900	DEP	<b>20.3.2019 13:30</b>	101
		duration of the event 22 seconds	
Canadair CRJ 900	ARR	<b>11.3.2019 11:35</b>	100
		duration of the event 27 seconds	
Boeing 737-800	DEP	<b>20.1.2019 21:18</b>	98
		duration of the event 49 seconds	
Airbus A321	DEP	<b>11.3.2019 10:30</b>	98
		duration of the event 37 seconds	
Airbus A319	ARR	<b>7.1.2019 15:57</b>	98
		duration of the event 23 seconds	
Airbus A319	DEP	<b>28.3.2019 17:09</b>	98
		duration of the event 30 seconds	
Boeing 737-800	ARR	<b>2.2.2019 17:21</b>	98
		duration of the event 40 seconds	
Airbus A321	DEP	<b>25.3.2019 9:57</b>	98
		duration of the event 45 seconds	
Boeing 737-800	DEP	<b>13.1.2019 16:28</b>	98
		duration of the event 38 seconds	

Lokarje overflight measurements			
Aircraft type	arrival (ARR) depart. (DEP)	Date and time of the event	Current noise level EPNL in dB(A)
Antonov AN-12	DEP	<b>10.2.2019 19:11</b>	100
		duration of the event 20 seconds	
Canadair CRJ 900	DEP	<b>2.2.2019 20:32</b>	91
		duration of the event 27 seconds	
PIAGGIO P-180 Avanti	DEP	<b>16.1.2019 20:32</b>	91
		duration of the event 31 seconds	
Airbus A321	DEP	<b>6.3.2019 20:15</b>	91
		duration of the event 32 seconds	
Sukhoi Superjet 100-95	DEP	<b>22.2.2019 12:46</b>	90
		duration of the event 32 seconds	
Airbus A319	DEP	<b>10.3.2019 17:29</b>	90
		duration of the event 30 seconds	
Boeing 737-900	DEP	<b>22.2.2019 10:30</b>	90
		duration of the event 31 seconds	
Airbus A320	DEP	<b>17.1.2019 23:39</b>	90
		duration of the event 33 seconds	
Airbus A321	DEP	<b>10.2.2019 20:39</b>	90
		duration of the event 39 seconds	
Sukhoi Superjet 100-95	DEP	<b>17.3.2019 11:31</b>	90
		duration of the event 37 seconds	

Source: ZVD Institute of Occupational Safety d.o.o.  
Fraport Slovenija, d.o.o.

## 4. ANALYSIS - the loudest aircrafts and noise trend

The trend of noise changes over Šenčur and Lokarje from 2009 to 2019:



Source: ZVD Institute of Occupational Safety d.o.o.  
Fraport Slovenija, d.o.o.