

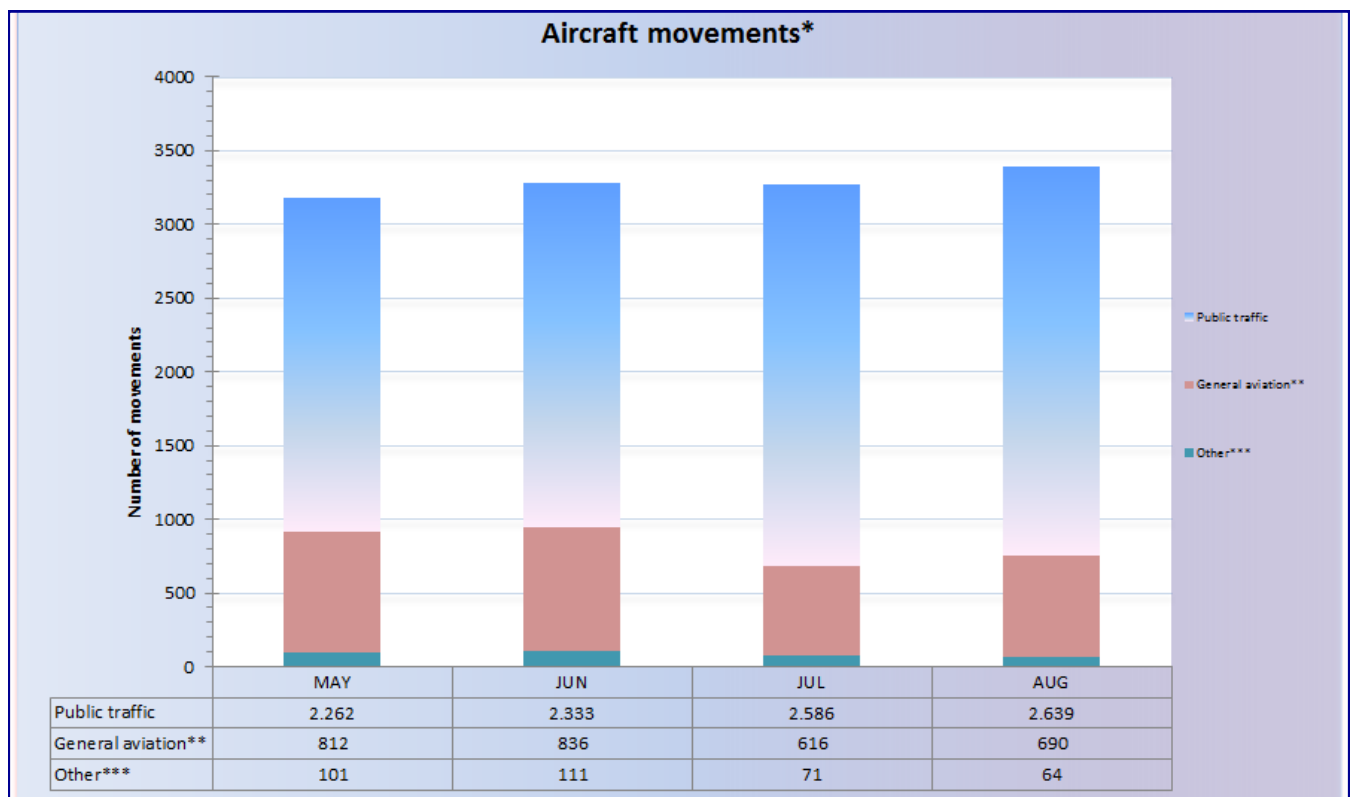
REPORT ON NOISE MEASUREMENTS

for the period MAY - AUGUST 2017

1. TRAFFIC FIGURES - aircraft movements

Information on aircraft movements in the second four months show a slight increase, compared to the same time period last year. There were 13.121 aircraft movements, which is 2,6% more compared to the same time period last year. The data are:

- 3.175 aircraft movements in May, which is 11,3% more compared to the same time period last year,
- 3.280 aircraft movements in June, which is 1,6% more compared to the same time period last year,
- 3.273 aircraft movements in July, which is 1,8% more compared to the same time period last year,
- 3.393 aircraft movements in August, which is 2,9% less 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)

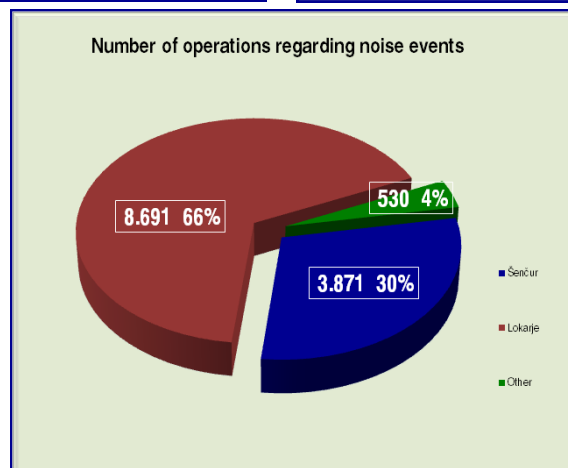
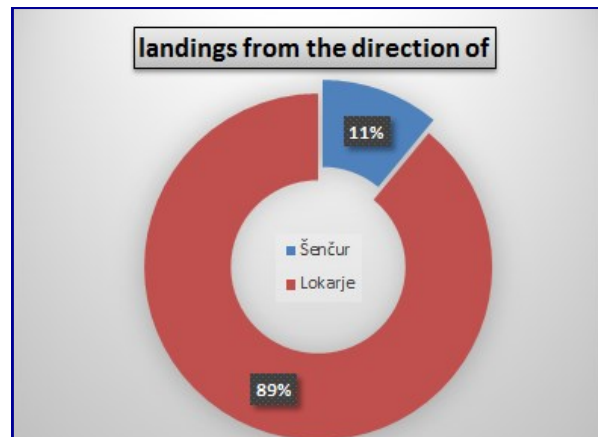
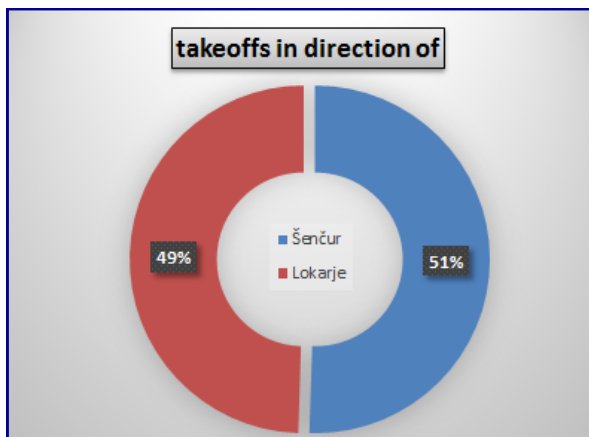
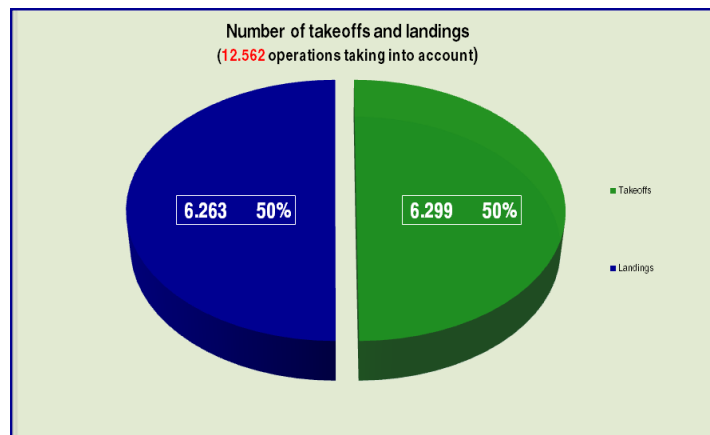
2. NOISE POLLUTION SOURCE DATA - measuring terminals

In the second four months of this year measuring terminals have taken 12.562 operations* (6.299 takeoffs and 6.263 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 51% and the share of landings from the direction of Šenčur was 11%; also in the direction of Lokarje 49% and from the direction of Lokarje 89%.

Including the overflights, the measuring terminals have taken 13.092 operations into account, of which 3.871 (30%) operations are the takeoffs and landings in/from the direction of Šenčur and 8.691 (66%) 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 530 (4%).

* Note: 4.3% of operations is not included due to uncertainty of data – the impact on the result of noise is negligible < 0,19 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 second four months of this year, 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)]			
	May				June				July				August				Decree on limit values for environment noise indicators			
	L _D	L _E	L _N	L _{DEN}	L _D	L _E	L _N	L _{DEN}	L _D	L _E	L _N	L _{DEN}	L _D	L _E	L _N	L _{DEN}	L _D	L _E	L _N	L _{DEN}
1 Šenčur I.	56	53	46	56	56	54	46	57	56	54	47	57	57	56	47	58	58	53	48	58
2 Lokarje	53	52	45	55	53	53	46	55	53	53	46	55	54	54	47	56	58	53	48	58
3 Kranj	51	50	46	54	52	51	45	54	52	49	46	54	52	49	46	54	58	53	48	58
4 Šenčur II.	55	53	46	56	55	53	45	56	55	54	47	56	55	54	46	56	58	53	48	58

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

The table shows the daily calculated noise indicators:

- **Indicator L_d** in dB(A) shows the daily noise load, due to the air traffic. The day time lasts between 6⁰⁰ and 18⁰⁰. 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_e** in dB(A) shows noise load, similar to the L_d indicator, but at evening time that lasts between 18⁰⁰ and 22⁰⁰. 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_n** in dB(A) describes the night time that lasts between 22⁰⁰ and 06⁰⁰. 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_{den}** 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. 105/2005, 34/2008, 109/2009 in 62/2010). 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.

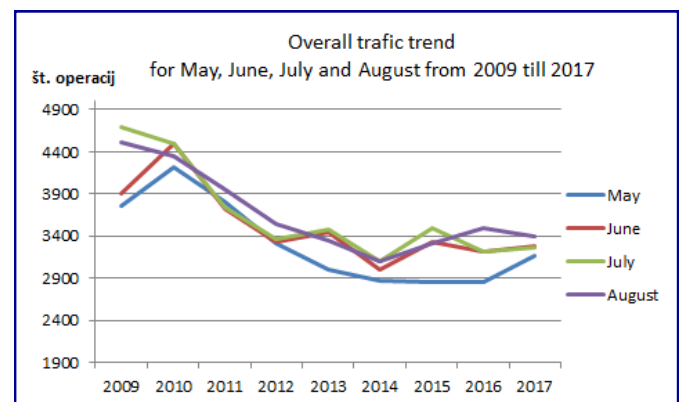
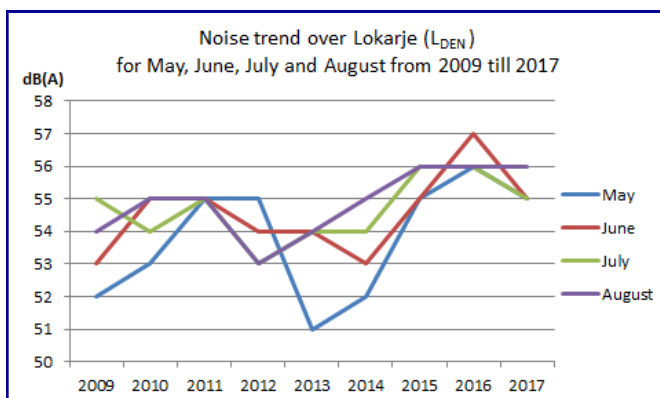
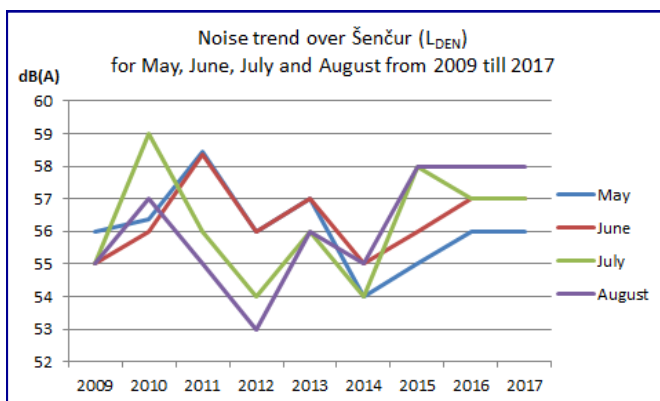
4. ANALYSIS - the loudest aircrafts and noise trend

The following events, in conjunction with takeoffs and landings, were the loudest in the second four months of this year:

Šenčur I. overflight measurements			
Aircraft type	arrival (ARR) depart. (DEP)	Date and time of the event	Current noise level EPNL in dB(A)
Canadair RJ-900	DEP	13.7.2017 12:36 duration of the event 16 seconds	102
Airbus 320	ARR	10.8.2017 18:20 duration of the event 20 seconds	100
Embrear ERJ-170	ARR	2.8.2017 11:39 duration of the event 18 seconds	99
Boing 737-300	DEP	2.8.2017 21:12 duration of the event 23 seconds	99
Boeing 767-300	DEP	26.7.2017 11:50 duration of the event 19 seconds	99
Airbus 319	DEP	10.8.2017 18:43 duration of the event 23 seconds	99
Airbus 319	DEP	28.5.2017 15:05 duration of the event 31 seconds	99
Boeing 737-800	DEP	27.5.2017 12:18 duration of the event 24 seconds	98
Airbus 319	DEP	29.6.2017 17:15 duration of the event 28 seconds	98
Boeing 737-400	DEP	10.8.2017 18:06 duration of the event 23 seconds	98

Lokarje overflight measurements			
Aircraft type	arrival (ARR) depart. (DEP)	Date and time of the event	Current noise level EPNL in dB(A)
Airbus 320	ARR	1.7.2017 22:41 duration of the event 38 seconds	100
Boeing 737-400	DEP	18.8.2017 2:01 duration of the event 26 seconds	99
Airbus 319	ARR	24.7.2017 14:50 duration of the event 22 seconds	98
Boeing 737-800	ARR	11.7.2017 21:15 duration of the event 28 seconds	97
Fairchild C-26	ARR	11.7.2017 21:25 duration of the event 24 seconds	96
Bombardier Q400	DEP	25.7.2017 17:11 duration of the event 24 seconds	95
Airbus 319	DEP	30.6.2017 20:15 duration of the event 20 seconds	95
Airbus 319	DEP	29.6.2017 10:02 duration of the event 25 seconds	94
Airbus 321	DEP	30.6.2017 20:15 duration of the event 28 seconds	94
Boing 777-300ER	DEP	17.4.2017 6:17 duration of the event 22 seconds	94

The trend of noise changes over Šenčur and Lokarje from 2009 to 2017:



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