



# PREDJAMA SUSTAINABLE

Challenges and solutions of heavy traffic loads caused by visitors to the village of Predjama

Monitoring of daily visits to Predjama



## TASK INFORMATION

Task	Predjama sustainable
Leading partner	Municipality of Postojna, Ljubljanska 4, 6230 Postojna
The representative of the partner	Maja Piškur
Contract number	Partnership Agreement dated 24/09/2021
Partner	IPoP - Institute for Spatial Policies Tržaška 2, Ljubljana
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# MONITORING OF THE DAILY VISIT TO THE PREDJAMA

## METHOD

In order to verify the achievement of **the goal of the Predjama Sustainable project, which is to increase the use of sustainable forms of mobility by five percentage points**, we carried out monitoring of traffic and tourist flows in the tourist destination of Predjama. With the help of repeating the analysis from 2022, we wanted to check whether the measures of the mobility plan implemented so far have been successful and whether any adjustments are necessary.

The method used was the same as last year. By recording the vehicles coming and going from Predjama, we obtained data on the number and type of vehicles, the number of visitors and the duration of the visit in one day. We then compared these data with last year's.

The count was carried out on a sunny Tuesday, August 8, 2023. The monitoring was carried out on a day comparable to the year before, from the point of view of weather conditions and the time of the count, as a result, the assumption about the tourist visit on that day was also the same. August is the high season in Predjama, and the sunny weather means fewer visits. The largest number of visitors to Postojna is on cloudy and rainy days, when tourists from the Slovenian and Croatian coasts come on day trips. We therefore assume that the repeated counting day was also one of the more usual days in August and not one of those that represent the peak of the tourist season.

The counting took place between 8 a.m. and 8 p.m. in Predjama next to the import in the upper parking lot until they were full, and then next to the church of the Sorrowful Mother of God. The vehicles that arrived in Predjama or departed from it were recorded physically in pre-prepared tables. The time of arrival and departure, the type of vehicle and the number of people in the vehicle were entered. The registration number was used as the car identifier. The vehicles were separated into cars, combined vehicles, motorhomes, motorbikes, buses, bicycles, and we also recorded pedestrians who apparently walked the entire way to Predjama Castle. Among the high density of pedestrians, it was difficult to distinguish them from those who were walking from the parking lot to the castle. The counting was done by six local pupils and students in two shifts.



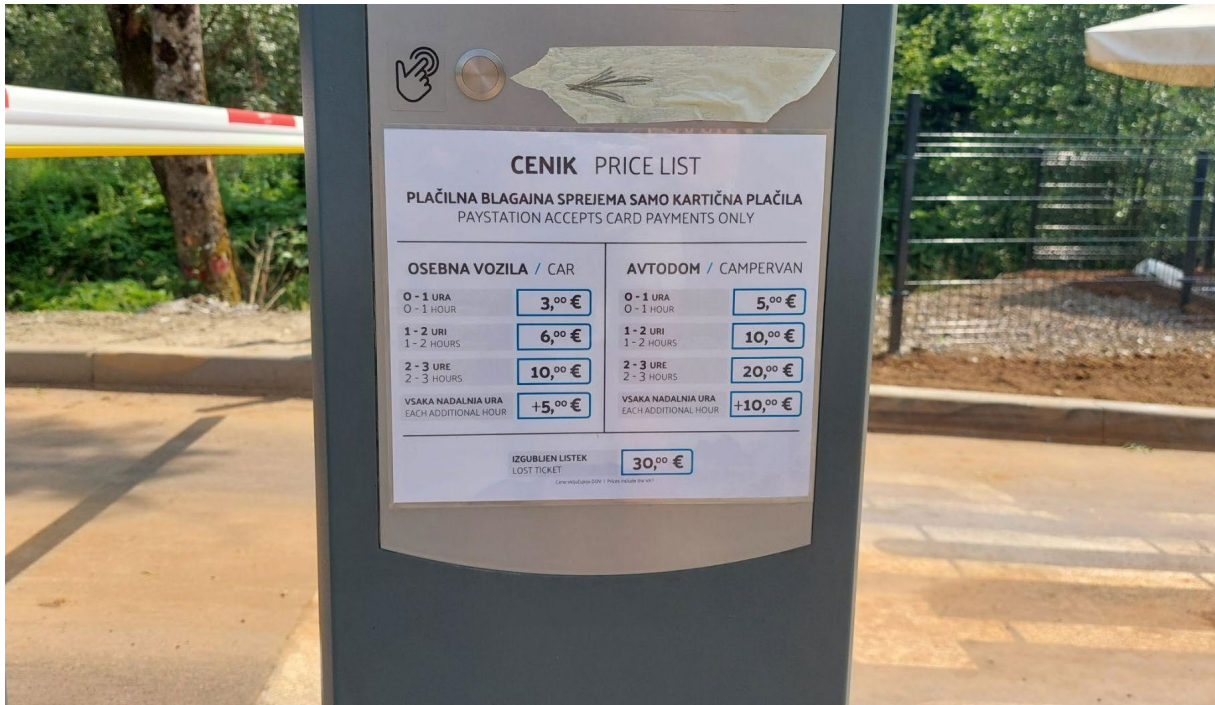
Figure 1: View of the counting station and towards the platform.

## CHANGES IN CONDITION

The day of the monitoring was carefully chosen so that the conditions would be similar to last year. In this way, we can find out how the implemented measures of the mobility plan affected the mobility of visitors to Predjama. Of course, when interpreting the data, changes that we had no influence on and are not part of the measures should also be kept in mind - for example, the movement of the external border of the Schengen area from the Slovenian-Croatian border and the floods that affected the northern part of Slovenia in the week before the monitoring. The influence of such external factors is difficult to assess.

Some measures of the mobility plan were introduced with the beginning of this year's tourist season, and their purpose was **to increase the share of sustainable arrivals in Predjama without reducing tourist visits**. Most of the measures were carried out within the framework of the Predjama Sustainable project.

at the parking lots in Predjama has changed . Barriers have been installed in **the newly arranged lower parking lot , and the parking fee is paid by the hour at the parking meter**. For passenger vehicles, the first and second hour each cost €3, the third hour €4, and each subsequent hour €5. The parking fee is higher for motorhomes. In the other parking lots, parking wardens still manually collect the daily parking fee, which has risen from €5/day to €6/day for private vehicles, and from €10/day to €12/day for motorhomes.



Picture 2: Price list for parking in the lower parking lot.

In order to encourage the use of public passenger transport, the offer is expanded with two additional lines, one of which is free <sup>1</sup>, covered by the Predjama Sustainable project. It operates outside the summer season, when visits increase due to vacations and holidays. It runs between Postojna Railway Station and Predjama. The second line was introduced between Planina and Predjama and operates during the tourist season (July, August). The operator of this connection is Edo Tours, and the price of a return ticket is €2.

The shuttle bus line between Postojna and Predjama remains the same. It operates during the high tourist season, the frequency of rides is 15-30 minutes and is adjusted to the need. The price of a return ticket is €1.

<sup>1</sup>Municipality of Postojna, 2023. Three bus lines, intended to reduce traffic near tourist destinations. URL: <https://www.postojna.si/post/785277>

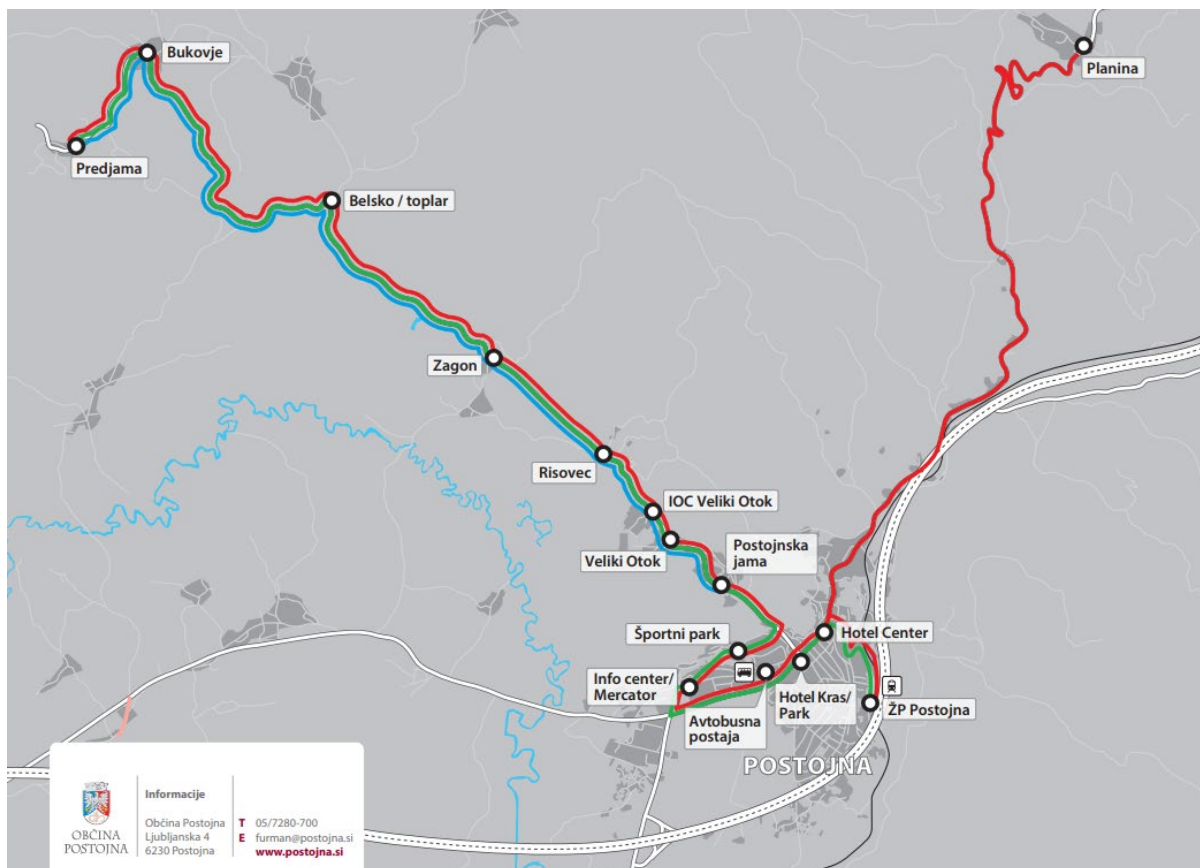


Figure 3: Scheme of three bus lines, which do not all run at the same time (red and blue in summer, green during the year on holidays and vacations).

To encourage cycling and walking, the circular Zmajeva footpath and Erasm bike path were newly marked <sup>2</sup>.

In order to increase visitors' awareness, the project also prepared environmental statements in three different languages, which, with the help of various facts, increase visitors' awareness of the importance of using sustainable mobility <sup>3</sup>. In addition, at Postojna Cave, motorhome drivers are specifically warned about space constraints in Predjama and are directed to the shuttle bus.

<sup>2</sup>Municipality of Postojna, 2023. To Predjama along the Dragon and Erasm route. URL: <https://www.postojna.si/objava/771370>

<sup>3</sup>Municipality of Postojna, 2023. Environmental statements. URL: <https://www.postojna.si/post/775519>



## RESULTS

We compared the results of the monitoring with the results of the analysis from 2022. We compared the shares of vehicles and people this year and last year in order to determine how (if at all) the measures of the mobility plan affected traffic and tourist flows in Predjama and what possible adjustments are needed.

### Number of vehicles and passengers

All registered vehicles at this year's measurement were 858. In the final number vehicles, as last year, we did not count vehicles that immediately turned around (81 vehicles, 9%) and local residents and employees (2%). **The compared number of vehicles was 757.**



Figure 4: A sign pointing to the lower parking lot restricts access to the platform and is removed by traffic wardens when necessary.

Table 1: Results of the 2023 vehicle count

vehicle	no. vehicles	%	no. people	%	avg. vehicle occupancy
car	592	78%	1604	52%	2.7
van (passenger/cargo)	45	6%	148	5%	3.3
motorhome	34	4%	93	3%	2.7
engine	26	3%	54	2%	
bus	25	3%	1102	36%	44.1
bike	10	1%	14	0%	
pedestrian	25	3%	71	2%	
<b>together</b>	<b>757</b>	<b>100%</b>	<b>3086</b>	<b>100%</b>	

Table 2: Comparison of vehicle count results with 2022.

vehicle	no. vehicles 2022	no. vehicles 2023	% 2022	% 2023	no. persons 2022	no. persons 2023	% 2022	% 2023
a car	712	592	77%	78%	1748	1604	62%	52%
van	37	45	4%	6%	137	148	5%	5%
motorhome	66	34	7%	4%	165	93	6%	3%
engine	52	26	6%	3%	66	54	2%	2%
bus	25	25	3%	3%	689	1102	24%	36%
bike	33	10	4%	1%	39	14	1.5%	0%
on foot	1	25	0%	3%	1	71	0%	2%
<b>TOGETHER</b>	<b>926</b>	<b>757</b>			<b>2845</b>	<b>3086</b>		

Table 3: Comparison of occupancy and average visit time with 2022

vehicle	average no. of persons/vehicle 2022	average no. persons/vehicle 2023	average visit time 2022	average visit time 2023
a car	2.5	2.7	1:41 a.m	1:29
van	3.7	3.3	/	/
motorhome	2.5	2.7	1:42	2:13 am
engine	/	/	1:29	1:04 am
bus	27.6	44.1	/	/
<b>TOGETHER</b>			<b>1:37</b>	1:35

- On the day of the monitoring, there were **170 fewer vehicles and 191 more people in Predjama** than the year before.
- Although there were **120 fewer passenger cars this year**, they still represent **the largest share among vehicles - 78%**, which is one percentage point more than last year. However, **cars were better occupied this year (2.7 passengers per car), with 52% of all visitors** arriving in them .
- 148 passengers traveled with **45 vans or 5%** of visitors, which is the same percentage as last year, and occupancy was lower - an average of 3.3 compared to 3.7 people per vehicle, as there were more vans this year.
- **34 holiday vans and motorhomes** were registered , which is **32 fewer than last year**. They transported 93 persons or 3% of visitors. This is as much as **3 percentage points less than last year**. Occupancy was the same as for cars, 2.7 persons per vehicle and higher than last year (2.5 persons per vehicle).



They stayed in Predjama for the longest time on average, 2 hours and 13 minutes. **This is 31 minutes more than last year.**

- It was more difficult to follow **motorcyclists** , **because they often arrive in groups and park next to the church, i.e. they drive quickly past the counting place and do not stand in the queue to pay the parking fee.** 26 motorbikes with 54 passengers were recorded. 2% of all visitors.
- **24 buses** arrived in Predjama that day (one bus less than last year), of which **18 were shuttle buses** . **Bus occupancy was much higher than last year.** This year, 1,052 passengers arrived in them, representing **35% of all visitors** to Predjama that day, and last year 689 passengers arrived, representing 24% of all visitors that day.
- **10 cyclists** were recorded , including children in child seats. There were fewer of them than last year, the share of cyclists was **2.5 percentage points lower.**
- **There were 25 pedestrians** who apparently made their way to Predjama on foot. There were 2 percentage points more pedestrians than last year. There is a possibility of a measurement error here, as some pedestrians may have been counted who actually came with a car, but parked it higher up on the road or at the cemetery.
- **The average visit time** of visitors who came by car, motorhome or motorbike is **1 hour and 35 minutes** , which is almost the same as last year, when they spent an average of 1 hour and 37 minutes in Predjama.
- Again this year, between 70 and 80 vehicles turned around as soon as they arrived in Predjama.
- If we add up **sustainable forms of mobility** - pedestrians, cyclists and bus passengers, 1,137 people or. **38% of visitors.** This is **12 percentage points more than last year**, when 26% of visitors were sustainable. **The goal of the Predjama Sustainable project** (improving the use of sustainable forms of mobility to access Predjama by at least 5 percentage points) was therefore **achieved** .

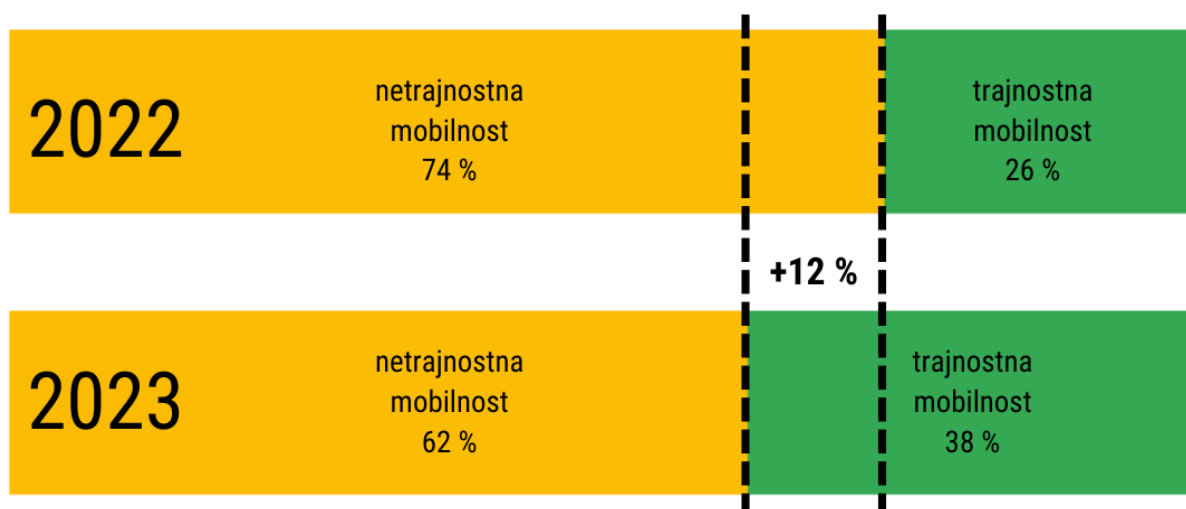


Figure 5: Share of sustainable mobility in the destination Predjama last year and this year.



## **MAIN FINDINGS**

- A much larger share of visitors came to Predjama by bus instead of by car and motor home.
- By managing the traffic on the way to and in Predjama, by providing alternatives to the car and promoting them, the same or even more people can be transported to Predjama with fewer vehicles.
- The measures do not affect the number and duration of visits to Predjama.

## GRAPHIC COMPARISON OF INCOME BETWEEN THE YEARS

### Primerjava deležev pripeljanih vozil leta 2022 in 2023

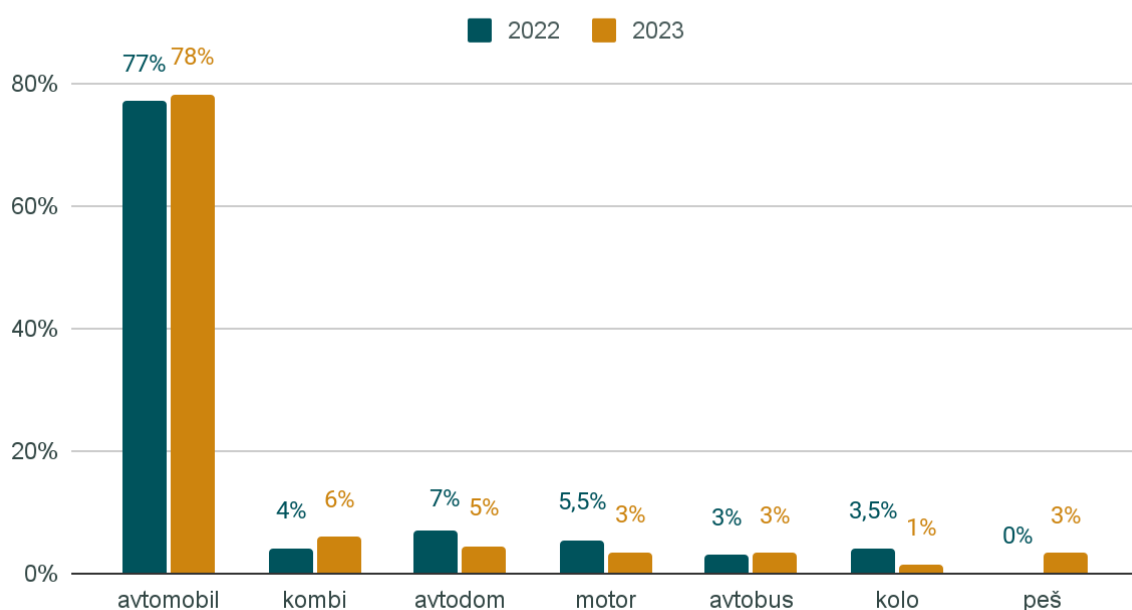


Figure 6: Comparison of vehicle shares in 2022 and 2023

### Primerjava deležev oseb leta 2022 in 2023 glede na način prevoza

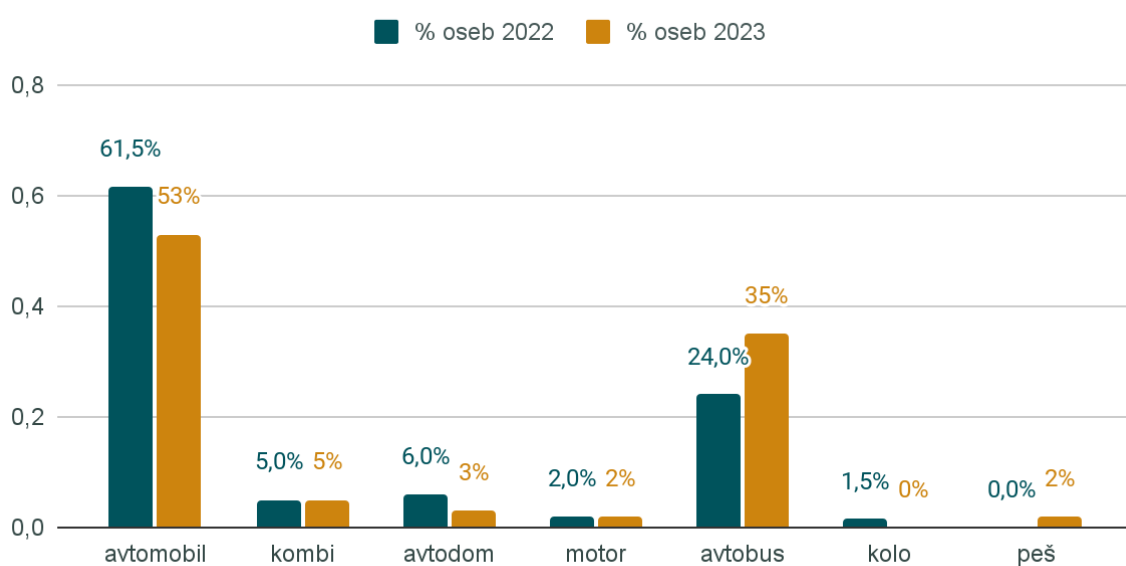


Figure 7: Comparison of the shares of people in 2022 and in 2023 according to the mode of transport.

## DISTRIBUTION OF VEHICLE AND VISITORS ARRIVALS DURING THE DAY

The graphs below show a comparison of the totals of vehicle arrivals and visitors to Predjama in each hour during the traffic count time. The operating hours of the castle in 2023 were between 10:00 a.m. and 6:30 p.m., and in 2022 between 9:00 a.m. and 7:00 p.m.

In 2022, the number of visitor arrivals slowly increased from the morning and reached its peak **between 12:00 and 13:00**, when there were 419 visitors in Predjama. A year later, the peak was reached **between 2 and 3 p.m.**, when there were as many as **457 visitors at the location**.

In 2023, the number of arrivals increases significantly between 10 and 11 o'clock. Although there were more early visitors in 2023, between 9 and 10 a.m. a larger visit was recorded in 2022, which coincides with the earlier opening of Predjama Castle. Between 1pm and 2pm (lunchtime), the number drops in both measurement periods. After 3 p.m., the number of visitors decreases, but in 2023 more slowly than the year before. Between 5 and 6 p.m., there are almost 100 more visitors to the location in 2023 than in 2022. After 7 p.m., there are few visitors in Predjama during both measurements.

### Primerjava št. obiskovalcev v Predjami po urah 2022 in 2023

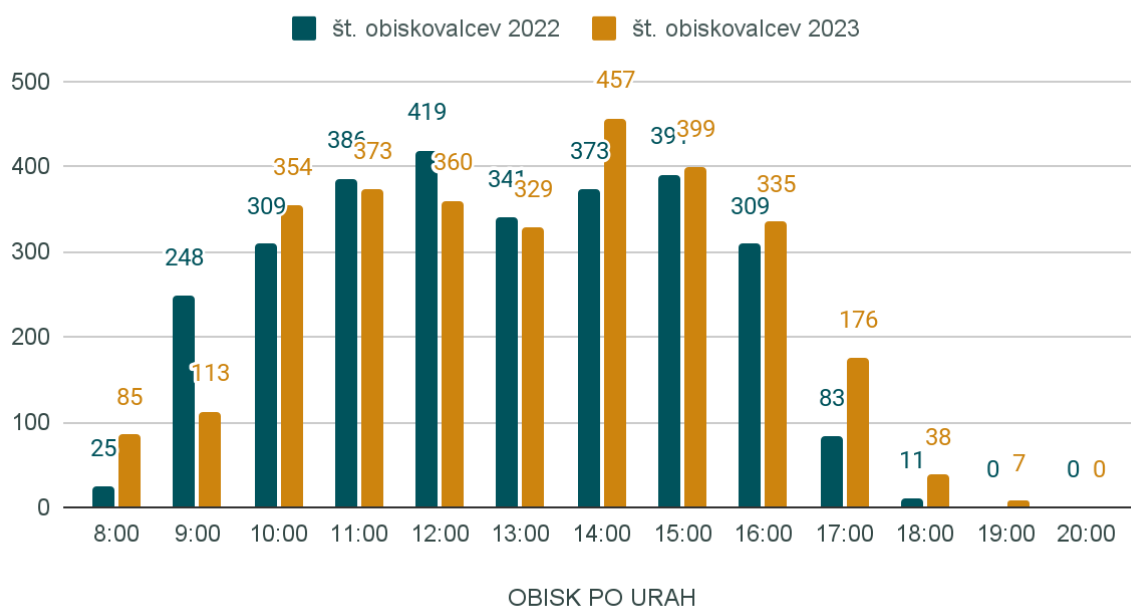


Figure 8: Comparison of the number of visitors in Predjama by hours between 2022 and 2023

While the number of people visibly rises and falls throughout the day, the number of vehicle arrivals throughout the day is more constant and does not move exactly the same as the number of visitors. In 2022, the most vehicles were not between 12:00 and 13:00, when there were the most visitors, but between 15:00 and 16:00. A year later it was a little different, as the number of vehicles peaked between 11 a.m. and 12 p.m. The total number of vehicles in 2023 was lower than in 2022, and there were also fewer vehicles in Predjama during peak hours.

In 2022, between 10:00 and 16:00, the number of incoming vehicles was always slightly above 100 vehicles per hour, while in 2023, more than 100 incoming vehicles were recorded only between 11:00 and 13:00. After 4 p.m., the number of vehicles drops sharply in both years.



## Primerjava števila vozil v Predjami po urah 2022 in 2023

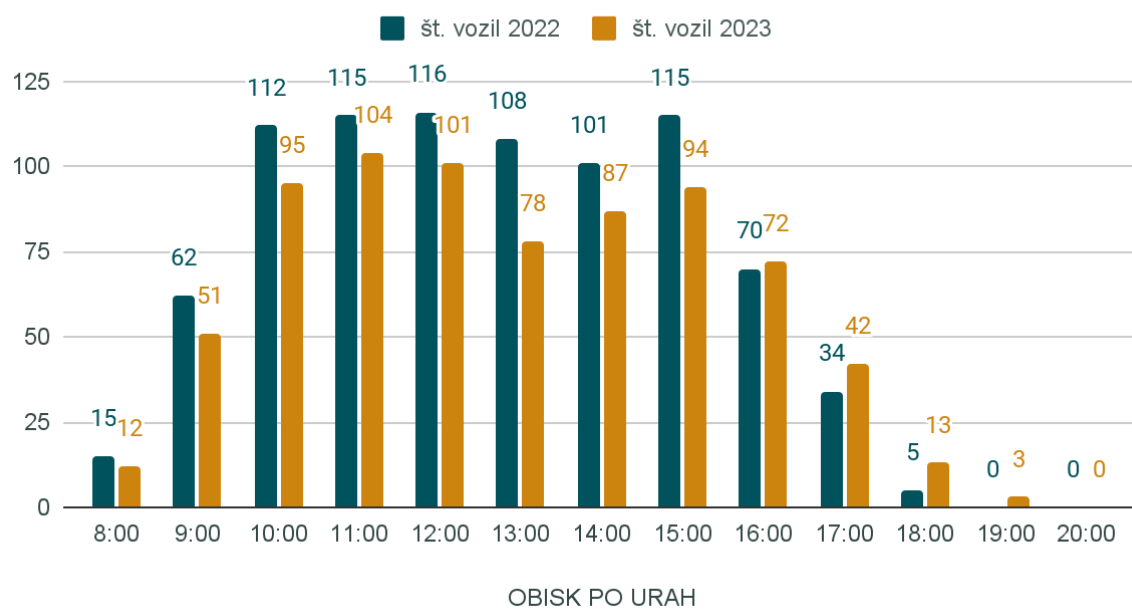


Figure 9: Comparison of the number of vehicles in Predjama by hours between 2022 and 2023

## NUMBER OF PASSENGERS ON BUSES BY HOURS

On the day of the count, buses operating on the route between Postojna cave and Predjama and on the route between Planina and Predjama operated from 11 a.m. to 6:30 p.m. There are around 55 seats and 17 standing places on the buses. On average, 43 passengers traveled on the buses, but the busiest bus was at 2:55 p.m., which brought as many as 65 passengers. Most passengers arrive in Predjama by shuttle bus between 1 and 5 p.m.

### Število prepeljanih potnikov z avtobusom po urah

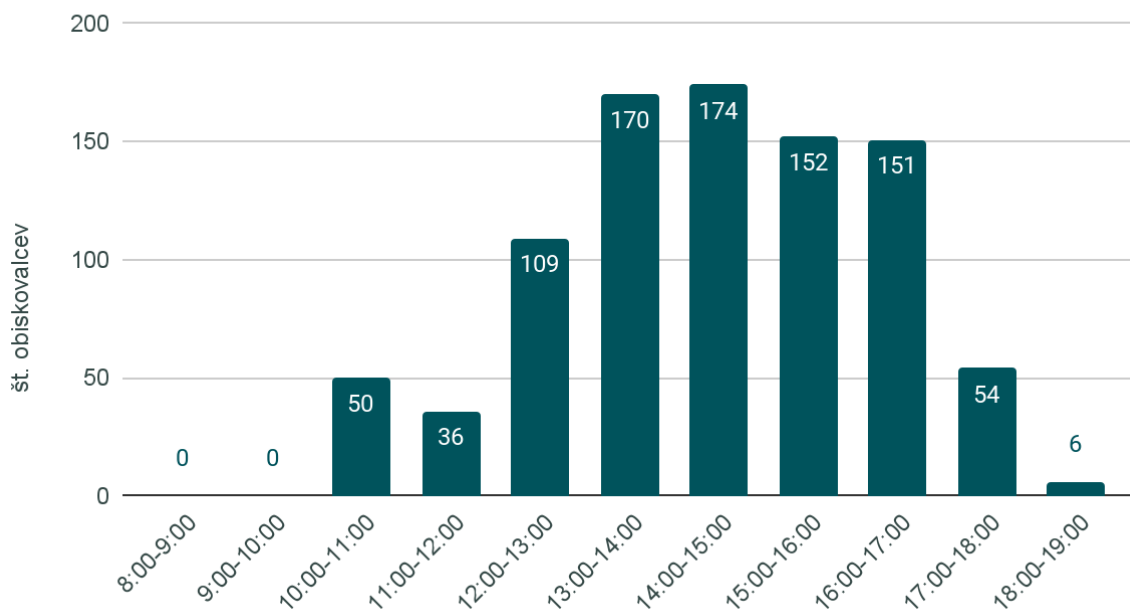


Figure 10: Number of passengers on buses in individual hours.