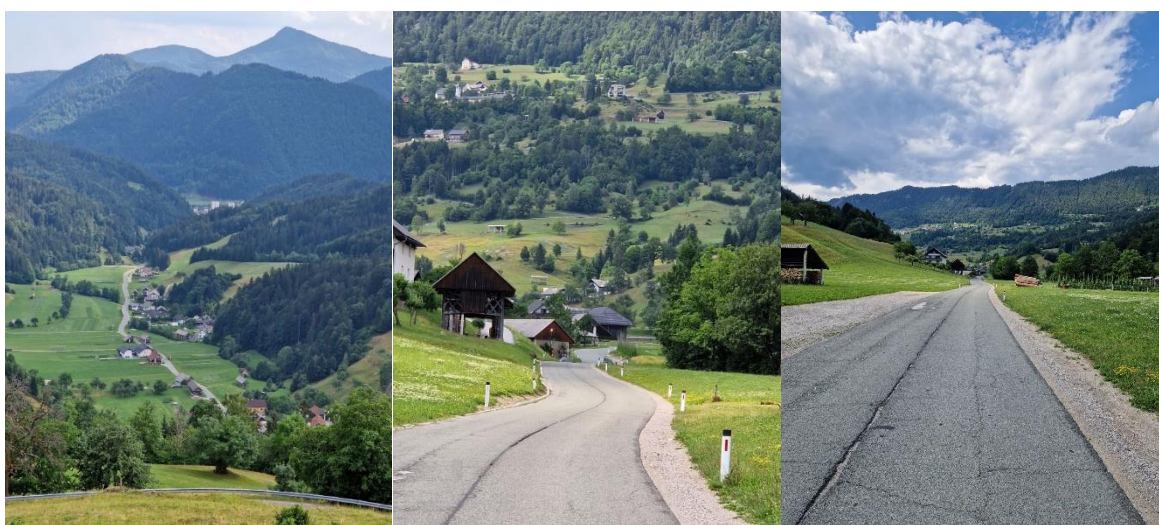


# Assessment of the public lighting project in/near Rudno near Železniki

## Description of the situation

Construction of sidewalks and public lighting along a 3<sup>rd</sup> order regional road (Železniki-Dražgoše-Kropa) in front of and in the Rudno near Železniki settlement. Length approx. 1 km. Scattered rural settlement in a side valley. There is a small ski area at the beginning of the route. In the initial part, there is a link to the already existing arrangement in the settlement Češnjica (part of Železniki). Most of the route is formally outside the village, but there are scattered houses and a local ski resort along the entire route. The average annual daily traffic is around 1000 vehicles. It is a connection to the village of Dražgoše and partly further towards Kropa, Jelovica and the Besnica valley.



Display in Google Maps :

<https://www.google.com/maps/@46.2253881,14.169061,2091a,35y,38.85t/data=!3m1!1e3>

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## General opinion on the acceptability of the project

The construction of a pedestrian surface (sidewalk or separate surface) makes sense and is probably completely sufficient to ensure the safety and comfort of pedestrians, even without lighting or with lighting only at the most exposed points or sections (mainly the ski resort).

On the other hand, the installation of lighting in such an area is extremely controversial, especially if it is a usual dense linear installation in accordance with the lighting standard, which is also foreseen in this project. It is a rural area in which public lighting is a very obvious element of urbanization, significantly changing the character of the area and degrading it visually and ecologically. **The lighting of transit roads through scattered rural settlements**

**and even beyond them represents one of the most problematic aspects of current approaches to lighting**, because in this way we get long lines of lighting through rural space (typically several km, with the potential of up to tens of km). In cases such as the one under discussion, moreover, the lighting is spread continuously for kilometers far into the sparsely populated rural area of the side valleys in the vicinity of the central settlements, in this case Železniki. In this way, entire rural areas within a radius of several kilometers become illuminated and thus urbanized. It is particularly problematic that sections outside settlements are also illuminated, while the draft of amended legislation already foresees that lighting outside settlements is prohibited.

Such extensive lighting also represents a serious environmental problem, not only because of the most obvious impact on the visibility of the starry sky, but also because of direct harmful effects through habitat fragmentation (e.g. "walls" for bats and other animals), effects on insects... Last but not least, lighting also affects on the perception of space and people's well-being, on the imposed need to prevent light from entering living spaces (blinds that obstruct ventilation) and, in extreme cases, even causes illness due to sleep and hormonal rhythms disorders.

**In the case of the discussed route, it is a typical example of a location where, in order to prevent the negative effects mentioned above, it is absolutely necessary to proceed from the principle that lighting is installed only where it is absolutely necessary.** As already mentioned, this means that if necessary (as pointwise as possible) only exposed points or sections, such as the transition between the parking lot and the ski area, are illuminated. Some additional orientational lights are potentially installed, while continuous linear lighting is strongly discouraged in this area.

### **Opinion on lighting design**

In the context of existing approaches to lighting, the project is exemplary and rational and only potential minor corrections can be discussed within the framework of these concepts. As stated in the previous chapter, the problem is that the **especially for rural areas the existing concepts are not suitable**, and as a result, despite efforts, the problem of inappropriate lighting and its negative impacts is still not under control.

Specific comments on designed lighting (as a whole valid only within existing concepts that are not appropriate):

- Class P4 is fairly chosen, that is, medium-intensity lighting for pedestrians. In similar cases, stronger lighting according to the M classes intended for motor vehicles is often chosen. According to the table in the EN 13201-1 standard, P5 or even P6 could be chosen more appropriately for the location.
- A total of 36 lamps are designed to illuminate a section at a distance of 1 km. The number of lamps is very large for such a space.
- The power of the lamps is 10 W, and the illumination under the lamps is around 11 lx. It is a rational choice, which will probably prevail in less demanding locations in the future. The lamps may even be slightly weaker.
- The height of the lamps is 5 m, which is more suitable for this space than if they were higher. Otherwise, while meeting the requirements of the standard (minimum and uniformity of illumination), this partly contributes to a smaller distance between the lamps (around 27 m in the project), but even within the concept of linear lighting according to the standard, at this height of the lamps, with suitable optics (glare = ?) a distance of up to around 50 m could be achieved. With the current spacing of 27 m

and numerous lamps, the lighting columns will be a visually strongly dominant element, inappropriate for this rural space. A greater distance would alleviate this problem somewhat, but still it is not an adequate solution for this space and actual needs.

- The light temperature (CCT) is 3000K, which is in line with today's approaches, but trends and regulations are likely to go to even lower CCTs in the near future. It would be more appropriate if 2700K or even 2200K is selected.
- It is not clear from the project, if there is a provision for switching off in the late night hours, which will probably become mandatory in the future.

### **Project implementation proposal**

Only the road section near the ski area should be illuminated with a few lamps, which should be done point by point, at the points of crossings across the road, similar to how the lighting is arranged now.

If necessary, additional (in general isolated) lamps can also be placed at other exposed points or in a concentrated part of the settlement. It should be taken into account that lighting outside settlements is not desirable and will most likely be prohibited in the future.

It is highly recommended that experts with knowledge of the aesthetic aspects of landscaping (landscape architects...) participate in the arrangement of the lamps, which means that not only safety and technical aspects are considered, but the project is approached from the point of view of complex landscaping. The current rural character of the area should be preserved as much as possible.

The illumination under the lamps should not exceed the currently designed level of around 10 lx, or the recommendations should be followed where needed. Stronger lighting in this space does not contribute to better visibility, but at the same time, it would cause an increased need to adjust the eyes to the transitions between illuminated and unilluminated sections.

The color temperature of the light should not be higher than 2700 K. It is desirable that it is as close as possible to 2200 K.

It is recommended that the color of the poles is dark gray or black. Given that it's about pavement lighting, the reduced visibility of the poles compared to the gray galvanized ones will not significantly contribute to the increase in collision risk. If possible, the design of the poles and lamps should be chosen by experts in space planning, and the design should be adapted to the character of the particular area and/or of the wider area of Železniki.

It is necessary to arrange for switching off after 11 p.m. at the latest, and for lamps that are related to the operation of the ski area, half an hour after the end of the operating time.

Aleš Šubic

Poljane nad Škofjo Loko, 7/7/2022