Rail4Regions

D.2.3.3

Test application Decision-making tool for industrial sidings

Version 1

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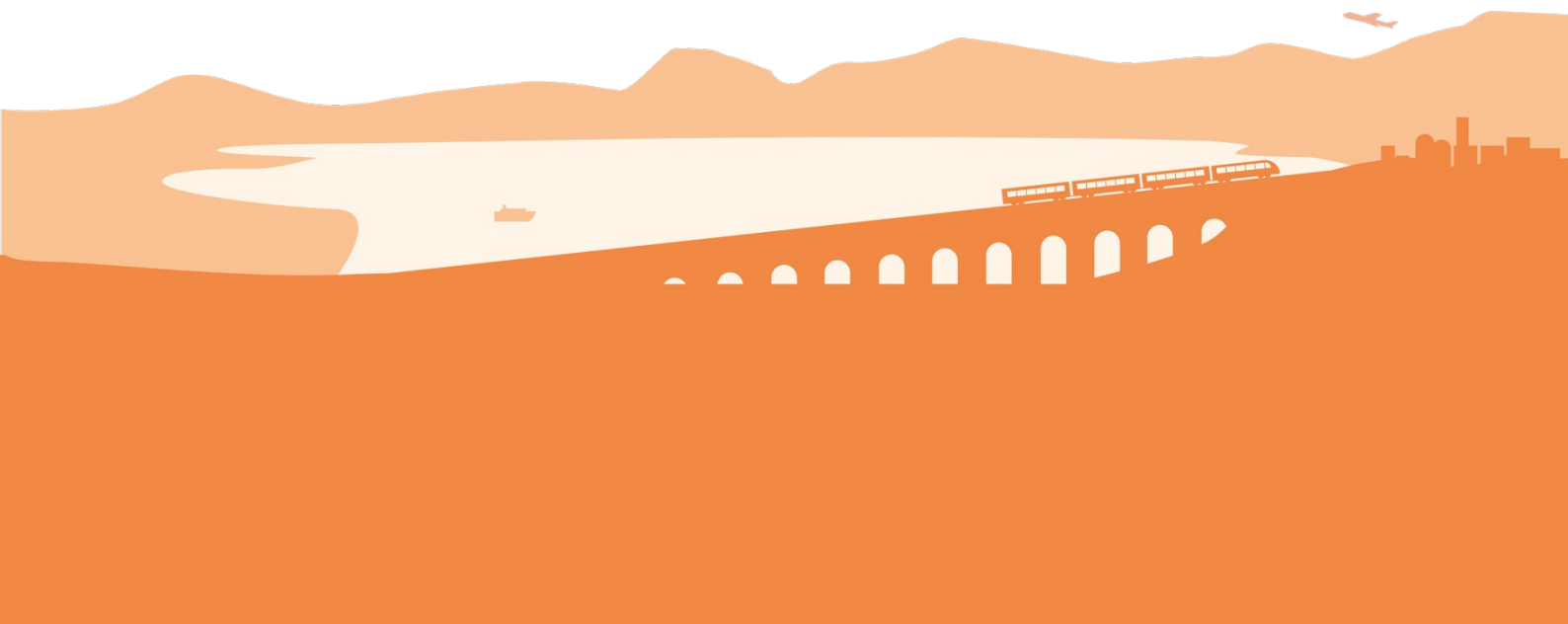
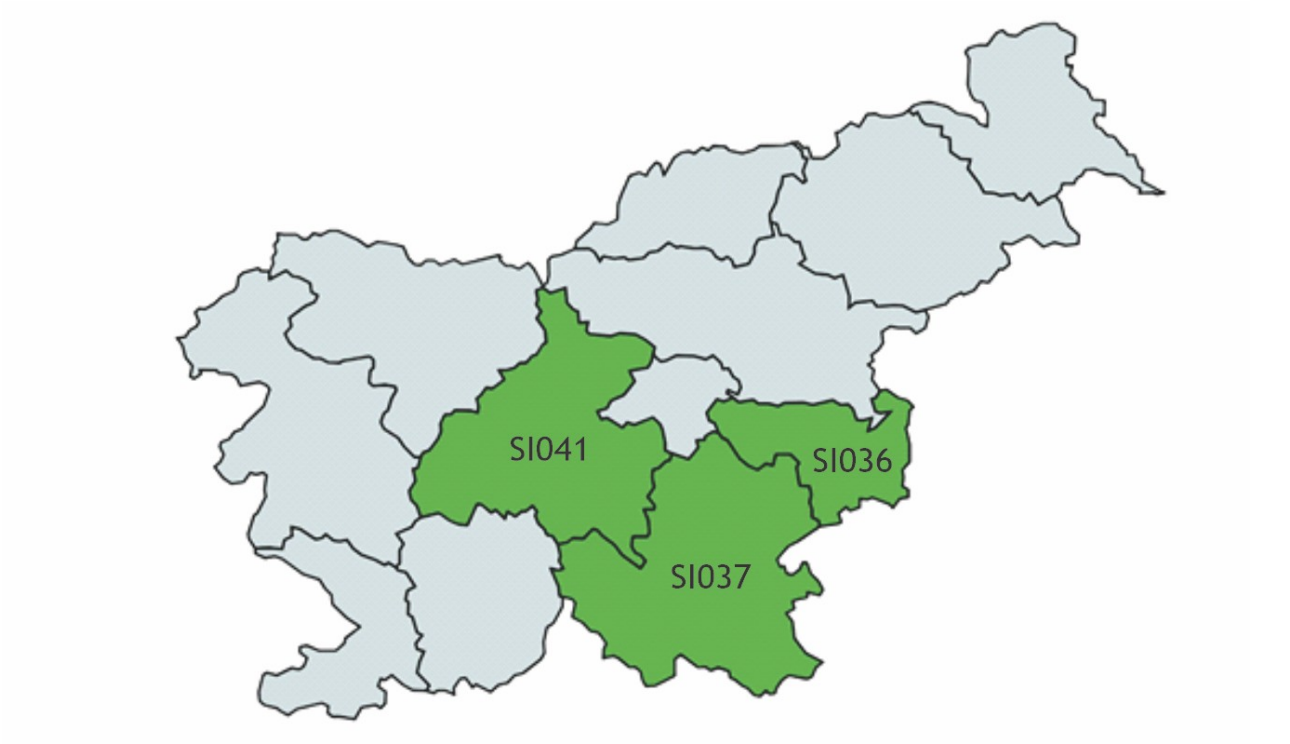


1. Introduction

The decision-making tool was applied to a specific area in Slovenia, which mostly included the Southeast Slovenian region (SI037) with a small part of the Lower Sava (SI036) and Central Slovenian regions (SI041) also included (Figure 1). The area was chosen because there are enough existing industrial sidings which vary in their length, usage, rail axle load capacity etc. and there are still enough industrial areas or potential industrial areas without an industrial siding.

Figure 1: NUTS areas (SI036, SI037 and SI041) where the decision making tool was applied to



2. Decision making tool for existing industrial sidings

Detailed explanation of the decision-making tool methodology is presented in the next paragraph.

We first focused on a wider region in Slovenia and examined the largest industries and companies present in the region. Most of the time the largest industries were already clumped up in an industrial area. We then looked at the closest railway stations and examined the station documents for information on any existing industrial sidings. From all the examined industrial sidings, we selected 7.

The selected sidings are:

- Industrial siding Revoz (Novo Mesto)
- Industrial siding Novoles Gozdno gospodarstvo Novo mesto d.d. PE Gozdarstvo Straža I. (Novo Mesto)
- Industrial siding Grča (Kočevje)
- Industrial siding Tanin (Sevnica)
- Industrial siding Vipap Videm Krško d.d. (Krško)
- Industrial siding Trimo Trebnje (Trebnje) and
- Industrial siding Hoja obrat Žaga (Škofljica).

The sidings are also shown in Figure 2.

The sidings were chosen so we could compare a variety of industries but at the same time the sidings were similar enough to have comparable values when analysed and weighted. The

industrial siding Revoz was chosen for its connection to the largest vehicle manufacturer in Slovenia which is also one of the biggest exporters. Industrial sidings Novoles, Grča and Hoja were chosen because they are all connected to companies that operate in the wood industry. The industrial siding Tanin was chosen because it connects to a company that operates in the petro-chemical industry, the industrial siding Trimo was chosen because it connects to a company that operates in the construction industry and finally the siding Vipap was chosen because it connects to a company that operates in the wood processing industry. All of the industrial siding serve for reception and expedition of wagon shipments, raw materials and finished products.

Figure 2: Locations of existing industrail sidings

After selecting the appropriate industrial sidings, we gathered the necessary information for every siding and used the decision-making tool to correctly weight every parameter. The sidings with their weighted parameters are presented in Figure 3.

Figure 3: Weighted existing industrial sidings

Main and Sub parameters	Weight	1 Revoz	2 Novoles	3 Grča	4 Tanin	5 Vipap	6 Trimo	7 Hoja
Use of siding (wagon delivery)	**8**							
Every working day	8	64						
Once a week	6		48	48		48		
Once a month	4							
Few times a year (less than 12)	2				16		16	16
Volume of the wagons per year	**9**							
Over 5000	9							
5000-2500	8							
2500-1000	7					63		
1000-500	4							
500-250	2	18						
250-0	1		9	9	9		9	9
Rail axle load category	**8**							
25.0 tons/axle	8							
22.5 tons/axle	6							
20.0 tons/axle	4	32		32		32	32	
18.0 tons/axle	2		16		16			16
Electrification	**7**							
Line and siding electrification	7							
Only line electrification	5				35		35	
Without electrification	3	21	21	21		21		21
All sidings length in total	**8**							
over 1000 m	8	64	64			64		
between 500 and 1000 m	6							
less than 500 m	4			32	32		32	32
Shunting traction vehicles	**8**							
Own locomotive, rail tractor, etc	8							
Provided by the rail carrier	6	48	48	48	48	48	48	48
Without possibility for shunting	1							
Direct connection to rail freight corridor	**7**							
Yes	7				49		49	
No	4	28	28	28		28		28
Required infrastructure investments	**10**							
No investment required	10	100		100	100		100	
Up to-250.000 EUR	8		80			80		80
250.000-500.000 EUR	6							
500.000-1.000.000 EUR	4							
Over 1.000.000 EUR	2							
Total possible weights (points)	**535**	375	314	318	305	384	321	250
%	100	70%	59%	59%	57%	72%	60%	47%
Order	**/**	**2**	**5**	**4**	**6**	**1**	**3**	**7**

The most appropriate siding is that with the highest number of points as shown in Figure 3. The sidings ranked by highest to lowest are:

1. Industrial siding Vipap Videm Krško d.d. (Krško)
2. Industrial siding Revoz (Novo Mesto)
3. Industrial siding Trimo Trebnje
4. Industrial siding Novoles Gozdno gospodarstvo
5. Industrial siding Grča
6. Industrial siding Tanin
7. Industrial siding Hoja obrat Žaga

The most appropriate siding was the Industrial siding Vipap, which has sub parameters quite similar to the other sidings, but it has by far the highest volume of wagons per year. The least appropriate siding was the Industrial siding Hoja obrat Žaga, which is actually temporarily closed and would need a decent amount of investments to be able to operate properly.

3. Decision making tool for the areas/locations without industrial sidings

Detailed explanation of the decision-making tool methodology is presented in the next paragraph.

Similarly, to the first method, we first focused on a wider region in Slovenia and examined the largest industries and companies present in the region. Most of the time the largest industries were already clumped up in an industrial area. We then looked at the closest railway stations and examined the station documents for information on any existing industrial sidings. From all the examined areas, we selected 6.

The selected potential industrial areas are:

- Industrial area Novo mesto West
- Industrial area Črnomelj
- Industrial area Ribnica
- Industrial area Mirna Peč
- Industrial area Grosuplje and
- Industrial area Ivančna Gorica

The potential industrial areas are also shown in Figure 4.

The potential industrial areas were chosen so we could compare a variety of different areas, at the same time the areas were similar enough to have comparable values when analysed and weighted. The area around Novo Mesto West was chosen, because it already has a developing industrial area, that is expected to develop and grow even further in the upcoming years. The industrial area in Grosuplje was chosen, because it has a potential for growth, but also because the area is close by to the main train station, which means that very little investments and siding building would be necessary for the connection to the main railway line. The industrial area in Črnomelj was chosen, because it has a somewhat developed industry and could potentially develop even further in the future. The potential industrial areas of Mirna Peč, Ribnica and Ivančna Gorica were chosen, because although smaller and less developed in comparison to Grosuplje, Črnomelj and Novo mesto, they still have a high potential for development and growth in the near future.

Figure 4: Potential industrial areas for the industrial sidings

After selecting the appropriate potential industrial area, we gathered the necessary information for every area and used the decision-making tool to correctly weight every parameter. The potential industrial areas with their weighted parameters are presented in Figure 5.

Figure 5: Weighted potential industrial areas

Main and Sub parameters	Weight	1 Novo Mesto	2 Črnomelj	3 Ribnica	4 Mirna Peč	5 Grosuplje	6 Ivančna Gorica
Potential Volume of the wagons per year	**9**						
Over 5000	9						
5000-2500	8						
2500-1000	7						
1000-500	4	36				36	
500-250	2		18	18			
250-0	1				9		9
Distance between area and railway station	**9**						
0-500 m	9					81	
500-1000 m	7			63			63
1000-2000 m	5	45	45		45		
Over 2000 m	3						
Line electrification	**7**						
Line electrification	7						
Without electrification	3	21	21	21	21	21	21
Direct connection to rail freight corridor	**7**						
Yes	7						
No	4	28	28	28	28	28	28
Required infrastructure investments	**10**						
Up to-250.000 EUR	10						
250.000-500.000 EUR	8				80	80	80
500.000-100.0000 EUR	6		60	60			
Over 1.000.000 EUR	4	40					
Total possible weights (points)	360	170	172	190	183	246	201
%	100	47%	48%	53%	51%	68%	56%
Order	**/**	**6**	**5**	**3**	**4**	**1**	**2**

The most appropriate potential industrial area is that with the highest number of points as shown in Figure 5. The potential industrial areas ranked by highest to lowest are:

1. Potential industrial area Grosuplje
2. Potential industrial area Ivančna Gorica
3. Potential industrial area Ribnica
4. Potential industrial area Mirna Peč
5. Potential industrial area Črnomelj and
6. Potential industrial area Novo Mesto.

The most appropriate potential industrial area is the industrial area Grosuplje, which would have a high potential volume of wagons per year, and would need an average amount of infrastructure investment, what sets it apart from the other industrial areas, is its closeness to a railway station. The least appropriate potential industrial area is the industrial area Novo Mesto West, which could also potentially have a high number of wagons per year, but it would require a lot more sidings being built and an abnormally high amount of investment.