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# ANNUAL REPORT OF THE INVESTIGATING BODY FOR RAIL TRANSPORT OF THE REPUBLIC OF SLOVENIA 2021



Ljubljana, 26 September 2022

## **INTRODUCTION**

The investigating body for rail transport investigates railway accidents and incidents in order to improve railway safety and prevent future accidents.

As of 15 June 2018, the investigating body acts in accordance with the provisions of Directive 2016/798/EC of the European Parliament and of the Council of 11 May 2016 on railway safety, which was transposed into Slovenian legislation with the provisions of the Railway Transport Safety Act, published in the Official Gazette of the Republic of Slovenia No. 30/2018 of 26 April 2018.

The annual report on safety investigations in rail transport in Slovenia for 2021 includes a presentation of the body's organisation, the legal bases for its operation, an overview of the accidents and incidents investigated, and recommendations issued and adopted in the past year.

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## **1 PRESENTATION OF THE ORGANISATION OF SAFETY INVESTIGATIONS**

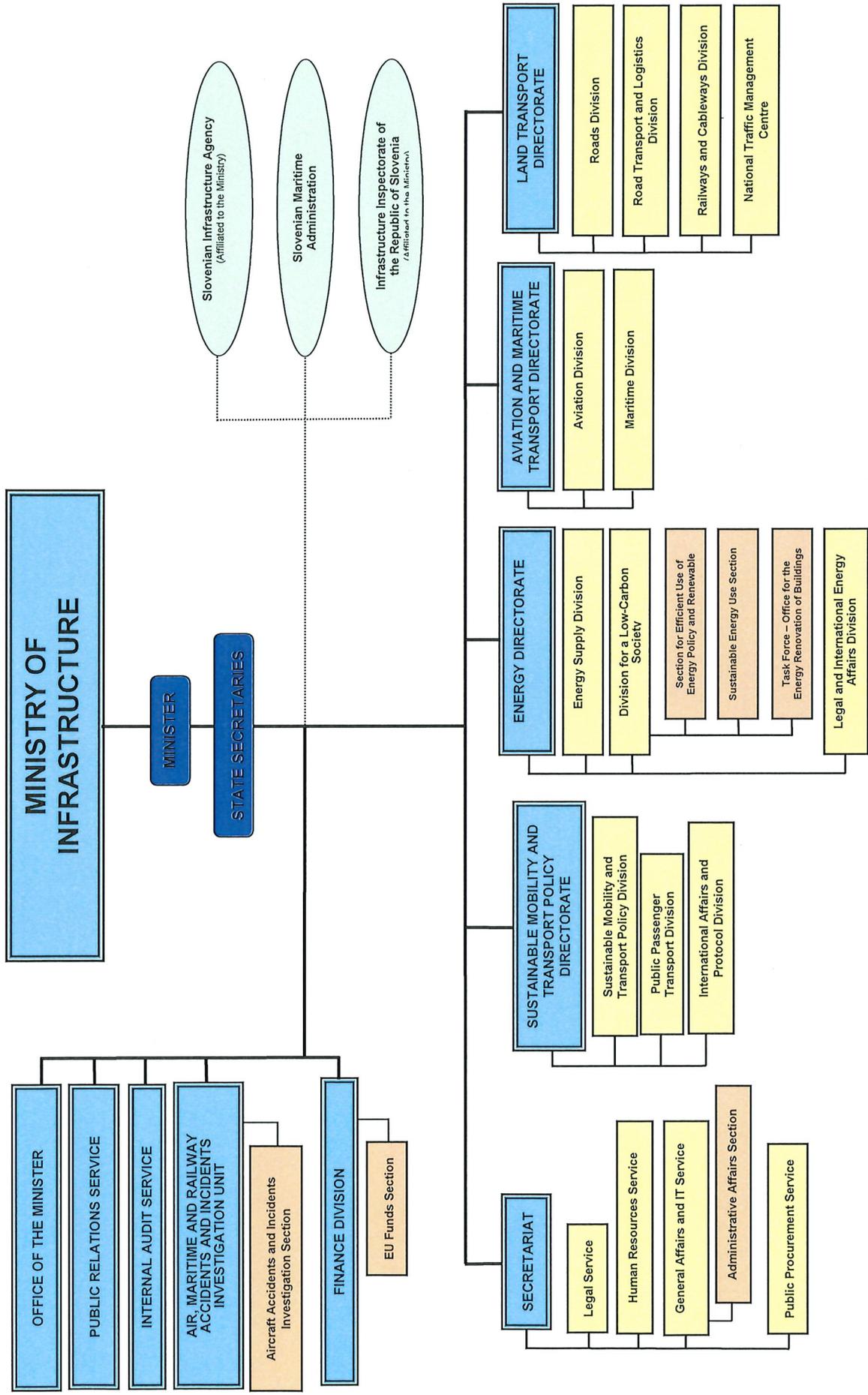
From its establishment in 2008 up to 22 February 2017, the investigating body operated as an independent organisational unit, the Railway Accidents and Incidents Investigation Unit.

On 22 February 2017, an organisational unit was formed within the Ministry of Infrastructure, consisting of investigating bodies for air, maritime and railway accidents and incidents. The Air, Maritime and Railway Accidents and Incidents Investigation Unit of the Ministry of Infrastructure reports directly to the Ministry leadership.

The investigating body for rail transport of the Air, Maritime and Railway Accidents and Incidents Investigation Unit has only one employee, who, in addition to conducting investigations, performs all other tasks defined through cooperation in the network of EU investigating bodies operating under the auspices of the European Union Agency for Railways (ERA).

As regards its organisation, the investigating body for rail transport is independent of the national safety authority and the regulator of railways. Its operation is funded from the budget.

The Air, Maritime and Railway Accidents and Incidents Investigation Unit is headquartered at the Ministry of Infrastructure, Langusova ulica 4, Ljubljana.



### **1.1. Legal basis (or legal framework)**

The legal basis for the operation of the investigating body for rail transport is provided by the provisions of Article 19 of the Railway Transport Safety Act (hereinafter: the ZZelP-1), Official Gazette of the Republic of Slovenia \, No. 30/2018 of 26 April 2018.

In terms of its organisation, funding and legal structure, the investigating body for rail transport is independent of the railway infrastructure manager, railway undertakings, the charging body, the allocation body and the notified body.

The investigating body is also functionally independent of the safety authority and the regulator of railways.

### **1.2. Role (description of the term of office) and objective (or mission)**

The investigator in charge of railway accidents and incidents at the Slovenian ministry responsible for transport is permanently appointed by contract, and conducts security investigations of serious accidents, accidents and incidents.

Investigations of serious accidents, accidents and incidents in rail transport are conducted with the objective of improving safety in rail transport. The investigator in charge of railway accidents and incidents at the Slovenian ministry responsible for transport cooperates with the investigating bodies of other railways within the EU in the network of national investigating bodies, which operates under the auspices of the European Union Agency for Railways – ERA.

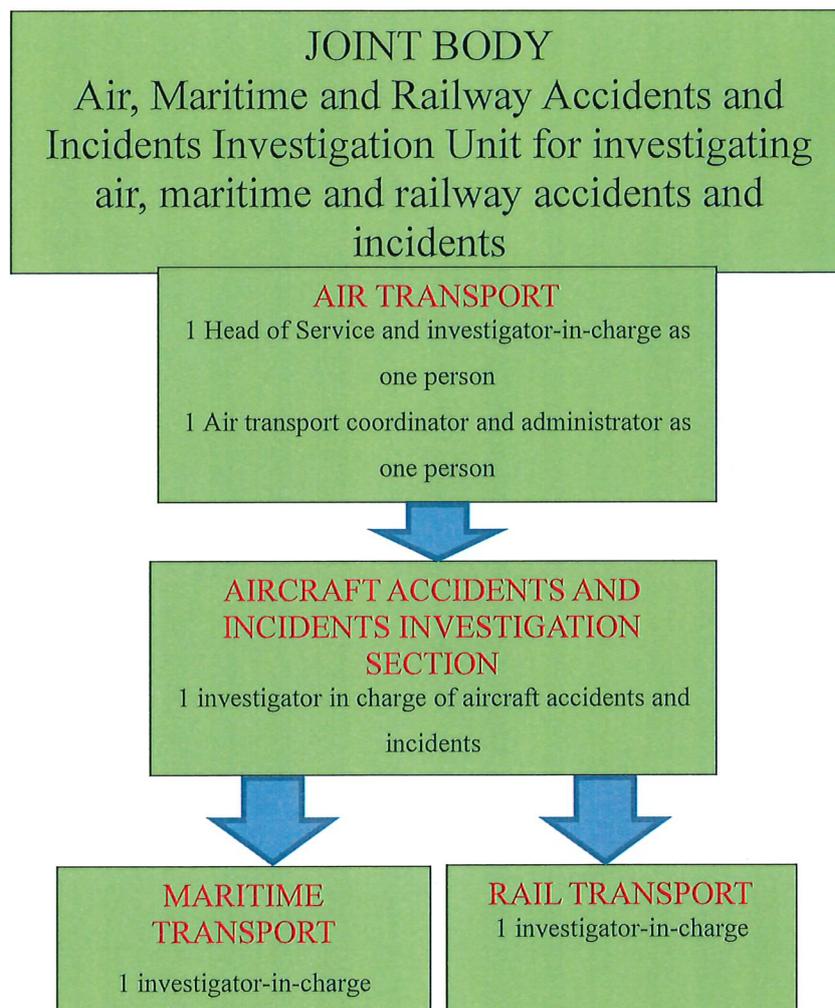
### **1.3. Internal organisation and subdivisions**

In terms of organisation, the Air, Maritime and Railway Accidents and Incidents Investigation Unit falls within the competence of the Ministry of Infrastructure, which is responsible for transport. In 2020, the new Aircraft Accident and Incident Investigation Section was formed within the Air, Maritime and Railway Accidents and Incidents Investigation Unit.

According to the internal job classification of the Ministry, the

Air, Maritime and Railway Accidents and Incidents Investigation Unit has one job description, i.e. the investigator in charge of railway accidents. In investigating accidents and incidents, the investigator-in-charge does not manage the budget funds allocated for investigations of railway accidents and incidents; this is the job of the budget item manager.

The investigator-in-charge is qualified to carry out all the functions required in an investigation procedure in the event of an accident or incident.

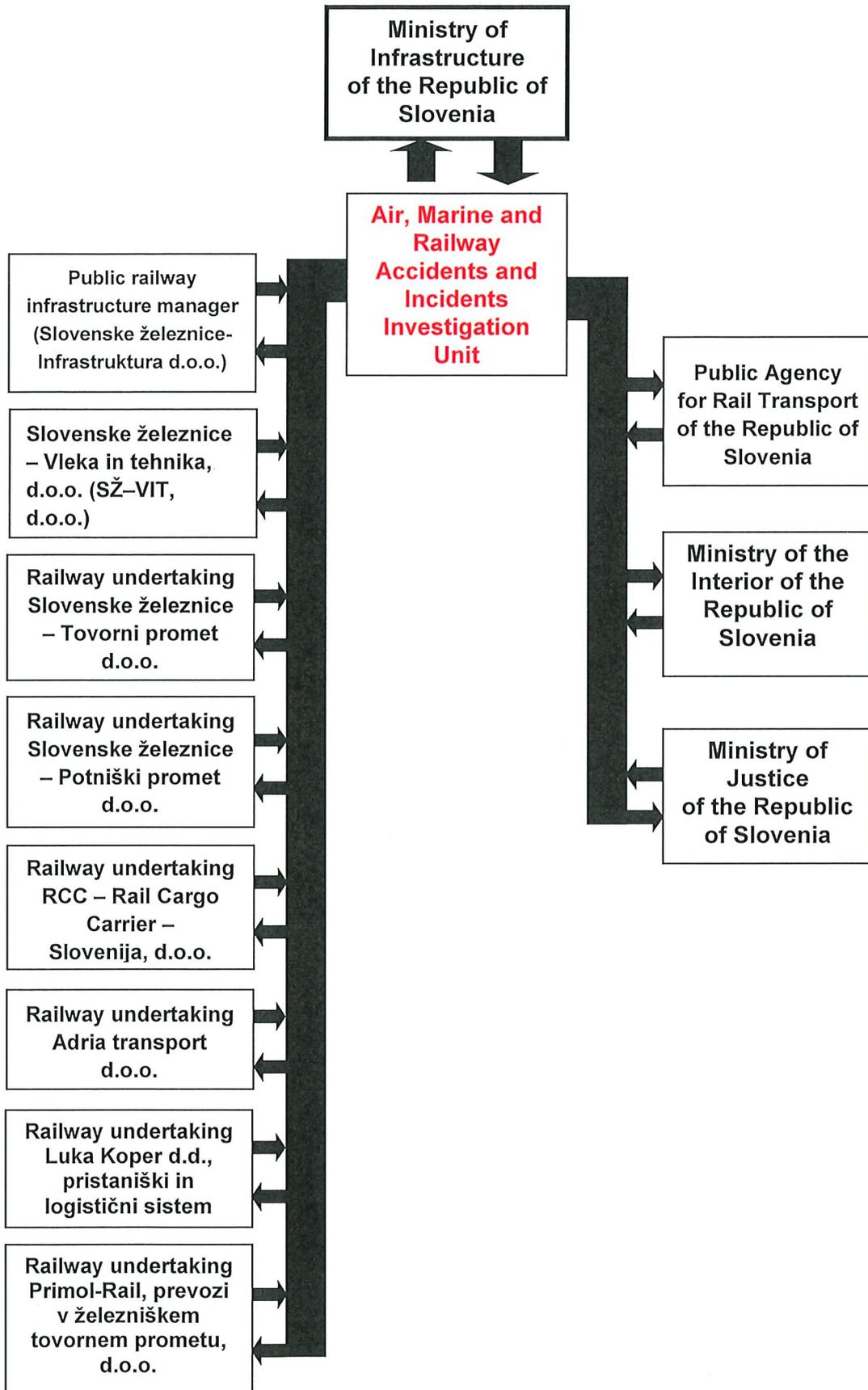


**1.4. Flow chart showing the position of the national investigating body**

The Air, Maritime and Railway Accidents and Incidents Investigation Unit at the ministry responsible for transport conducts separate safety investigations of accidents and incidents by transport mode, and operates independently.

The investigating body for rail transport cooperates with law enforcement authorities, other national investigation authorities and judicial authorities, the rail transport safety authority, the

public railway infrastructure manager, and all licensed railway undertakings in Slovenia.



If required, the investigating body also cooperates with all national investigating bodies of EU Member States that operate in the network of national investigating bodies under the auspices of the European Union Agency for Railways – ERA.

It acquires all information required to conduct investigation procedures from the aforementioned entities. Since railway accident investigations are conducted as openly and transparently as possible, all parties involved and having an interest are given the opportunity to make a statement on the event and to use the investigation results.

The independent operation of and budget funding for the Air, Maritime and Railway Accidents and Incidents Investigation Unit is ensured by the ministry responsible for transport. The ministry does not encroach on the independence of the investigating body in any manner.

Pursuant to Article 9, paragraph twelve, of the Rules on action to be taken in the event of serious railway accidents, accidents and incidents (Official Gazette of the Republic of Slovenia \, No. 50/2019 of 9 August 2019), the public railway infrastructure manager and railway undertakings are obliged to promptly notify the investigating body of any serious accidents, accidents and incidents involving rail transport.

The investigating body is notified by phone and subsequently in writing on the prescribed form, ID-1 or ID-2.

**1.5. *Philosophy of conducting accident investigations (the philosophy and approach to establishing accident investigations, and the level of mobility, readiness and timeliness)***

Article 21 of the Railway Traffic Transport Safety Act (ZZeIP-1, Official Gazette of the Republic of Slovenia \, No. 30/2018 of 26 April 2018), provides that the competent authority, undertakings, the public railway infrastructure manager and other persons involved shall enable the investigating body to carry out its tasks effectively, swiftly and independently. Past practice shows that the prescribed provisions are consistently observed.

Article 20 of the Railway Transport Safety Act (ZZeIP-1, Official Gazette of the Republic of Slovenia \, No. 30/2018 of 26 April 2018), provides that the investigating body must investigate all serious accidents.

The investigating body may, at its discretion, decide to investigate also those accidents and incidents which in similar conditions might have led to serious accidents, including technical failures of structural subsystems or of interoperability constituents of rail systems.

The investigating body takes into account all the provisions of the aforementioned Act.

Due to a lack of staff, the investigating body for rail transport must especially consider which accidents or incidents to investigate in addition to serious accidents.

Outside its regular working hours, the investigating body for rail transport must be constantly on standby.

To prove his or her identity, the investigator-in-charge has an official identity card with authorisations prescribed in Article 21, paragraph three of the Railway Transport Safety Act (Official Gazette of the Republic of Slovenia \, Nos 30/18 of 26 April 2018 and 54/21 of 9 April 2021). The general form of the official identity card is prescribed by the competent minister of transport.

The mobility of the investigator-in-charge is ensured by a car provided by the Air, Maritime and Railway Accidents and Incidents Investigation Unit or the Ministry of Infrastructure. If a car is not available, mobility is ensured by the investigator's personal road vehicle.

The aforementioned organisation of readiness and mobility ensure the appropriate response time to investigate the scene of an event and initiate the investigation procedure.

It takes the investigator-in-charge up to two hours by personal road vehicle to reach the most distant location of the railway network on traffic routes available from his or her place of residence or work, which in this case are located in central Slovenia.

## **2 THE INVESTIGATION PROCEDURE**

### **2.1 *Cases investigated: mandatory and non-mandatory pursuant to Articles 20 and 22 of the Directive on Railway Safety***

The investigating body investigates serious accidents, accidents and incidents involving rail transport. Pursuant to the provisions of the Railway Transport Safety Act (ZZeIP-1, Official Gazette of the Republic of Slovenia \, No. 30/2018 of 26 April 2018) and the Act Amending the Railway Transport Safety Act (ZVZeIP-1A, Official Gazette of the Republic of Slovenia \, No. 54/2021 of 9 April 2021), the investigating body must investigate all serious accidents and may, at its discretion, decide to also investigate those accidents and incidents which in similar conditions might have led to serious accidents, including technical failures of structural subsystems or of interoperability constituents of rail systems.

According to the Railway Transport Safety Act (ZZeIP-1, Official Gazette of the Republic of Slovenia \, No. 30/2018 of 26 April 2018), a serious accident is any collision or derailment resulting in one or more deaths, or in serious injuries to five or more persons, and in major material damage to the rolling stock or infrastructure, or major environmental pollution, and any other similar accident having a manifest impact on railway safety and safety management. Major damage is material damage that may be promptly assessed by the investigator in charge of railway accidents and is valued at not less than EUR 2 million.

The investigating body for rail transport in Slovenia observes the above legal provisions and investigates all serious accidents and accidents and incidents which in similar conditions might have led to serious accidents. Accidents and incidents are investigated at its discretion.

### **2.2 *Institutions participating in investigations (regularly or exceptionally)***

In the course of an investigation, the investigator in charge of railway accidents at the Slovenian ministry responsible for transport works together with law enforcement, minor offence and judicial authorities. The findings of the employees of the Ministry of the Interior and judicial authorities are regularly included in final reports.

If an investigation procedure requires chemical substances and other types of materials to be analysed, competent licensed independent organisations with lab facilities, such as the Jožef Stefan Institute, the Institute for Research in Materials and Applications, the Institute of Metal Constructions, and similar, are involved in the investigation.

The Institute of Forensic Medicine is included in investigations if victims' bodies must be examined.

If the necessity arises to reproduce verbal messages, experts of the railway infrastructure manager operating such devices are asked to join the investigation. The experts of the infrastructure manager are also involved if databases of signalling and safety installations must be analysed. The experts of undertakings are involved if databases of train movement records must be analysed.

### ***2.3 The investigation procedure or the approach of the investigating body (same as 1.5, but in more detail)***

Article 21 of the Railway Transport Safety Act (ZZeIP-1, Official Gazette of the Republic of Slovenia \, No. 30/2018 of 26 April 2018) provides that the competent authority, undertakings, the manager and other persons involved shall enable the investigating body to carry out its tasks effectively, swiftly and independently, which has so far been observed without exception by all involved.

Article 21 of the Railway Transport Safety Act (ZZeIP-1, Official Gazette of the Republic of Slovenia \, No. 30/2018 of 26 April 2018) sets out the responsibilities of the competent authority, undertakings, the manager and other persons involved towards the investigating body. They must ensure:

- a) immediate access to the location of any accident or incident and to the rail vehicles and infrastructure facilities involved, as well as to traffic management and signalling facilities and installations;
- b) prompt recording of evidence and the supervised removal of wreckage, infrastructure facilities and devices or their constituents for examination and analysis;

- c) access and use of recordings from devices which record verbal messages on the train, and a record of the operation of the signalling and traffic management system;
- č) access to the results of the examination of victims' bodies, including personal data (name and surname, data from employment and professional records, birth date and permanent or temporary residence) necessary to identify the causes and inform the victims involved and their relatives;
- d) access to the results of investigations of the train and other railway staff involved in any accident or incident, including personal data (first and last name, data from employment and professional records, date of birth and permanent or temporary residence);
- e) obtaining statements from the railway workers and other witnesses involved, including personal data (first and last name, records of employment and professional qualifications, date of birth and permanent or temporary residence) necessary to identify the causes and inform the victims involved and their relatives;
- f) access to all relevant information or records of the manager, undertakings involved, entities in charge of maintenance and the safety authority.

Article 20 of the Railway Transport Safety Act (ZVZeIP-UPB1, Official Gazette of the Republic of Slovenia \, No. 30/2018 of 26 April 2018) provides that the investigating body must investigate serious accidents.

The investigating body may, after careful consideration, decide to investigate also those accidents and incidents which in similar conditions might have led to serious accidents, including technical failures of structural subsystems or of interoperability constituents of rail systems. In its decision, it takes into account the following:

- a) the seriousness of the accident or incident;
- b) whether the accident or incident pertains to a series of accidents or incidents involving the entire system;
- c) the impact on railway transport safety at the European Union level, and

č) initiatives by managers, undertakings, safety authorities or Member States of the European Union.

The investigating body for rail transport takes into account all the prescribed provisions referring to investigation procedures. However, the investigating body is limited by a shortage of staff, and thus has to make additional decisions about taking up the investigation of accidents and incidents which need to be investigated.

### 3 INVESTIGATIONS

#### 3.1 Overview of investigations completed in 2021

In 2021, the investigating body for rail transport investigated four accidents:

- the collision of regional passenger train No. 3375 of the undertaking SŽ-Potniški promet, d.o.o., at a regulated level crossing with traffic signs at km 17.032 between the Tržišče station and the Mokronog loading station with a passenger road motor vehicle on 3 September 2020 at 07:01;
- the derailment of locomotive No. 1116 025 of the undertaking RCC Croatia, d.o.o., at switch No. 60, Dobova station, km 454.023, during shunting on 10 January 2021 at 10:21;
- the collision of train No. 518 of the undertaking SŽ-Potniški promet, d.o.o., with a minor girl on the left, station, side of the tracks at km 591.234, at the Maribor Tezno station in the area of the Maribor Tezno stop on 12 January 2021 at 15:08; and
- the collision of regional passenger train No. 2807 of the undertaking SŽ-Potniški promet, d.o.o., with an elderly man on the correct, left, track between the Sevnica and Blanca stations at km 484.218 on 29 March 2021 at 09:32.

Type of investigated event	Number of events	Number of victims		Damage in EUR (estimated)	Trends in comparison with 2020
		Fatalities	Severely injured		
Train collision	0	0	0	EUR 0	0 = 0
Train derailment	0	0	0	EUR 0	0 = 0
Collision – shunting	0	0	0	EUR 0	0 = 0
Derailment – shunting	1	0	0	EUR 206,158.54	1 > 0
Other	3	2	1	EUR 57,000.00	3 < 5

#### 3.2 Investigations initiated and completed in 2021

In 2021, three accident investigations were completed out of the 13 initiated. The investigation procedures of four train derailments, three accidents at level crossings, one shunting collision, one derailment during shunting, one collision

with a person and one collision between a train and machinery have been completed, and the final reports are being drafted. All reports on these investigations will be issued by the end of 2022.

All accident and incident investigations were initiated by the investigating body for rail transport based on Article 20(2) of Directive 2016/798 of the European Parliament and of the Council, Official Journal of the European Union, L 138/102 of 26 May 2016.

<b>Investigations completed in 2021</b>				
Date of accident or incident	Type of accident or incident	Place of accident or incident	Legal basis	Investigation completed
24 September 2020	The collision of passenger train No. 3257 with a passenger road motor vehicle	Between the Tržišče station and the Mokronog loading station, level crossing at km 17.032	Article 20 of the ZZeIP	24 September 2021
10 January 2021	The derailment of the locomotive during shunting	Switch No. 60, Dobova station, at km 454.023	Article 20 of the ZZeIP	10 January 2022
12 January 2021	The collision of IC passenger train No. 518 with a minor girl	Left, station, side of the tracks, Maribor Tezno, at km 591.234	Article 20 of the ZZeIP	12 January 2022
29 March 2021	The collision of regional passenger train No. 2807 with an elderly man	Left track between the Sevnica and Blanca stations at km 448.218	Article 20 of the ZZeIP	25 August 2022

### **3.3 Research studies (or security studies in cases of serious accidents) ordered and completed in 2021**

Whereas no serious accidents took place in 2021 in the railway network area in Slovenia, there were 12 accidents. In these 12 accidents, three people died of their injuries and one person was seriously injured in an accident.

Two studies were conducted in 2021 to establish the cause of the drive axle breaking on two DMU (diesel multiple unit) trains, series 813.

On 4 March 2022, the investigating body for rail transport of the Ministry of Infrastructure gave the Institute of Metal Constructions two pieces of the drive axle, DMU 813/814-107, which broke on 16 December 2021 at 21:25 during the movement of train No. 9704 on the right track of a two-track line between the Grobelno and Ponikva stations.

On 4 March 2022, the investigating body for rail transport of the Ministry of Infrastructure gave the Institute of Metal Constructions two pieces of the drive axle, DMU 813/814-130, which broke on 21 December 2021 at 15:44 during the movement of train No. 3701 on a one-track line between the Stranje and Rogatec stations.

### ***3.4 Summaries of investigations completed in 2021. Brief descriptions, photographs and diagrams, and safety studies***

#### **The collision of regional passenger train No. 3375 with a passenger road motor vehicle at a regulated level crossing with traffic signs, level crossing 17.0, km 17.032, between the Tržišče station and the Mokronog loading station, on 3 September 2020**

On 3 September 2020 at 07:01, at the regulated level crossing with traffic signs 17.0, at km 17.032, between the Tržišče station and the Mokronog loading station, regional passenger train No. 3375 of the undertaking SŽ-Potniški promet, d.o.o., from Sevnica to Trebnje, hit a passenger road motor vehicle.

Regional line No. 81 Sevnica–Trebnje is a one-track, non-electrified line with a GSM-R system. It has a category C-2 line capacity. The line has a two-way traffic regime with trains announced at intervals at train announcing points.

The inspection of the accident revealed that train No. 3375 from Sevnica to Trebnje collided head-on with the rear right door of the passenger road motor vehicle, a Renault Megan Grandtour, driving from Martinja vas to Gorenje Jesenice. Due to the collision, the road vehicle was knocked to the bank of the Jeseniščica stream.



Image 1: The red arrow shows the direction of the train and the yellow arrow shows the direction of the passenger road motor vehicle.

Before the accident, the train stopped at the Pijavice stop and then continued its journey towards the Trebnje station.

The altitude of the point of collision was 232 m.

The local road from Martinja vas to Gorenje Jesenice approaches the railway track at a 65° angle.

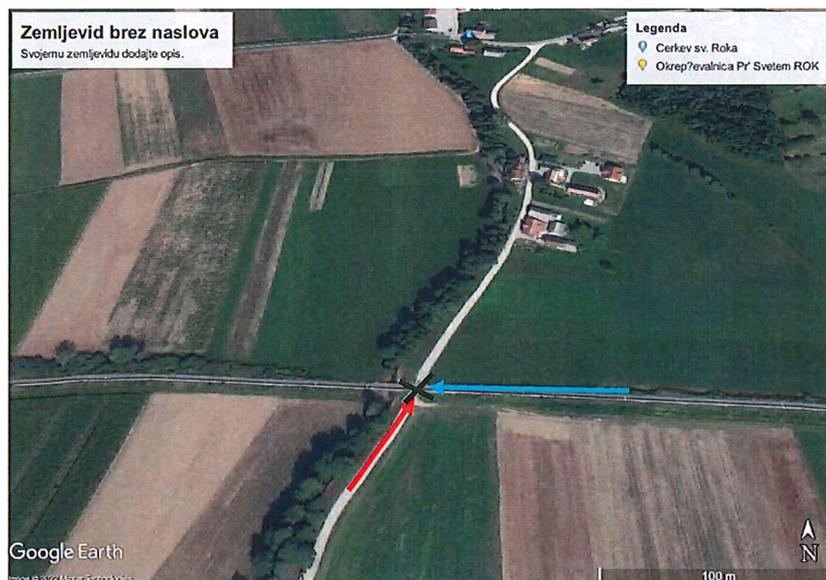


Image 2: The black cross shows the point of collision, the blue arrow shows the direction of the train, and the red arrow shows the direction of the passenger road motor vehicle.

The inspection revealed that the road users' view of the track from the road in the direction of the train involved in the accident was blocked by high vegetation and a cornfield with crops 2.2 m high. At the time of the accident, the corn crops growing along the left side of the track were 11 m away from the level crossing and the vegetation on the bank of the track was 65 m away. At a certain point during the train's journey from the Tržišče station to the Mokronog loading station, the vegetation on the bank of the track before the level crossing concealed the entire DMU 713/715-125.

After the collision, the front end of the road vehicle hung off the concrete edge of a railway bridge 12.6 m from the point of the collision between the train and the side of the passenger vehicle, and its rear end was driven into the ground on the right bank of the stream.

After the head-on collision, the train stopped at km 17.252.

Train No. 3375 was a DMU 713/715-125, weighting 60 t, measuring 47 m, with 8 axles.

### **Causes:**

The direct cause of the collision of regional passenger train No. 3375 on 3 September 2020 at 07:01 at the regulated level crossing 17.0 with traffic signs between the Tržišče station and the Mokronog loading station at km 17.032 was the high vegetation growing along the track and the cornfield that blocked the view of the track just before the level crossing.

The indirect cause can be attributed to the noise-reducing properties of the vegetation along the track, which was at its thickest at the time of the accident. The vegetation dampened the sound of the train whistle that the driver sounded 500 m before the level crossing at signal mark 206: "Attention, level crossing", with signal 63: "Attention", to warn road users of an oncoming train approaching the level crossing.

### **Consequences:**

The consequences of the collision of regional passenger train No. 3375 at the regulated level crossing 17.0 with traffic signs between the Tržišče station and the Mokronog loading station on 3 September 2020 at 07:01 were:

- the injury of the 30-year-old driver of the road passenger motor vehicle, who was taken to the Novo mesto hospital for treatment in an

ambulance;

- damage to the front of the control unit of the DMU 715-125 (a completely destroyed automated coupler, a heavily damaged bottom right side of the front, minor damage to the right side of the control unit of the DMU 715-125, the stair of the right-hand passenger doors, scratched front passenger doors, a scratched right bearing cover on the first axle of the first bogie in the direction of train movement);
- A completely destroyed road passenger motor vehicle, a Renault Megan Grandtour.

**Recommendation:**

To prevent similar accidents in the future, the following measures should be implemented.

The public railway infrastructure manager SŽ – Infrastruktura, d.o.o.:

- immediately after the accident, was advised to remove all vegetation in the visibility triangle of the level crossing along the railway track in the immediate vicinity of level crossing 17.1 between the Tržišče station and the Mokronog loading station. The vegetation blocking the road users' view of the track should be removed on a regular basis so as not to exceed the height of the track ballast;
- during the vegetation growth cycle, the growth rate should be monitored.



Image 3: The red arrow shows the completely destroyed automated coupler of train No. 3375 and the yellow arrow shows the front right side of the control unit of DMU 715-125.

An analysis of the road traffic on the level crossing and the existing road and

railway infrastructure revealed that by obstructing the view in the visibility triangle the vegetation along the track in the immediate vicinity of the level crossing posed a great risk to level crossing users when crossing the danger zone of the track.

The vegetation also has a sound damping effect, due to which road users crossing the track are completely dependent on their visual awareness of the track.

**The derailment of E-locomotive No. 1116 025 of the undertaking RCC Croatia, d.o.o., during shunting at switch No. 60, Dobova station, km 454.023, on 10 January 2021 at 10:21**

On 10 January 2021 at 10:21, at switch No. 60, Dobova station, km 454.023, during shunting from track No. 9 to track No. 4, locomotive No. 9181 1116 025-8 of the undertaking RCC-Croatia, d.o.o., derailed.

The investigating body for rail transport of the Ministry of Infrastructure was informed of the accident by the chief dispatcher of SŽ-Infrastruktura, d.o.o., on 10 January 2021 at 10:50.

Immediately after the event, the investigator in charge of railway accidents and incidents inspected the scene of the accident.

The inspection of the accident revealed that locomotive No. 91 81 1293 001-4 of the undertaking RCC-Ljubljana, d.o.o., was pushing locomotive No. 9181 1116 025-8 of the undertaking RCC-Croatia, d.o.o., from track No. 504 in the direction of track No. 4. During shunting at switch No. 60, the first axle of the first locomotive in the direction of movement of train composition No. 9181 1116 025-8 of the undertaking RCC-Croatia, d.o.o., diverged in the direction of track Nos 7 to 11, and the second axle of the first bogie forked with both wheels between the switch rails and the stock rails. The pushed locomotive, No. 9181 1116 025-8, of the undertaking RCC-Croatia, d.o.o., then derailed with its right wheel in the direction of the rolling stock at km 454.021,6 and with the left wheel at km 454.018. The point of derailment of the right wheel was established based on the signs of damage to the spacer between the switch rail and the stock rail above the 19<sup>th</sup> sleeper of the switch, and the point of derailment of the right wheel based on the signs of damage to the spacer between the switch rail and the stock rail above the 14<sup>th</sup> sleeper of the switch, viewed from the top of the switch rails.

After the derailment of the front of locomotive No. 9181 1116 025-8 of the undertaking RCC-Croatia, d.o.o., the rolling stock stopped before the actuation system of switch No. 57 at km 453.963,2.

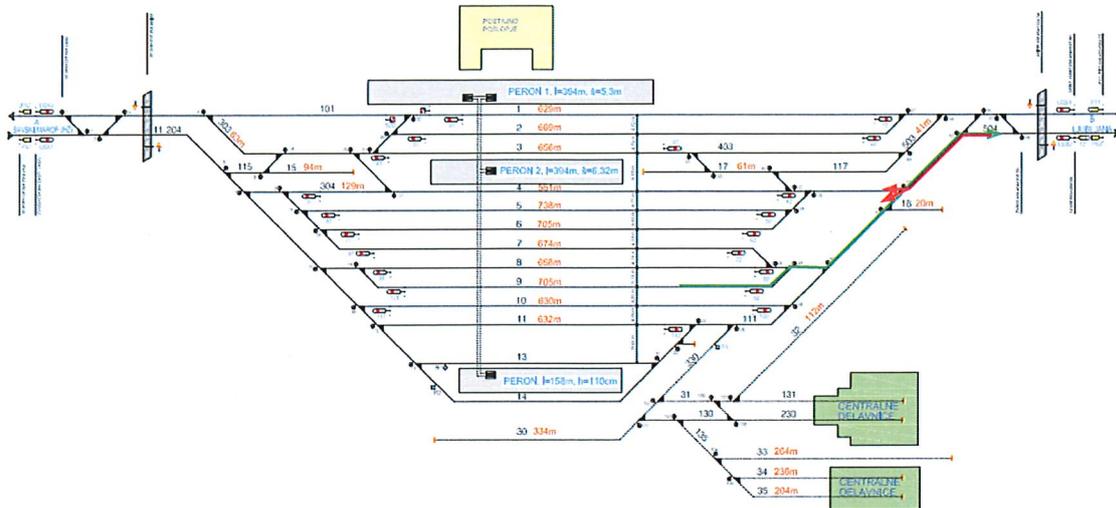


Image 1: The green arrow shows the shunting from track No. 9 in the direction of track No. 504 and the red arrow shows the shunting from connecting track No. 504 towards switch No. 60.

### Causes:

The direct cause of the accident – the derailment of the pushed E-locomotive 91 81 1116 025-8 A-ÖBB of the undertaking RCC-Croatia, d.o.o., during shunting with coupled E-locomotive 91 81 1293 001-4 A-ÖBB of the undertaking RCC-Slovenia, d.o.o., at switch No. 60, Dobova station, on 10 January 2021 at 10:21 was the forking of the second axle of the first bogie of E-locomotive 1116 025, which means that movement over the switch happened at the moment when the switch rails of switch No. 60 switched from a diverging to a straight line (the switching of switch rails from tracks Nos 7 to 14 in the direction of track No. 4).

The signs of derailment revealed that the first axle of the first bogie of the pushed locomotive 1116-001 moved in the direction of tracks Nos 7 to 14, and the second axle moved with the right wheel into an empty space between the right switch rail and the right stock rail while the left wheel moved onto the left stock rail of switch No. 60.

The indirect cause of the accident can be attributed to poor communication between the personnel of the infrastructure manager – the signalman at the Dobova station – and the personnel of the undertakings – the E-locomotive drivers.

### **Consequences:**

The accident resulted in damage to the following property:

- E-locomotive 91 81 1116 025-8 of the undertaking RCC-Croatia, d.o.o. (both bogies, all 4 axles derailed, coupler, buffers);
- E-locomotive 91 81 1293 001-4 A-ÖBB of the undertaking RCC-Ljubljana, d.o.o. (the first two axles of the first bogie in the direction of movement, coupler, buffers);
- switch No. 60 (the connecting rails of the railway frogs, spacers, sleepers, insulated contact);
- switch No. 57 (fastenings, connecting rail sleepers, spacers, insulated contact).

### **Recommendations:**

- The Undertaking SŽ – Infrastruktura, d.o.o., should:
  - 1 draft a plan of the risks involved in shunting at the Dobova station, which should include monitoring the set shunting paths and carrying out shunting operations, particularly where visibility is reduced due to the specific conditions of the area;
  - 2 upgrade its video system by setting up a camera or recording device on the "B" side of the station, which will enable the monitoring of shunting in the direction of the station building;
  - 3 move the camera on the "B" side of the station closer to the switch area to improve the monitoring of shunting in the switch area on the "B" side of the station;
  - 4 prescribe protocols for notifying the PSCTs (staff or persons executing safety-critical tasks) of the order of shunting at the Dobova station.
- The undertaking Rail Cargo Carrier Croatia, d.o.o., should:
  - 5 draft a plan for the management of risks during shunting at the Dobova station for the manipulation of a locomotive that must be moved under the overhead line at the nominal voltage of the locomotive;
  - 6 during regular periodic training, train drivers should be informed of the shunting risks at the Dobova station.

Stations with signalling and safety installations for setting shunting paths allowing instant changes that are not registered by the device are exposed to greater risk. At stations where shunting is permitted or prohibited by shunting

signals, an additional protocol must be established for communication between the signalman and the train driver.

Enabling constant control over the setting of shunting paths and shunting operations is extremely important for safe traffic management and reduces shunting risks.

**The collision of IC passenger train No. 518 with a minor girl on the left, station, side of the tracks, the Maribor Tezno station in the area of the Maribor Tezno stop at km 591.234 on 12 January 2021 at 15:08**

On 12 January 2021 at 15:08, IC train No. 518 of the undertaking SŽ-Potniški promet, d.o.o., on the left, station, side of the tracks, the Maribor Tezno station in the area of the Maribor Tezno stop at km 591.234,9, hit a minor girl.

The investigating body for rail transport of the Ministry of Infrastructure was informed of the accident by the chief dispatcher of SŽ-Infrastruktura, d.o.o., on 12 January 2021 at 15:22.

Immediately after the event, the investigator in charge of railway accidents and incidents inspected the scene of the accident.

The inspection of the accident revealed that train IC No. 518 with scheduled departure from the Ljubljana station at 13:12 was moving on the correct, left, track of the Zidani Most–Maribor section, line No. 30. Train No. 518 is not scheduled to stop between the Pragersko and Maribor stations.

At island platform 1, parallel with the exit leading to the platform from the underpass of the Maribor Tezno stop, train No. 518, travelling at 128 km/h, i.e. 35.55 m/s, hit the left side of a minor girl with the front left corner of EDMU (electro-diesel multiple unit) 310-003.

At the approach of the Maribor-Tezno stop, the train driver noticed two girls standing in front of the security barrier between the left and the right tracks. As soon as he saw the girls, he sounded the whistle with signal 63 "Attention", while activating the high-speed brake, as he estimated during the approach that the girl moving towards the left track would be unable to reach the platform outside the danger zone in time. The girl involved in the accident was moving away from the tracks towards platform 1, in the direction of the left track, on which train No. 518 was approaching, and the other girl was moving towards platform 2 in the direction of the right track.

A moment after the high-speed brake was activated, the train hit the girl. The

train's scheduled and prescribed speed in the collision area is 130 km/h.

From the point of collision, the girl was knocked 13 m to the left, next to the concrete barrier, against the pole of the overhead lines on platform 1 at km 591.247,8.

After the collision, IC train No. 518 stopped on the left track between the Maribor Tezno and Maribor stations, 564 m from the point of collision, at km 591.798.

The minor girl died at the scene of the accident.

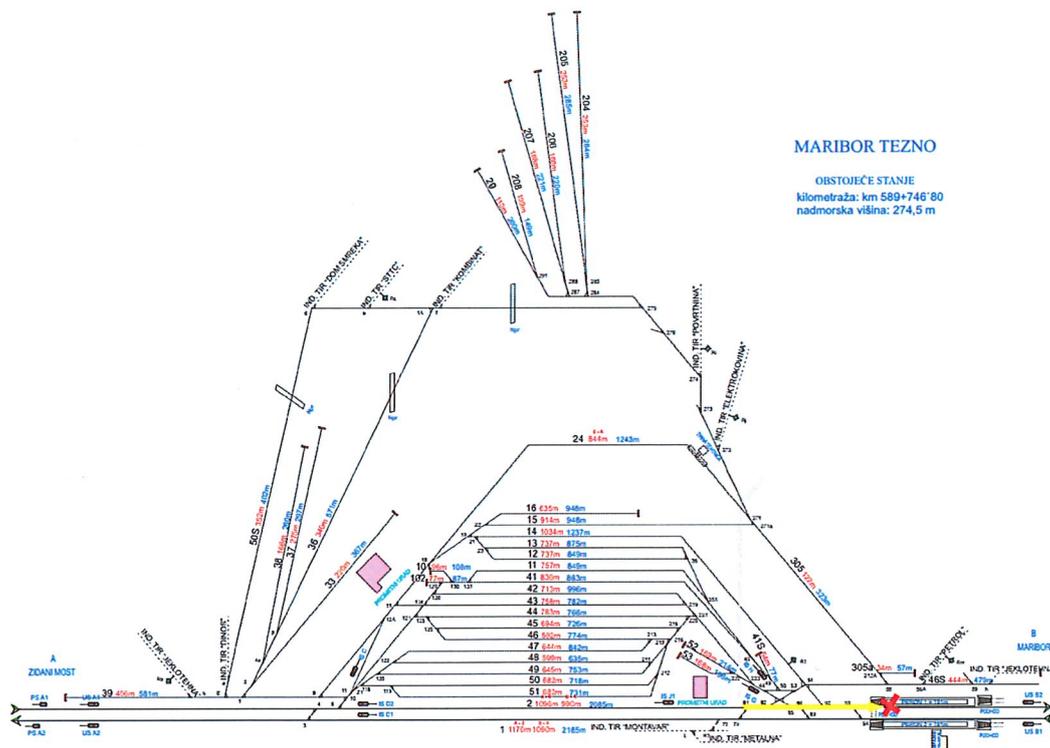


Image 1: The yellow arrow shows the direction of movement of IC regional train No. 518 on the left, station, side of the tracks and the red arrows shows the point of collision with the minor girl.

### Causes:

The direct cause of the accident – the collision of IC train No. 518 with a minor girl on the left, station, side of the tracks, at the Maribor Tezno station in the area of the Maribor Tezno stop on 12 January 2021 at 15:08, was the tempting of fate by the two young girls, who were standing between the left and right tracks at the time of the movement of the train.

Based on the marks on the side supporting wall on platform 1 of the Maribor Tezno stop and the signs of damage to the EDMU, it is safe to assume that the

girl was trying to avoid the collision with the oncoming train but was unfortunately unable to do so.

The indirect cause of the accident can be attributed to teenage frolicking, recklessness and unfamiliarity with the various characteristics of moving trains, which led to the wrong assessment of the speed of the oncoming train. It is reasonable to assume that the girls were surprised by the speed of the approaching train.

### **Consequences:**

The train accident resulted in the death of a barely 14-year-old girl.

It also caused damage to EDMU 310-003:

- EDMU 94 79 6 310 003-9 of the undertaking SŽ-Potniški promet, d.o.o. (the glass fibre cover in the front left corner, a crack on the left side of the front spoiler, paint damage on the left side of the cab);

### **Recommendations:**

To prevent similar accidents in the future:

- the Undertaking SŽ – Infrastruktura, d.o.o., should:
  - 1 further secure the platform of the Maribor Tezno stop by building a high barrier directing passengers and other persons to use the underpass;
  - 2 put up additional warning signs in the area of the Maribor Tezno stop, warning of the danger of crossing and walking in the danger zone of the tracks.

Barriers and signs have a proven psychological effect on people, making them aware that the space behind the barrier is private, while warning signs alert people to increased risk in this area.

### **The collision of regional passenger train No. 2807 with an elderly man on the left track between the Sevnica and Blanca stations at km 484.218 on 29 March 2021 at 09:32**

On 29 March 2021 at 09:32, regional passenger train No. 2807 of the undertaking SŽ-Potniški promet, d.o.o., hit an elderly man on the left track between the Sevnica and Blanca stations at km 484.218.

The investigating body for rail transport of the Ministry of Infrastructure was informed of the accident by the chief dispatcher of SŽ-Infrastruktura, d.o.o., on 29 March 2021 at 09:39.

Immediately after the event, the investigator in charge of railway accidents and incidents inspected the scene of the accident.

The inspection of the accident revealed that regional passenger train No. 2807, with scheduled departure from the Maribor station at 07:25, was running on the correct, left, track of the Zidani Most–Dobova section, line No. 10.

After leaving the Sevnica station at 09:31 with an 11-minute delay, train No. 2807 hit the right side of an elderly man with the front right side of EDMU 312-117/118 317-109.

The train driver said that, upon approaching the scene of the incident, he noticed a man with a dog on a leash crossing the tracks. The dog was pulling hard on the leash and the man was having trouble keeping up. He was crossing the tracks from the right side of the right track. As soon as he saw where the man was headed, the driver sounded the whistle with signal 63 "Attention", while activating the high-speed brake. Upon approaching the man, the driver realised he would not be able to prevent a collision, as the man had to cross both tracks, the right one and the left one.

Moments after the high-speed brake was activated, the train hit the man. The train's scheduled and prescribed speed in the collision area is 100 km/h and was not exceeded, as the train was going 94 km/h. After the head-on collision, the train stopped on the correct, left, track between the Sevnica and Blanca stations, at km 483.963.

Following the collision, the man bounced off and hit signal sign 59 "Brake before level crossing", then landed on the grass under the tracks at km 483.197.

The elderly man died at the scene of the accident.



Image 1: The yellow square shows the marks and minor damage to the sheet metal

and paint on the front of EDMU 312-118 caused by the collision of train No. 2807 with the 72-year-old man.

**Causes:**

The direct cause of the accident – the collision of regional passenger train No. 2807 with an elderly man on the left track between the Sevnica and Blanca stations at km 484.218 on 29 March 2021 at 09:32 – was an unfortunate set of circumstances that occurred when the man was walking his dog. The man's dog was pulling the leash with such force that the man could barely keep up. As the bank near the track was well-trodden, it is safe to assume that the man used this path daily to walk his dog. It is likely that, upon noticing the train, the dog started pulling the leash even harder and, as the man did not let go, the dog pulled him into the path of the train.

**Consequences:**

The train accident resulted in the death of a 72-year-old man.

Minor damage to EDMU 312-118:

- EDMU 94 79 6 312 118-3 of the undertaking SŽ-Potniški promet, d.o.o. (a scratched right front side and scraped front right corner).

**Recommendations:**

To prevent similar accidents in the future, the undertaking SŽ – Infrastruktura d.o.o., should:

- 1 study the possibility of building a noise barrier that will prevent the tracks from being crossed in this area;
- 2 with the consent of the owners of the properties bordering the tracks, build a walkway to the culvert under the tracks at km 494.340, on the right side of the tracks, for people whose properties border the tracks, and a pedestrian crossing over the culvert to the walking trail between the river Sava and the left bank of the tracks.

The crossing of tracks in this area is very current issue, as there is a walking trail on the other side of the tracks between the river Sava and the left side of the tracks that is used daily by many residents of Sevnica. Given that the path on the bank of the tracks between the houses and the tracks is well-trodden, it is reasonable to assume that it is used daily to cross the tracks.

**3.5 An explanation of and introduction and/or background to**

## ***investigations***

At the time of the publication of the 2021 annual report, the investigating body for rail transport had not yet completed the investigation procedures regarding nine accidents that occurred in 2021. The time limit for completing an investigation prescribed in Article 6 of Directive (EU) 2016/798 of the European Parliament and of the Council of 11 May 2016 expired for one accident.

<b>Uncompleted investigations initiated in 2021</b>					
<b>Date of accident</b>	<b>Type of accident</b>	<b>Place of accident</b>	<b>Legal basis</b>	<b>Reason the investigation was not completed or was suspended</b>	<b>Who, why, when (decision)</b>
12 August 2021	The collision of train 76005 with a person	the left track between the Ponikva station and the Dolga Gora stop at km 551.750	Article 20 of the ZVZeIP RS	Procedures delayed due to the epidemic; the investigation is to be completed in 2022	12 August 2022
14 September 2021	The collision of passenger train No. 314 with machinery	The level crossing between the Kranj and Podnart stations at km 604.280	Article 20 of the ZVZeIP RS	The time limit has not yet expired.	15 September 2021
7 October 2021	The collision of freight train No. 47402 with machinery	The level crossing between the Pesnica and Šentilj stations at km 602.214	Article 20 of the ZVZeIP RS	The time limit has not yet expired.	7 October 2022

23 October 2021	The collision of shunting D-locomotive 646-001 with E locomotive 363-008	Crossover No. 231-CD, the Koper Tovorna station at km 29.164	Article 20 of the ZVZeIP RS	The time limit has not yet expired.	23 October 2022
29 October 2021	The derailment of car 338779334 48-3 during the movement of the train composition	switch No. 49, the Sežana station at km 679.198	Article 20 of the ZVZeIP RS	The time limit has not yet expired.	29 October 2022
8 November 2021	The collision of a man with the side of train No. 2413	The level crossing between the Ljubljana Vižmarje and Ljubljana Šiška stations at km 566.189	Article 20 of the ZVZeIP RS	The time limit has not yet expired.	8 November 2022
16 December 2021	The derailment of passenger train No. 9704	Between the Grobelno and Ponikva stations at km 543.659	Article 20 of the ZVZeIP RS	The time limit has not yet expired.	16 December 2022
17 December 2021	The derailment of cargo train No. 45882	Switch No. 3, the Črnotice station at km 6.060	Article 20 of the ZVZeIP RS	The time limit has not yet expired.	17 December 2022
21 December 2021	The derailment of passenger train No. 3701	Between the Stranje and Rogatec stations at km 37.971	Article 20 of the ZVZeIP RS	The time limit has not yet expired.	21 December 2022

### 3.6 Accidents and incidents under investigation in the past five years (2017–2021)

[A table of railway accidents investigated between 2017 and 2021, i.e. serious accidents, accidents, incidents and safety studies, with data from 2017 to 2021, by type of accident; collisions of trains, collisions with obstacles, derailments, accidents involving people and moving railroad vehicles, fires in railroad vehicles, hazardous substances and other] (Item 3.1 should be supplemented with trends established in accident investigations.)

Accidents investigated		2017	2018	2019	2020	2021	Total
Serious accidents	Collision						
	Derailment			1			1
Article 20(1) of the Directive on Railway Safety	Level crossing						
	People and moving railway vehicles						
	Fires in railway vehicles						
	Other						
	Hazardous						
Other accidents	Collision	1	1				2
	Derailment	3	2	4		1	10
Article 20(2) of the Directive on Railway Safety	Level crossing	3	1	4	4	1	13
	People and moving railway vehicles		1	1		2	4
	Fires in railway vehicles						
	Other	1	3		1		5
	Hazardous						
TOTAL		8	8	10	5	4	35

Investigated events – serious accidents, accidents or incidents by number: seven in 2017, eight in 2018, 10 in 2019, five in 2020 and four in 2021.

One investigated accident in 2021 occurred on a regulated level crossing with traffic signs, one during movement on station tracks, one on a passenger stop and one during movement on an open line when the train hit a person crossing the tracks. One accident involved only railway vehicles, one a road passenger road motor vehicle, one a minor girl and one an elderly pedestrian with a dog on a leash. The accidents resulted in the deaths of a minor girl and an elderly man and the serious injury of a female driver of a passenger road motor vehicle.

As individual accidents were rare occurrences, there is no need to conduct more detailed studies on railway safety in the 2017–2021 period.

## 4 RECOMMENDATIONS

A table showing the implementation of recommendations in the last 10-year period.

Recommendations issued		Implementing stage of recommendations					
		Implemented		Are being implemented (or are being drafted)		Will not be implemented (rejected)	
YEAR	No.	No.	%	No.	%	No.	%
2012	12	10	83.3			2	16.7
2013	5	4	80			1	20
2014	8	5	62.5			3	37.5
2015	4	4	100				
2016	5	3	60			2	40
2017	16	13	81.3	3	18.77		
2018	17	15		2			
2019	18	14	77.78	4	22.22		
2020	9	8	91.7	1	8.3		
2021	12	8	66.7	4	33.3		
<b>TOTAL</b>	<b>106</b>	<b>84</b>	<b>79.2</b>	<b>14</b>	<b>13.2</b>	<b>8</b>	<b>7.6</b>

In 2021, the investigating body for rail transport issued 12 recommendations concerning:

- the removal of vegetation from the trackside area in the immediate vicinity of a level crossing to ensure the visibility of the tracks in and from the direction of the level crossing;
- monitoring vegetation growth in the visibility triangle of the level crossing during periods of high growth;

- further securing of the platform of a passenger stop by building a high barrier directing persons to use the underpass;
- putting up additional warning signs warning of the danger of crossing and walking in the danger zone of the tracks;
- drafting a risk plan for shunting on station tracks;
- upgrading the video system by setting up additional cameras enabling the monitoring of shunting;
- moving the camera closer to the switch area;
- prescribing protocols for shunting notifications for the PSCTs;
- drafting a risk management plan for shunting locomotive manipulations;
- the training of PSCTs, with an emphasis on the risks involved in shunting manipulations;
- studying the possibility of building a noise barrier which, among other things, will prevent tracks from being crossed;
- ensuring a safe path to a culvert under tracks.



Investigator in Charge of  
Railway Accidents and  
Incidents:  
Daniel Lenart, Secretary