REPUBLIKA SLOVENIJA
MINISTRSTVO ZA INFRASTRUKTURO

AIR, MARITIME AND RAILWAY ACCIDENT AND INCIDENT INVESTIGATION UNIT

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ANNUAL REPORT OF THE INVESTIGATION BODY FOR RAIL TRANSPORT OF THE REPUBLIC OF SLOVENIA

2020

Ljubljana, 24/09/2021

INTRODUCTION

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

Since 15 June 2018, the investigation body has operated in accordance with Directive (EU) 2016/798 of the European Parliament and of the Council of 11 May 2016 on railway safety, which was transposed into the legal order of the Republic of Slovenia with the provisions of the Railway Traffic Safety Act published in the Official Gazette of the Republic of Slovenia [*Uradni list RS*], No. 30/2018 of 26 April 2018.

The annual report on safety investigations in rail transport in the Republic of Slovenia for 2020 includes a presentation of the body's organisation, legal bases for its actions, an overview of accidents and incidents investigated, and recommendations issued and accepted in 2019.

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1 PRESENTATION OF SAFETY INVESTIGATION ORGANISATION

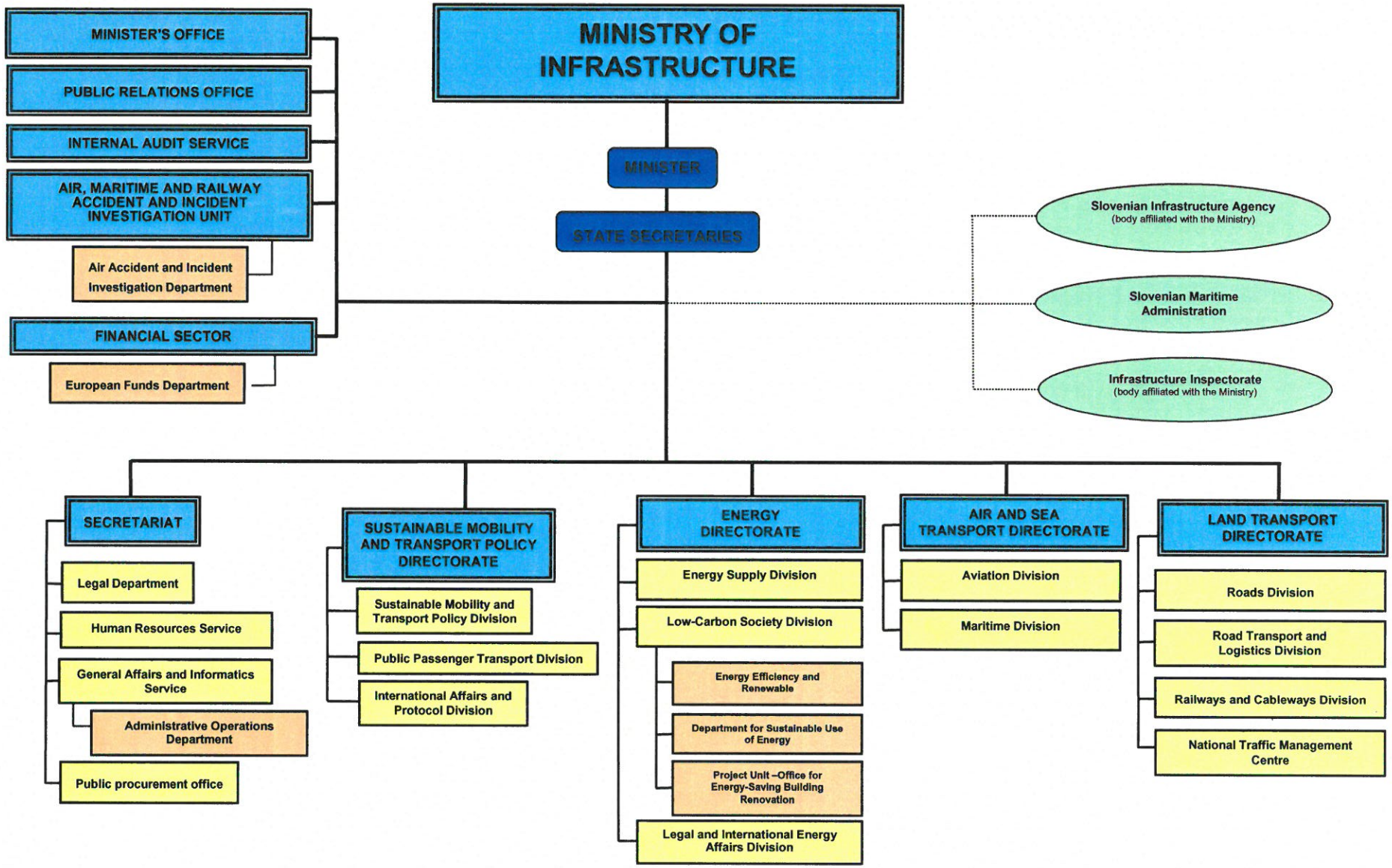
Since its establishment in 2008, the investigation body has operated as an independent organisational unit as the Railway Accident and Incident Investigation Service.

On 22 February 2017, an organisational unit was formed at the Ministry of Infrastructure in which the investigative bodies for air, maritime and railway accidents and incidents were merged. The Air, Maritime and Railway Accident and Incident Investigation Unit of the Ministry of Infrastructure is directly subordinate to the leadership of the Ministry.

The investigation body for railway accidents and incidents of the Air, Maritime and Railway Accident and Incident Investigation Unit employs only one person, who in addition to investigation, performs all other tasks subject to cooperation in the network of EU investigation bodies, which operates under the auspices of the European Union Agency for Railways (ERA).

The investigation body in rail transport is organisationally independent from the national safety and regulatory authority in rail transport. The financial resources for its operation are earmarked in the budget.

The head office of the Air, Maritime and Railway Accident and Incident Investigation Unit is situated at the Ministry of Infrastructure, Langusova ulica 4, Ljubljana.


MINISTRY OF INFRASTRUCTURE
MINISTER
STATE SECRETARIES
MINISTER'S OFFICE
PUBLIC RELATIONS OFFICE
INTERNAL AUDIT SERVICE
AIR, MARITIME AND RAILWAY ACCIDENT AND INCIDENT INVESTIGATION UNIT
Air Accident and Incident Investigation Department
FINANCIAL SECTOR
European Funds Department
Slovenian Infrastructure Agency (body affiliated with the Ministry)
Slovenian Maritime Administration
Infrastructure Inspectorate (body affiliated with the Ministry)
SECRETARIAT
Legal Department
Human Resources Service
General Affairs and Informatics Service
Administrative Operations Department
Public procurement office
SUSTAINABLE MOBILITY AND TRANSPORT POLICY DIRECTORATE
Sustainable Mobility and Transport Policy Division
Public Passenger Transport Division
International Affairs and Protocol Division
ENERGY DIRECTORATE
Energy Supply Division
Low-Carbon Society Division
Energy Efficiency and Renewable
Department for Sustainable Use of Energy
Project Unit –Office for Energy-Saving Building Renovation
Legal and International Energy Affairs Division
AIR AND SEA TRANSPORT DIRECTORATE
Aviation Division
Maritime Division
LAND TRANSPORT DIRECTORATE
Roads Division
Road Transport and Logistics Division
Railways and Cableways Division
National Traffic Management Centre

1.1. Legal basis (or legal framework)

The legal basis for the operations of the investigation body in rail transport is stipulated by the provisions of Article 19 of the Railway Traffic Safety Act (ZZelP-1; Official Gazette of the Republic of Slovenia [*Uradni list RS*], No. 30/2018 of 26 April 2018).

The investigation body in rail transport is organisationally, financially and legally independent from the public railway infrastructure manager, railway carriers, the charging body, the allocation body and the notified body.

The investigation body is also functionally independent of the safety and regulatory authority.

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

The Chief Investigator of railway accidents and incidents at the ministry of the Republic of Slovenia responsible for transport is contractually appointed on a permanent basis and conducts safety investigations of serious accidents, other accidents and incidents.

Investigations of serious accidents, other accidents and incidents in rail transport are conducted to improve safety in rail transport. The Chief Investigator of railway accidents and incidents at the ministry of the Republic of Slovenia responsible for transport cooperates with the investigation bodies of other railways within the EU and in the network of national investigation bodies that operates under the auspices of the European Railway Agency (ERA).

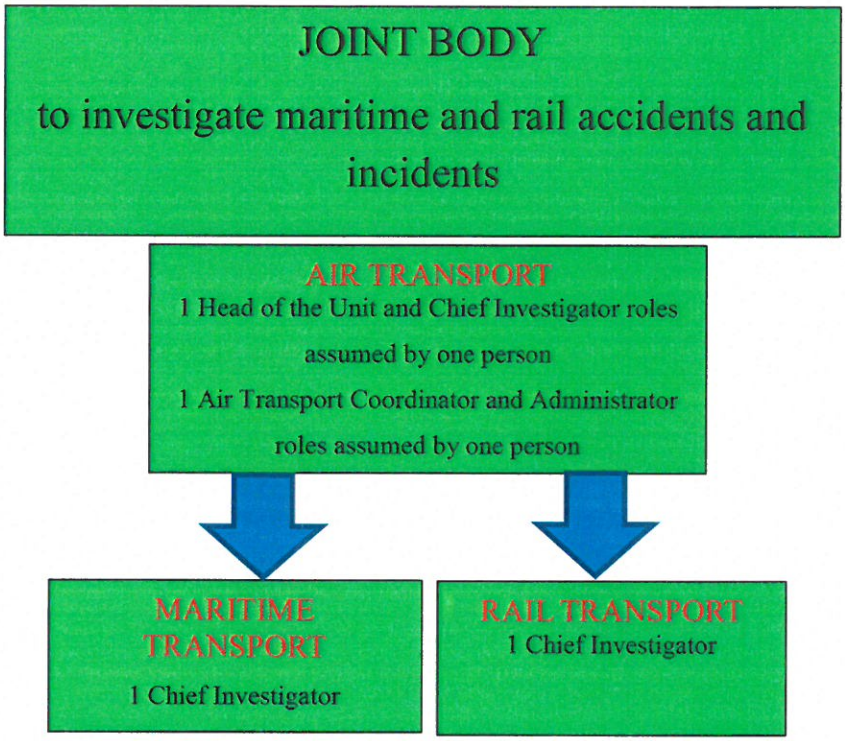
1.3. Internal organisation and subdivisions

The Air, Maritime and Railway Accident and Incident Investigation Unit is organisationally part of the Ministry of Infrastructure, which is responsible for transport. A new Air Accident and Incident Investigation Department was formed at the Air, Maritime and Railway Accident and Incident Investigation Unit in 2020.

According to the internal staffing structure of the ministry, the

Air, Maritime and Railway Accident and Incident Investigation Unit has one member of staff, i.e. the Chief Investigator of railway accidents. When investigating accidents and incidents, the Chief Investigator of railway accidents and incidents does not manage the funds earmarked in the budget for investigation of railway accidents and incidents. These funds are managed by the budget item custodian.

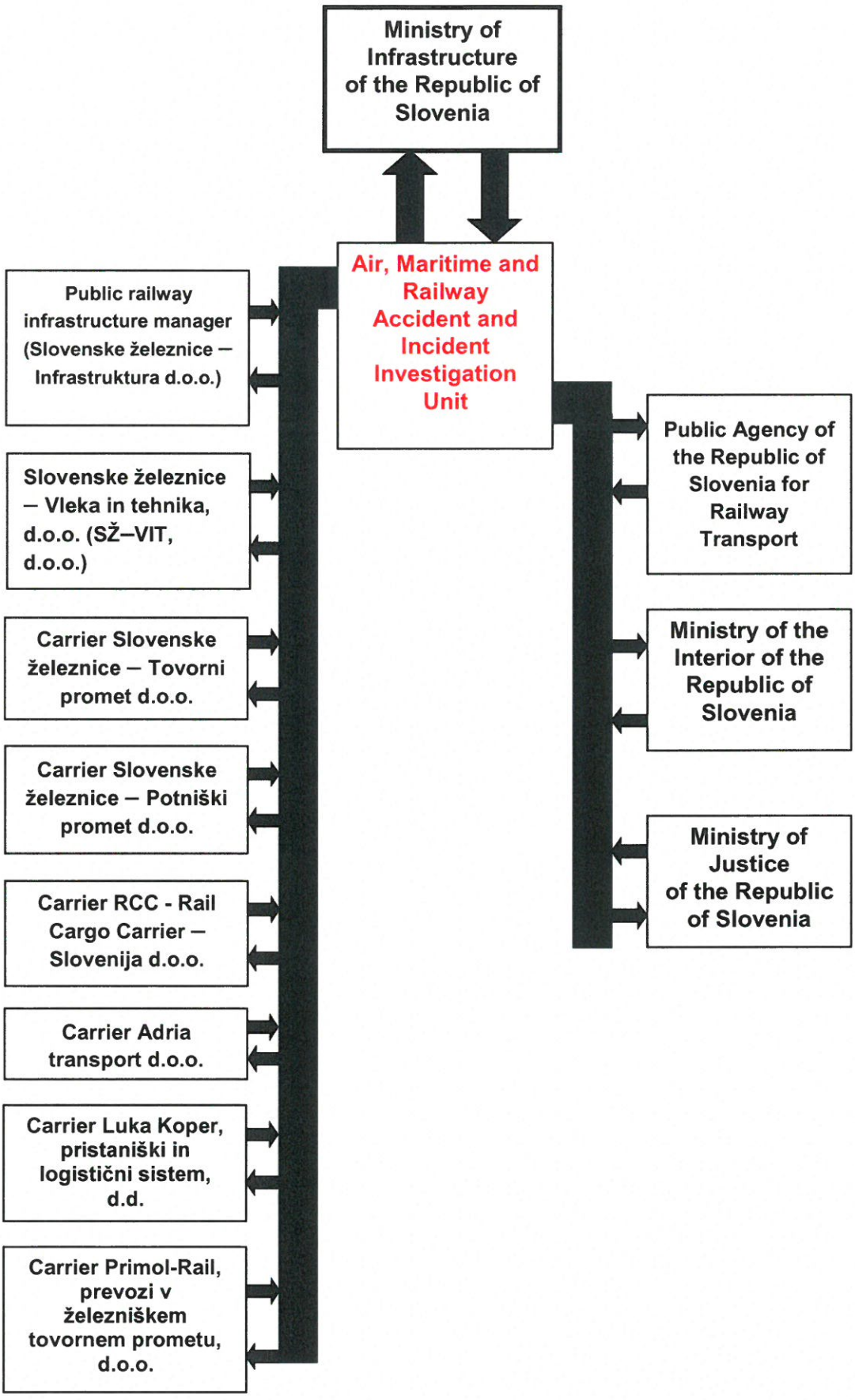
The Chief Investigator is qualified to carry out all the functions required in an investigation procedure in the event of an accident or an incident.



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

The Air, Maritime and Railway Accident and Incident Investigation Unit at the ministry of the Republic of Slovenia responsible for transport conducts safety investigations of accidents and incidents separately by individual transport branches and operates completely independently.

The body responsible for investigations in rail transport cooperates with other national investigation bodies and judicial authorities, the railway safety authority, the public railway infrastructure manager, and all licensed railway carriers in the Republic of Slovenia.


Ministry of Infrastructure of the Republic of Slovenia
Air, Maritime and Railway Accident and Incident Investigation Unit
Public railway infrastructure manager (Slovenske železnice – Infrastruktura d.o.o.)
Slovenske železnice – Vleka in tehnika, d.o.o. (SŽ–VIT, d.o.o.)
Carrier Slovenske železnice – Tovorni promet d.o.o.
Carrier Slovenske železnice – Potniški promet d.o.o.
Carrier RCC - Rail Cargo Carrier – Slovenija d.o.o.
Carrier Adria transport d.o.o.
Carrier Luka Koper, pristaniški in logistični sistem, d.d.
Carrier Primol-Rail, prevozi v železniškem tovornem prometu, d.o.o.
Public Agency of the Republic of Slovenia for Railway Transport
Ministry of the Interior of the Republic of Slovenia
Ministry of Justice of the Republic of Slovenia

If necessary, the investigation body also cooperates with all national investigation bodies of EU Member States that operate within the network of national investigation bodies under the auspices of the European Railway Agency (ERA).

It acquires all information required to conduct investigation procedures from the aforementioned entities. As railway accident investigations are conducted as transparently as possible, all parties involved and other interested parties are given the opportunity to be informed of and to share the investigation results.

The ministry of the Republic of Slovenia responsible for transport ensures that the Air, Maritime and Railway Accident and Incident Investigation Unit has functional independence and receives funding from the budget. The ministry in no way interferes with the autonomy of the investigation body.

Pursuant to the provisions of paragraph 12 of Article 9 of the Rules on emergency plans for serious accidents, other accidents and incidents in rail transport (Official Gazette of the Republic of Slovenia [*Uradni list RS*], No. 50/2019 of 09/08/2019), the public railway infrastructure manager and railway carriers are obliged to promptly notify the investigation body of any serious accidents, other accidents and incidents in rail transport.

The investigation body is notified by phone and subsequently in writing using the prescribed form ID-1.

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

The provisions of Article 21 of the Railway Traffic Safety Act (ZZelP-1; Official Gazette of the Republic of Slovenia [*Uradni list RS*], No. 30/2018 of 26 April 2018), stipulate that the competent authorities, railway carriers, the public railway infrastructure manager and other entities involved must enable the investigation body to carry out its tasks efficiently, swiftly

and independently. Past practice shows that the prescribed provisions are consistently observed.

Article 20 of the Railway Traffic Safety Act (ZZelP-1; Official Gazette of the Republic of Slovenia [*Uradni list RS*], No. 30/2018 of 26 April 2018) stipulates that the investigation body must investigate all serious accidents.

The investigation body may, at its discretion, also decide to investigate accidents and incidents that could cause serious accidents in similar circumstances, including cases of technical errors in structural subsystems or interoperability components of the railway system.

The investigation body takes into account all the provisions of the aforementioned act.

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

Outside of its regular working hours, the body investigating railway accidents and incidents must be constantly on standby.

In order to prove their identity, the Chief Investigator carries an identity card presenting the relevant authorisations. The form of the identity card is prescribed by the competent minister of transport.

The mobility of the Chief Investigator is ensured by an official vehicle of the Air, Maritime and Railway Accident and Incident Investigation Unit or a car of the Ministry of Infrastructure. If a car is not available, mobility is ensured by the personal vehicle of the Chief Investigator.

The aforementioned arrangements for readiness and mobility ensure a prompt response in regard to investigating the scene of an event and the initiation of the investigation procedure.

It takes the Chief Investigator up to two hours by personal vehicle to reach the most distant location of the Slovenian railway network via the available traffic routes from their place of residence or workplace, which in this case are located in central Slovenia.

2 INVESTIGATION PROCEDURE

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

The investigation body investigates serious accidents, other accidents and incidents in rail transport. As per the provisions of the Railway Traffic Safety Act (ZZelP-1; Official Gazette of the Republic of Slovenia [*Uradni list RS*], No. 30/2018 of 26 April 2018), the investigation body must examine all serious accidents, and it also has the discretionary right to decide whether it will also investigate accidents and incidents that could cause serious accidents in similar circumstances, including cases of technical errors in structural subsystems or interoperability components of the railway system.

Pursuant to the Railway Traffic Safety Act (ZZelP-1; Official Gazette of the Republic of Slovenia [*Uradni list RS*], No. 30/2018 of 26 April 2018), a serious accident is any collision or derailment of trains that results in the death of one or more people or serious injuries to five or more people or significant damage to rolling stock and infrastructure or major pollution of the environment, and any other similar accident with an obvious impact on railway safety or safety management. Significant damage is material damage that may be promptly assessed by the Chief Investigator of railway accidents and amounts to no less than EUR 2 million.

The investigation body for rail transport in the Republic of Slovenia takes into account the aforementioned provisions and investigates all serious accidents and other accidents and incidents that could cause serious accidents in similar circumstances. Accidents and incidents are investigated at its own discretion.

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

During the investigation, the Chief Investigator of railway accidents of the ministry of the Republic of Slovenia responsible for transport cooperates with the law enforcement authority and with minor offence and judicial authorities. The findings of the Ministry of the Interior and judicial authorities are regularly included in the final reports.

If an investigation procedure requires an analysis of chemical substances and other material, the investigation body engages competent independent licensed organisations with laboratories, such as the Jožef Stefan Institute, Institute for Research in Materials and Applications, Institute of Metal Constructions, etc.

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

If recordings from devices that record verbal messages are reproduced, expert workers of the railway infrastructure manager who controls such devices are included in an investigation. The expert workers of the infrastructure manager are also involved in analysing the databases of signalling and safety devices. The expert workers of railway carriers are engaged if databases of train operating records are to be analysed.

2.3 Investigation procedure or the approach of the investigation body (the same as 1.5, although in more detail)

Article 21 of the Railway Traffic Safety Act (ZZelP-1; Official Gazette of the Republic of Slovenia [*Uradni list RS*], No. 30/2018 of 26 April 2018) stipulates that the competent authorities, carriers, the railway infrastructure manager and other entities involved must enable the investigation body to carry out its tasks efficiently, swiftly and independently, a stipulation which has been observed by all of the above.

Article 21 of the Railway Traffic Safety Act (ZZelP-1; Official Gazette of the Republic of Slovenia [*Uradni list RS*], No. 30/2018 of 26 April 2018) determines the responsibilities toward the investigation body of the competent authority, carriers, the railway infrastructure manager and other entities involved. They must ensure:

a) free access to the scene of an accident, serious accident or incident, as well as to any rolling stock, infrastructure facilities and facilities and devices for traffic and signalisation management involved;

b) prompt recording of evidence and supervised removal of wreckage, infrastructure facilities and devices or their constituents for examination and analysis;

c) access and the use of recordings from devices that record verbal massages on the train and a record of the operation of the signalisation and traffic management system;

d) access to the results of victim post-mortem reports;

e) access to the results of examinations of train staff and other people involved in the accident;

f) the questioning of railway workers involved and other witnesses;

g) access to all suitable information or records of the manager, carriers involved and the safety authority.

Article 20 of the Railway Traffic Safety Act (ZZelP-1; Official Gazette of the Republic of Slovenia [*Uradni list RS*], No. 30/2018 of 26 April 2018) stipulates that the investigation body must investigate all serious accidents.

After careful consideration, the investigation body may also decide to investigate accidents and incidents that could lead to serious accidents in similar circumstances, including cases of technical errors in structural subsystems or interoperability components of the railway system. In its decision, it takes into account the following:

a) the seriousness of the accident or incident;

b) whether the accident or incident is related to a set of accidents or incidents concerning the entire system;

c) the impact on rail transport safety at the level of the European Union, and

d) requests from infrastructure managers, railway carriers, the national safety authority or the Member States.

The investigation body in rail transport takes into account all the prescribed provisions referring to investigation procedures. However, it is limited by a shortage of staff, and thus has to make additional decisions on investigating the accidents and incidents that it wishes to investigate.

3 INVESTIGATIONS

3.1 Overview of investigations completed in 2020

In 2020, the Railway accident and incident investigation body investigated four accidents and one incident:

- collision of local passenger train No. 3212 at a regulated level crossing marked with road signs, at km 143.033, between the stations Ljubljana Rakovnik and Škofljica, with a road cargo motor vehicle, on 24 September 2019 at 12:19 p.m.;
- collision of local passenger train No. 2408 with a cyclist who wanted to cross a single-track railway line at a level crossing for pedestrians NPr 567.8, between the stations Ljubljana Šiška and Ljubljana Vižmarje, at km 567.774, on 10 November 2019 at 12:53 p.m.;
- collision of train No. 9620, an empty passenger unit, at a regulated level crossing of the Rodica station marked with road signs, with a pedestrian between the stations Domžale and Jarše Mengeš, at km 14+117, on 10 January 2020, at 9:25 a.m.;
- collision of goods train no. 56490 with a road motor vehicle at a regulated level crossing marked with road signs, between the stations Ljutomer and the unoccupied loading bay Gornja Radgona, at km 5.193, on 22 March 2020 at 10:05 a.m.;
- left wheel fracture, first axle, second bogie, 17th wagon, No. 31 81 537 5060-5, of goods train No. 53202, between the stations Pivka and Gornje Ležeče, on 31 March 2020 between 2.55 a.m. and 3:09 a.m..

Type of investigated events	Number of events	Number of victims		Damage in EUR (estimated)	Trend in comparison with 2019
		Fatalities	Severely injured		
Trčenje vlakov	0	0	0	0 €	0 = 0
Iztirjenje vlaka	0	0	0	0 €	0 < 2
Trčenje - premik	0	0	0	0 €	0 = 0
Drugo	5	2	2	145.400,00 €	5 = 5

3.2 Investigations conducted and completed in 2020

In 2020, of the investigations into five accidents and one incident that were initiated, two investigations into accidents and one investigation of an

incident were concluded. The investigation procedures for investigations of collisions of shunters and two collisions with road motor vehicles were concluded and are in the final report issuance phase. All reports of the above-mentioned investigations will be issued by the end of 2021.

All instigated accident and incident investigations were instigated by the railway accident and incident investigation body on the basis of Article 20(2) of Directive 2016/798 of the European Parliament and of the Council, OJ L 138, 26 May 2016.

Investigations completed in 2020				
Date of accident or incident	Type of accident or incident	Place of accident or incident	Legal basis	Date of completion
24 September 2019	collision of passenger train No. 3281 with a road cargo motor vehicle	between the stations Ljubljana Rakovnik and Škofljica, NPr at km 146.457	Article 20 of the Railway Transport Act (ZZelP)	30 November 2020
10 November 2019	collision of passenger train No. 2408 with a cyclist	between the stations Ljubljana Šiška and Ljubljana Vižmarje, NPr at km 567.774	Article 20 of the Railway Transport Act (ZZelP)	5 November 2020
26 November 2018	collision of passenger train No. 9620 (empty passenger unit) with a pedestrian	between the stations Domžale and Jarše Mengeš, NPr at km 14.100	Article 20 of the Railway Transport Act (ZZelP)	9 February 2021
2 March 2020	collision of passenger train No. 65490 with a road cargo motor vehicle	between the stations Ljutomer and the unoccupied loading bay Gornja Radgona, NPr at km 5.193	Article 20 of the Railway Transport Act (ZZelP)	1 March 2021
31 March 2020	Wheel fracture on goods train No. 53202	between the stations Pivka and Gornje Ležeče, allegedly at km 655.150	Article 20 of the Railway Transport Act (ZZelP)	28 May 2021

3.3 Research studies (or safety studies in cases of serious accidents) that were ordered and completed in 2019

No serious accident took place on the railway network of the Republic of Slovenia in 2020, while there were five accidents and one incident. In the five accidents, one person died from injuries, one person sustained serious injuries and two persons sustained light injuries.

An incident occurred in 2020 on goods train No. 53202 when a wheel on the 17th wagon fractured, which is a situation that can lead to a serious accident in similar circumstances. A part of the wheel fell off as it fractured. The brake rigging became stuck in the edge of the fractured wheel, causing the brake triangle to warp and be pushed under the floor of the wagon, which caused a blockage of the first axle of the second bogie. Due to the blocked axle, the wheels on the axle slid on the tracks for approximately 15,400 m, measured from the point where the left wheel became stuck and the point where the train stopped at the Divača station.

3.4 Summaries of investigations completed in 2020 Brief descriptions, photographs and diagrams, and safety studies

Collision of passenger train No: 2408 with a cyclist at a level crossing for pedestrians, NPr 537.8, between the stations Ljubljana Šiška and Ljubljana Vižmarje, at km 567.774, on 10 November 2019

Local passenger train No. 2408 was travelling on the Ljubljana - Jesenice route on 10 November 2019. The train was scheduled to make stops at all stations and stops between the starting and final stations (Ljubljana-Jesenice).
Local passenger train No. 2408 was travelling on the main single-track electrified railway line No. 20, Corridor X, international code of the railway line E-65, from the starting station Ljubljana to the final shunting yard Jesenice.
Train No. 2408 left the Ljubljana station at 12:50:27, and at 12:53 a.m. it collided with a cyclist who wanted to cross the single-track railway line at a level crossing for pedestrians between the stations Ljubljana Vižmarje and Ljubljana

Šiška. The cyclist, who was travelling on the road that runs parallel to the railway line, turned towards the level crossing just as the train was approaching. When the cyclist was located in the middle of the track, he was struck by the train with the EMU pilot.

The cyclist was travelling on Ob kamniški progi Road from the direction of Janševa ulica Street in the direction of Magistrova ulica Street. At the passenger level crossing NPr 567.8, the cyclist turned towards Drenikova ulica Street. Local passenger train No. 2408 was travelling from the direction of Ljubljana Šiška station in the direction of the next station, Ljubljana Vižmarje.

The pedestrian level crossing NPr 567.8, at km 567.774 between the stations Ljubljana Šiška and Ljubljana Vižmarje is secured by an automatic device of the system Iskra NPr DK – PO, which is remote controlled at the Ljubljana Šiška station. The operation of the security device at NPr 567.8 is controlled by the train controller of the Ljubljana Šiška station on the basis of indicators in the mosaic mimic panel of the electro-relay signalling safety devices of the station.

The light traffic sign that marks the crossing of the road with the railway line at level crossing NPr 567.8 is switched on by the train travelling from the direction of Ljubljana towards Jesenice. It is switched on by the train running over insulated rail joints of switch No. 15, at km 567+347, under the condition that theexit path for the travel of the train at the Ljubljana Šiška station is established and secured. The lights on the light signal sign blink as they announce the approach by a track vehicle. In addition to the traffic signs, the level crossing of the road and railway line is also secured with sound signals.

During the travel of train No. 2408, the safety device at the level crossing NPr 567.8 functioned flawlessly, the light signals blinked, and the sound signal bell device also functioned flawlessly.

The engine driver of passenger train No. 2408 could not have avoided striking the cyclist at level crossing NPr 567.8, at km 567.774. The cyclist was on the railway line at the moment when the EMU pilot was 23 m ahead of the level crossing. Train No. 2408 stopped 177 metres from the point of collision with the cyclist. The railway line was closed between 12:53 a.m. and 4 p.m.

Picture No. 1: direction of travel of the local train is marked by a blue arrow, direction of travel of the cyclist by a red arrow, and location of the collision by a black cross

Causes:

The direct cause of the collision of local passenger train No. 2408, on 10 November 2019, at 12:53 a.m., with the cyclist is the lack of attention paid by the latter, who failed to acknowledge the blinking light signals on the traffic sign which, in addition to the ringing of the safety device, warn road traffic participants about incoming trains, and who failed to stop before the level crossing, and instead cycled onto the railway line at the moment when the train was approaching from his left side.

An indirect cause for the collision of the train with the cyclist was the earphones that the cyclist wore while riding the bicycle. An indirect cause can also be attributed to the abundant vegetation along the railway track, which absorbs the noise generated by track vehicles during travel exceptionally well. Electric EMUs generate very little noise by default due to their technical characteristics.

Consequences:

The consequence of the collision of local passenger train with the cyclist at the level crossing NPr 567.8, between the stations Ljubljana Šiška and Ljubljana Vižmarje, which is secured with traffic signs and blinking lights that announce

incoming trains to road traffic participants, was the death of the cyclist, a 15-year-old boy, who succumbed to his injuries on the spot, and minor material damage - damage to the front side of EMU 312-138 and a destroyed bicycle.

Recommendations:

After a similar accident, when goods train No. 53441 collided with a cyclist on 15 May 2018 with the pilot of the locomotive No. 643-026 at the level crossing NPr 567.8, two recommendations were issued in order to avoid similar accidents in the future:

1. as part of the system of safe management of railway traffic, the public railway infrastructure manager should, together with the Ljubljana City Municipality, upgrade the security of the level crossing with additional semi-barriers that would physically prevent the crossing of passengers and narrow single-track vehicles (bicycle, mopeds);
2. the public railway infrastructure manager, Slovenske železnice, d.o.o., should, together with the Ljubljana City Municipality, start to comprehensively regulate the security of the wider area at and around level crossing NPr 567.8 with the use of technical barriers (appropriate railing) that would prevent the crossing of the railway line.

The level crossing is located in an urban - settled area of the city of Ljubljana, near a sport park, which is why there are many unlawful crossings in the immediate vicinity of the level crossing, through vegetation – hedges.
Recommendation No. 1 has been accepted and realised after the collision of local passenger train No. 2408 with a cyclist on 10 November 2020.
Recommendation No. 2 has not yet been realised.

Collision of local passenger train no. 3212 with a goods road motor vehicle at an unsecured level crossing between the stations Škofljica ad Ljubljana Rakovnik, at km 143.033 on 24 September 2019, at 12:19 a.m.

On 24 September 2019 12:19 p.m., local passenger train No. 3212 collided with a goods road motor vehicle at a regulated level crossing marked with road signs, at km 143.033, between the stations Ljubljana Rakovnik and Škofljica. Passenger train No. 3212 travelled from the starting station of Metlika on a single-track, non-electrified line No. 80 (Metlika – Ljubljana). The goods road

motor vehicle approached the level crossing while driving in the right lane from the direction of the Dolenjska cesta Road on the local Pod Strahom Road.
At the moment when the train was approaching the level crossing, the goods road motor vehicle entered the hazardous area of the level crossing. The engine driver of the local passenger train could not have prevented the collision because the train was so close to the crossing when the driver of the goods road motor vehicle entered the hazardous area of the crossing that he was not able to take preventive action.

Picture No. 1: A red arrow shows the direction of travel of the goods road motor vehicle from the direction of the Dolenjska cesta Road on the local Pod Strahom Road, a blue arrow shows the direction of travel passenger train no. 3212 which was travelling from Metlika to Ljubljana, and a black cross marks the site of collision.

From the moment when the emergency brake was applied until the stopping of the train, train No. 3212 travelled approximately 280 m. The train hit the rear left wheel of the cargo part of the goods road motor vehicle, type Volvo 280 Euro 5, with an automatic coupler and left corner of the pilot of EMU 715-122 in the direction of travel of the train.
Based on the position of the goods road motor vehicle after the collision and the tyre track traces of the goods road motor vehicle left on the paved road as the train pushed it, it is possible to establish with certainty that the goods road motor vehicle entered the hazardous area of the railway line at the moment when the train was approaching.
Train No. 3212 collided with the goods road motor vehicle at a speed of 64 km/h.

After the collision, the front of the train stopped at km 143.258,6. From the point of collision with the goods road motor vehicle to the point of stoppage, the train travelled 225.6 m.

Causes:

The direct cause of the collision of local passenger train No. 3212 with the goods road motor vehicle that drove onto the crossing of the local road and single-track railway line at the moment when the train was approaching the level crossing is insufficient visibility of the railway line from the road in the direction of the Škofljica station due to vegetation that grows on the right side of the railway line and blocks the view.

On the right side of the railway line, goods road motor vehicles are parked 200 m before the level crossing at a parking lot of the Pečjak bakery, reaching into the railway line strip, which reduces visibility already at that distance. This is an indirect cause of the accident.

The driver of the goods road motor vehicle of total length of 9350 mm did not manage to move away from the area of the level crossing in time while crossing the railway line with the vehicle.

Consequences:

The consequences of the collision of local passenger train No. 3212 at the regulated level crossing with a road, marked with road signs, between the stations Ljubljana Rakovnik and Škofljica, on 24 September 2019, at 12:19 a.m. were:

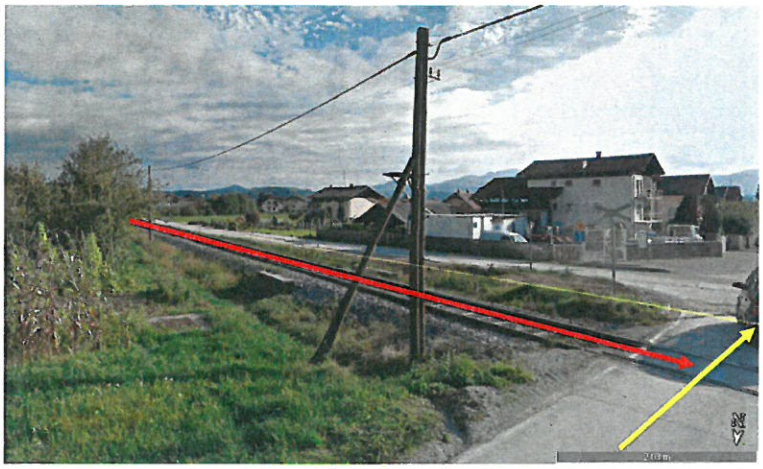
- light injuries to the driver of the goods road motor vehicle;
- damaged pilot of control unit DMG 715-122;
- damaged suspension of the first bogie in the direction of travel of the train;
- damaged automatic coupler on the control unit DMG 715-122 and
- damaged goods road motor vehicle.

Recommendations:

To avoid similar accidents in the future, the following recommendations are issued to:

1. the road infrastructure manager, the Municipality of Škofljica:
   - to ban traffic of motor vehicles longer than 4 m at the level crossing 143.033 until an arrangement is made with Pečjak d.o.o. that the company parks goods road motor vehicles outside the railway line strip;
2. to the railway infrastructure manager, SŽ – Infrastruktura, d.o.o.:

- removal of trees and tall shrubbery in the railway line strip between the house at the address Dolenjska cesta 432 and the railway line.



Picture No. 2: A red arrow shows the direction of travel of train No. 3212 and a yellow arrow the direction of travel of the goods road motor vehicle.

An analysis of road traffic at the level crossing and the existing road and railway infrastructure showed that the trees and tall shrubbery in the immediate vicinity of the level crossing pose a very high risk for road traffic participants who cross the railway line. Goods road motor vehicles longer than 4 m are especially exposed to the risk.

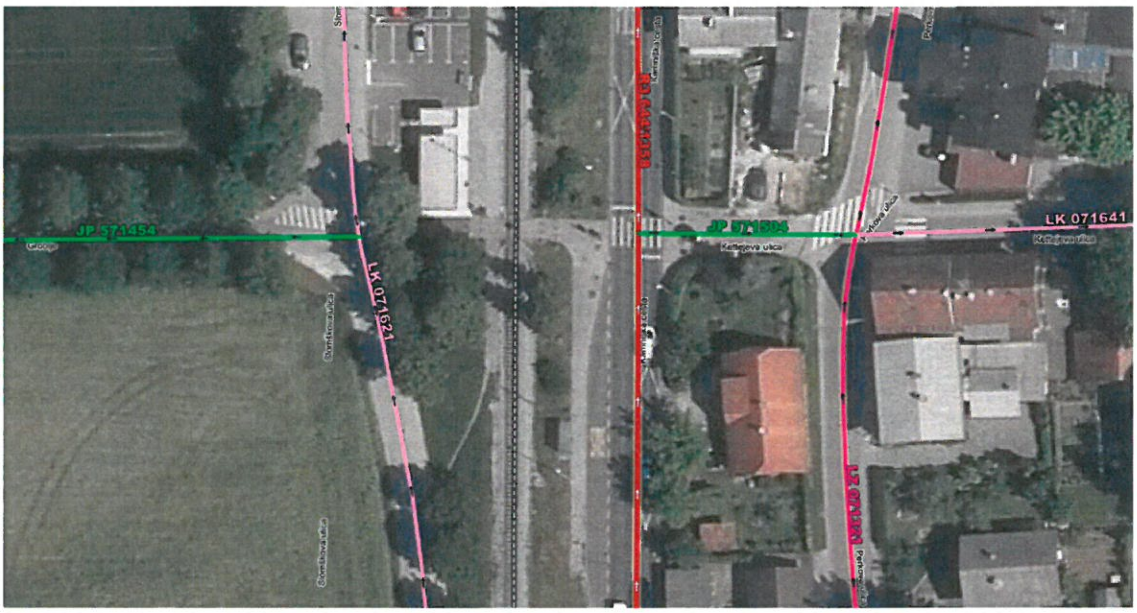
Collision of local passenger train No. 9620 (empty passenger unit), at a regulated level crossing for pedestrians at the Rodica station, marked with road signs, with a pedestrian between the stations Domžale and Jarše Mengeš, at km 14+117, on 10 January 2020, at 9:25 a.m.

On 10 January 2020, at 9:25 a.m., passenger train No. 9620 collided with a pedestrian, a young girl, at a regulated level crossing of the Rodica station marked with road signs, between the stations Domžale and Jarše Mengeš, at km 14+117.

The girl sustained serious injuries in the collision. She was taken by an ambulance for treatment at the UKC Ljubljana hospital.

The accident took place on the single-track non-electrified regional railway line Ljubljana Šiška - Kamnik Graben No. 21. A two-lane regional road, the Kamniška cesta Road (R3 644, road section 1358), runs parallel to the railway line, which at the point of collision is 13 metres away from the right track.

The passenger train – empty passenger unit, no. 9620, was travelling in accordance with the elements of the schedule of train No. 38202, on the route Ljubljana – Jarše Mengeš. There are no scheduled stops at official spots in the elements of the schedule of train No. 38202 throughout the entire route. The last stop of the train before the accident was at Domžale station. After stopping at Domžale station, the train continued to travel towards Jarše Mengeš station.



Picture No. 1: Traffic infrastructure in the area of the accident (green line - the Kettejeva ulica Street, black-white line - railway line, red line - the Kamniška cesta Road, violet line - local roads)

Before the accident, the train had stopped at Domžale station, and then continued travelling towards Jarše Mengeš station.

The point of the collision is at an altitude of 307m.

The girl was walking on Kettejeva ulica Street (public path No. 571504) in the direction of the Biotechnical Faculty, Groblje 3. She crossed the Kamniška cesta Road at a pedestrian crossing. The Kettejeva ulica Street runs perpendicular to the railway line. Two types of metal bollards are installed on the public path directly before the railway line to prevent the driving of cars and all-terrain vehicles across the level crossing.

Picture No. 2: a grey cross marks the spot of collision, a red arrow marks the direction of travel of the train, and a blue arrow marks the direction in which the pedestrian was walking

The pedestrian did not stop before the railway line despite the incoming train. The train was approaching from her left side. The pedestrian entered the hazardous area of the railway line directly in front of the pilot of the diesel engine. The train hit the girl with the right corner of the control unit 715-120, diesel engine 713-120. After the collision, the victim was left lying along the railway line on the right side, 3.80 m from the right track and 11.5 m from the point of collision in the direction of travel of the train.

Train No. 9620 was part of the diesel motor unit DMG 713/715-120, with a total weight of 60 tonnes, a length of 47 m and 8 axles.

Causes:

The direct cause for the collision of the passenger train – empty passenger unit, No. 9620, on 10 February 2020 at 09:25 a.m., at the regulated level crossing for pedestrians of the Rodica station, marked with road signs, between the stations Domžale and Jarše Mengeš, at km 14.117, is the lack of attention paid by the 20-year-old girl, who did not make sure whether a track vehicle was approaching the level crossing before entering the hazardous area of the railway line at the crossing.

An indirect cause for the collision can be attributed to the pedestrian focusing

on the distracting elements of road traffic that runs on the roads parallel to the railway line, in the immediate vicinity of the level crossing, which are highly concentrated in this area.

Consequences:

The consequences of the collision of local passenger train No. 9620 - empty passenger unit, at a regulated level crossing for pedestrians at the Rodica station, marked with road signs, with a pedestrian between the stations Domžale and Jarše Mengeš, on 10 February 2020, at 9:25 a.m. are:

- serious injuries to the pedestrian, a 20-year-old resident;
- minor damage – an indentation on the right side of the pilot of the control unit 715-120, DMG 713/715-120.

Recommendation:

The following measures are recommended to be taken in order to prevent similar accidents in the future.

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

It is recommended that all vegetation on both sides of the railway line from the direction of Rodica station in the direction of Domžale station that blocks the view of the railway line for road traffic participants is removed within the railway line strip.

Collision of goods train no. 56490 with a road motor vehicle at a regulated level crossing marked with road signs, between the stations Ljutomer and the unoccupied loading bay Gornja Radgona, at km 5.193, on 2 March 2020 at 10:05 a.m.

On 2 March 2020 at 10:05 a.m., goods train No. 56490 collided with a road motor vehicle at a regulated level crossing marked with road signs, at km 5.193, between the stations Ljutomer and the unoccupied loading bay Gornja Radgona.

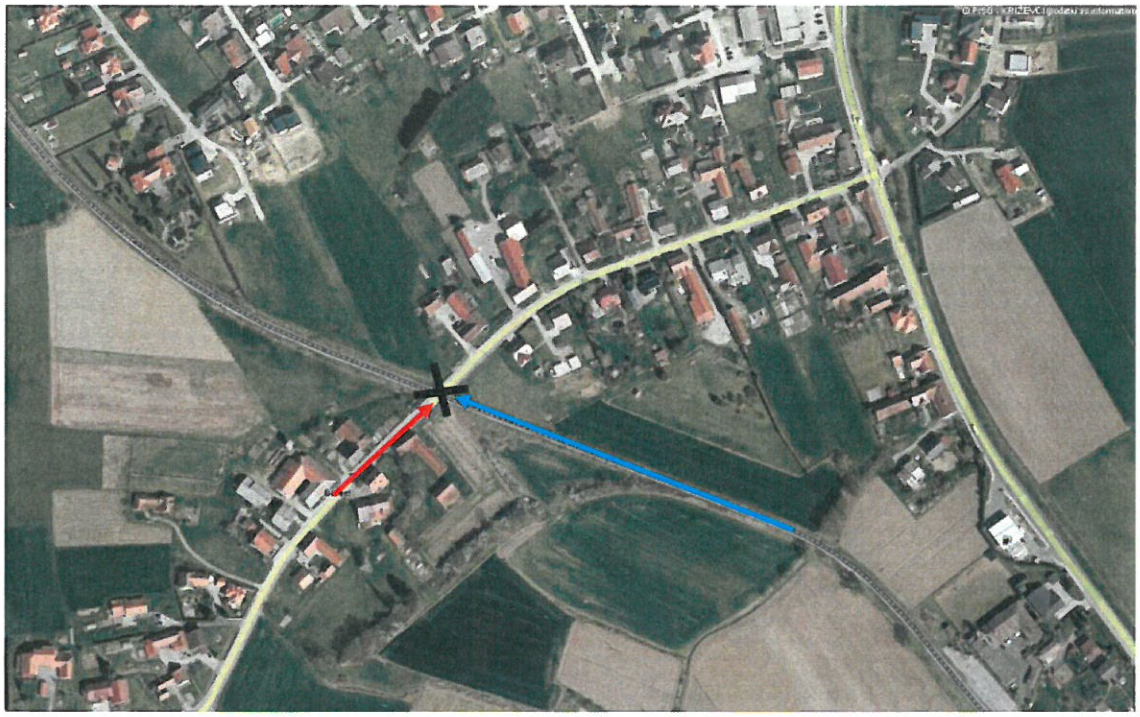
Goods train No. 56490 was travelling on the regional, single-track non-electrified railway line No. 42 (Ljutomer - Gornja Radgona), from the starting station Ljutomer to the unoccupied loading bay Radenci, which was its final destination. The road motor vehicle entered the level crossing while driving on

the right side of local road No. 223181, from the direction of the roof tile factory Tondach Slovenija, d.o.o., in the village of Boreci, in the direction of regional road No. 1415.

At the moment when the train was approaching the level crossing, the goods road motor vehicle entered the hazardous area of the level crossing. The engine driver of the goods train could not have prevented the collision because the train was so close to the crossing when the driver of the goods road motor vehicle entered the hazardous area of the crossing that he was not able to take preventive action.

From the moment when the emergency brake was applied until the stopping of the train, train No. 56490 travelled approximately 120 m. Engine No. 664 -116 of train No. 56490 hit with the right fender of the front side the window of the front right door of the road motor vehicle Renault Captur in the direction of travel of the train. After the collision, the right fender of the locomotive became stuck in the right front door of the road motor vehicle. The train was pushing the vehicle in front of itself until it stopped.

Based on the position of the road motor vehicle after the collision and the tyre mark traces of the road motor vehicle that were left on the paved road as the train was pushing it, it is possible to establish with certainty that the road motor vehicle entered the hazardous area of the railway line at the moment when the train was approaching.



Picture No. 1: A red arrow shows the direction of travel of the road motor vehicle in the direction of the village of Boreci on the local road, a blue arrow shows the direction of travel of goods train no. 56490, which was travelling from Ljutomer towards Gornja Radgona, and a black cross marks the site of collision.

Train No. 56490 collided with the road motor vehicle at a speed of 40 km/h. After the collision, the front of the train stopped at km 5.288,6. From the point of collision with the road motor vehicle to the point of stoppage, the train travelled 95.6 m.

Causes:

The direct cause of the collision of goods train No. 56490 with the road motor vehicle that drove onto the crossing of the local road and single-track railway line at the moment when the train was approaching the level crossing was insufficient visibility of the railway line from the road in the direction of Ljutomer station due to the vegetation that grows on the left side of the railway line and blocks the view. 274 metres before the level crossing, the railway line turns left and then goes straight. For the entire length of the curve, the left side of the railway line is overgrown with shrubbery that continues straight all the way to the area, 70 m before the level crossing, which blocks the view of the railway line to road traffic participants.

The driver of the road motor vehicle did not manage to move away from the area of the level crossing in time while crossing the railway line with the vehicle.

Consequences:

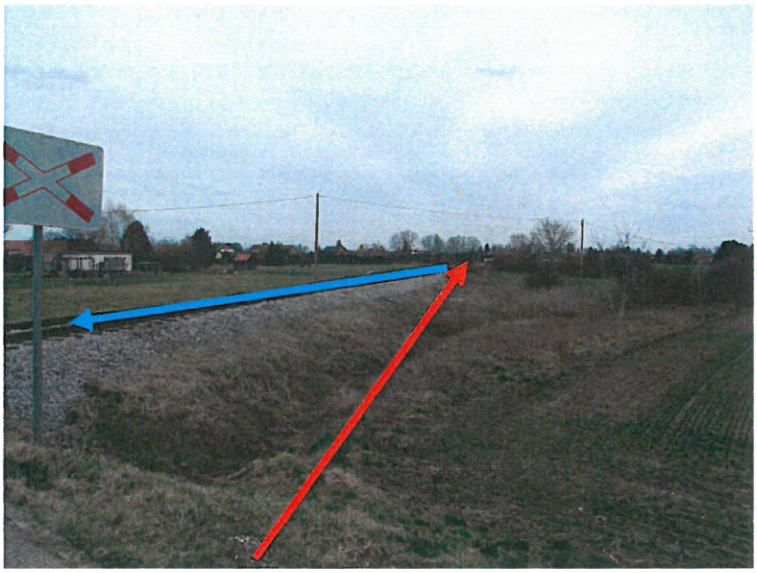
The consequences of the collision of goods train No. 56490 at a regulated level crossing with a local road, marked with road signs, between the stations Ljutomer and Gornja Radgona, on 2 March 2020 at 10:05 a.m are:

- fatal injuries to the driver of the road motor vehicle;
- minor damage to the front of diesel engine 664-116;
- a completely destroyed road motor vehicle.

Recommendations:

To avoid similar accidents in the future, the following recommendations are issued to:

1. the road infrastructure manager, the Municipality of Križevci:
   1. Warning transverse lines – sound signs to be installed on the road before level crossing 5.2 at km 5.193 from both sides of the level crossing, to warn road traffic participants that they are nearing the level crossing. These are additional means to bring to the attention of road traffic participants that they are nearing the hazardous area of the level crossing. Transverse warning lines are drawn so that their frequency increases as the road approaches the level crossing.
2. to the railway infrastructure manager, SŽ – Infrastruktura, d.o.o.:
   1. removal of vegetation, shrubbery and tall overgrowth from the railway line strip along the left curve all the way to the level crossing.



Picture No. 2: A red arrow shows the view of the railway line from the direction of the level crossing for road traffic participants, and a blue arrow marks the direction of travel of goods train No.56490, which collided with the road motor vehicle on 2 March 2020.

An analysis of road traffic at the level crossing and the existing road and railway infrastructure showed that the trees and tall shrubbery in the immediate vicinity of the level crossing pose a very high risk for road traffic participants who cross the railway line.

Wheel fracture on the 17th wagon of goods train No. 53202, between the stations Pivka and Gornje Ležeče, allegedly at km 655.150, on 31 March 2020, at 3:00 a.m.

On 31 March 2020 at 03:22 a.m., the train driver who had finished his work shift of operating train No. 53202 on track No. 6 at Divača station, noticed sparks under the wheels of the 17th wagon while the train was being set in motion in the direction of the Koper Tovorna final station. As soon as he noticed the sparks, the driver whose shift had ended called the other driver, who was proceeding to drive the train in the direction of Koper Tovorna and demanded that the train be immediately stopped.

During the inspection of the wagon, the driver, after stopping the train running in the direction of Rodik station, found that the first axle of the second bogie of the 17th wagon in the direction of travel of the train No. 31 81 537 5060-5, was blocked. He found that the brake triangle on this axle was warped and pushed under the floor of the wagon. The initial inspection of the wagon was carried out

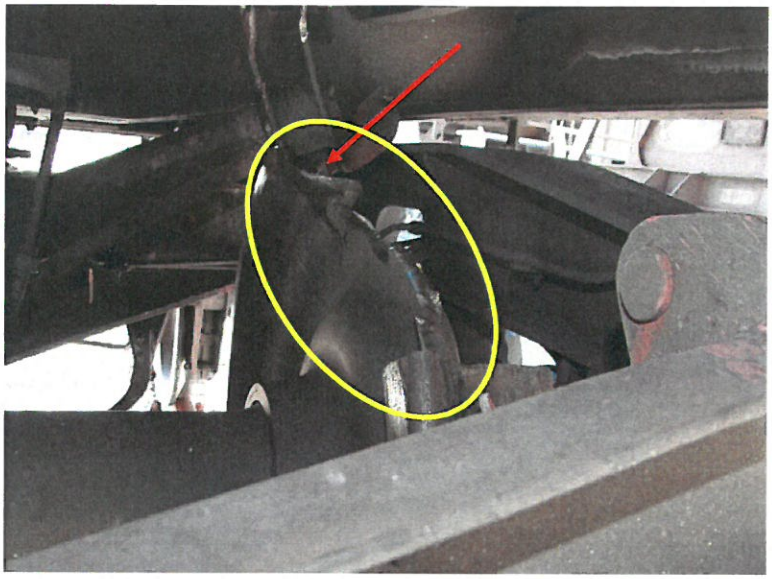
at night, so it was not possible to establish the condition and position of the blocked wheel or to see that the left wheel was fractured. During the examination, he found that the brake rigging was damaged and was blocking the first axle of the second bogie. On the wheels of the blocked axles, chips from the rubbing of blocked wheels against the rails (spots of accumulated chips) accumulated during the journey.

As the axle was blocked, the driver demanded that the wagon be detached from the train before continuing the journey.

The blocked axle created a risk of derailment of the wagon if the train had continued its journey, due to which the driver prohibited any movement of the wagon before the wagon was inspected by the authorised technical wagon activity worker.

During a more detailed inspection of the wagon in daytime, it was then found that while the train was heading towards Divača station, a piece of the left wheel of the first axle of the second bogie had broken off in the direction of travel of the train. At the point where the part of the wheel broke off, the brake triangle had then jammed into the brake shoe. The wheel then pulled the brake triangle along the right wheel under the wagon floor, where the brake shoe was stuck between the structure of the bogie and the floor of the wagon, thereby blocking the rotation of the whole axle.

After disconnecting the wagon, the train continued to travel towards the Koper Tovorna final station at 10:36 a.m.



Picture No. 1: A red arrow shows the point where the brake shoe became stuck in the edge of the fractured wheel, and a yellow rhombus shows the area of the wheel fracture.

Causes:

The direct cause of the incident – a fracture of the left wheel of the first axle of the second bogie of the 17th wagon No. 31 81 537 5060-5 during the operation of goods train No. 53202, on 31 March 2020 was material fatigue as a result of monobloc overheating caused by the previous blocking of the brake system.

The part of the wheel that broke away from the monobloc when the train was heading towards Divača station was not found despite a search being carried out; as a result, the exact location of the fracture could not be determined.

Consequences:

The wheel fracture resulted in the jamming of the left brake block of the left brake shoe of the brake triangle behind the rim at the broken part of the monobloc, causing a blockage of the entire first axle of the second bogie at wagon No. 31 81 537 5060-5, in the direction of travel of the train.

Recommendations:

In order to avoid similar incidents in the future,

- the following recommendations are issued to the operator SŽ –Tovorni promet, d.o.o.:
  1. update the diagnostic system for the thermal overload of running gears of the railway rolling stock in operation;
  2. lay down procedures for handling wagons in which a thermal overload of running gears of the railway rolling stock is detected during operation;

- The following recommendation is issued to the public railway infrastructure manager, SŽ – Infrastruktura, d.o.o.:

lay down procedures for handling wagons in which a thermal overload of the running gears of railway rolling stock is detected during operation;

3.5 Explanation and introduction to, or background of, investigations

Until the issue of the 2020 Annual Report, the investigation body in rail transport failed to complete investigation procedures for three accidents that occurred in 2020. The deadline for the completion of the investigation prescribed in Article 6 of Directive (EU) 2016/798 of the European Parliament and of the Council of 11 May 2016 has not yet expired.

Investigations instigated in 2020, although not yet completed					
Date of accident	**Type of accident**	**Place of accident**	**Legal basis**	**Reason investigation was not completed or was suspended**	**Who, why, when (decision)**
4 June 2020	Collision of shunters on switch No. 105 of the Ljubljana station	Switch No. 105 of the Ljubljana station at km 565+136	Article 20 of the Railway Transport Act (ZZeIP)	Procedures prolonged due to the epidemic, investigation will be concluded in 2021	30 September 2021
2 September 2020	collision of passenger train No. 41401 with a road cargo motor vehicle	Level crossing, between Šentilj and Pesnica, at km 602+214	Article 20 of the Railway Transport Act (ZZeIP)	Procedures prolonged due to the epidemic, investigation will be concluded in 2021	15 October 2021
3 September 2020	collision of passenger train No. 3375 with a road cargo motor vehicle	NPr between the loading bay Mokronog and the station Trebnje, at km 17+032	Article 20 of the Railway Transport Act (ZZeIP)	Procedures prolonged due to the epidemic, investigation will be concluded in 2021	15 November 2021

3.6 *Accidents and events investigated in the last five years (2016-2020)*

[A table of railway accidents investigated between 2015 and 2019, i.e.: serious accidents, other accidents, incidents and safety studies, with data from 2015 to 2019 as per types of accidents, collisions of trains, collisions with obstacles, derailments, accidents of people and rolling stock while driving, fires on rolling stock, hazardous substances and other] (Item 3.1 should be supplemented with trends established in accident investigations.)

Accidents investigated		2016	2017	2018	2019	2020	Total
Serious accidents Paragraph one of Article 20 of the Railway Safety Directive	Collision						
	Derailment	2			1		3
	Level crossing						
	people and rolling stock during travel						
	fires on rolling stock						
	Other						
	hazardous substances						
Other accidents Paragraph two of Article 20 of the Railway Safety Directive	Collision		1	1			2
	Derailment		3	2	4		9
	Level crossing	4	3	1	4	4	16
	people and rolling stock during travel			1	1		2
	fires on rolling stock						
	Other		1	3		1	5
	hazardous substances						
TOTAL		6	8	8	10	5	37

Six serious accidents, other accidents or incidents in 2016, seven in 2017, eight in 2018, ten in 2019 and five in 2020.

All accidents investigated in 2020 took place at level crossings. Two involved road motor vehicles, one involved a cyclist and one involved a pedestrian. The cyclist and the driver of the road motor vehicle succumbed to their injuries sustained in the accidents. The pedestrian who was hit by a train while crossing the railway track sustained serious injuries, while in another case, the driver of the goods road motor vehicle that was hit by a train sustained light injuries in the accident.

For the investigation of the incident – wheel fracture on the 17th wagon during travel of goods train No. 53202, on 31 March 2020, an analysis of the wheel fracture was made. The analysis was made by the Institute for Metal Structures. The analysis showed that the fracture of the wheel (monobloc) was largely a consequence of the fissure advancing from the flange towards the wheelset axle due to fatigue. At the place where the fissure occurred, microfissures were also detected, running parallel to the traction surface, which most likely led to the wear of material on the traction surface of the wheel. It was established with electron microscopy that the fracture was ductile.

As individual examples of accidents are repeated only rarely, there was no need to draft more detailed studies on railway transport safety between 2011 and 2020.

4 RECOMMENDATIONS

Below is the table of realisation of the recommendations issued in the past 10 years.

Recommendations issued		Situation of recommendation implementation					
		Completed		In the process of implementation (or being drafted)		Will not be completed (rejected)	
YEAR	no.	no.	%	no.	%	no.	%
2011	6	5	83.3			1	16.7
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		
TOTAL	100	81	81	12	112	7	7

In 2020, the railway accident investigation body issued nine recommendations as follows:

- one referring to the arrangement of the company's parking lot located along the railway line so that the goods road motor vehicles parked there do not block the view of the railway track from the direction of the level crossing;

- one referring to the ban on the use of the level crossing for all vehicles longer than 4 m, as the use of the level crossing is too hazardous for long road vehicles due to the configuration of the road and railway infrastructure;
- three referring to the removal from the railway line strip of vegetation that blocks the view of the railway line for road traffic participants at the level crossing;
- one referring to markings on the road before the level crossing, optical and sound break for road traffic calming, which increases the awareness of road traffic participants that they are approaching the hazardous area of the level crossing;
- one referring to updating of the diagnostic system for the thermal overload of running gears of the railway rolling stock in operation;
- two referring to regulations for procedures for handling wagons in which a thermal overload of running gears of the railway rolling stock is detected during operation.

Chief Investigator of railway
accidents and incidents
Daniel Lenart, Secretary