



# **ANNUAL REPORT** 2020

## A word from the director



In terms of safety, the progress made proves that the effort of understanding and prevention pays off. We also know that this effort must be relentless in order to keep up with technical developments, new uses and the appearance of new players in addition to their simple demographic renewal.

On the occasion of the publication of this seventeenth activity report of the Bureau d'Enquêtes sur les Accidents de Transports Terrestres (BEA-TT), I would like to thank my collaborators and partners who, since my appointment on 9 March, have helped me to take the measure of my function and of our complementarities. I would like to pay tribute to Jean-Gérard Koenig, who created the BEA-TT, to Claude Azam and above all to my predecessor Jean Panhaleux, for their persevering and recognised action.

In 2020, 1908 safety occurrences were reported to the office. This figure, which is about 30% lower than in previous years, clearly reflects the effect of the covid-19 pandemic. In terms of land transport safety, this is a welcome development, but we must remain vigilant. In terms of the office's activity, this number still covers a large number of serious and complex accidents, and their analysis by the technical investigators led to the opening of nine investigations: five in the railway sector, one on a level crossing, two in the field of guided transport and one concerning inland navigation.

That same year, 25 recommendations were issued, through 11 investigation reports (2 on roads, 3 on NPs with 8 recommendations again as in 2019, 1 between road and tramway, 3 in guided transport including 1 in tramway, 1 in metro and 1 in RER, 2 in river). These figures, which are very close to those for 2019, show that the team has been able to maintain its production in teleworking.

The follow-up of the implementation of actions in response to the recommendations issued is an important complement to the BEA-TT's action. This report contains in its appendices the tables regularly provided by the Établissement Public de Sécurité Ferroviaire and by the Service Technique des Remontées Mécaniques et des Transports Guidés. In addition, this year there is a table produced by the Channel Tunnel Intergovernmental Commission, as well as two tables produced by the Directorate General for Energy and Climate and the Road Safety Delegation, which cover the road sector. I would like to thank all these contributors, old and new.

I hope you enjoy reading this 2020 activity report, and also invite you to visit <u>http://www.bea-</u><u>tt.developpement-durable.gouv.fr.</u>

Together with the entire BEA-TT team, we will be attentive to any suggestions you may have at <u>bea-tt@developpement-durable.gouv.fr</u>.

**Jean-Damien PONCET** 

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## **1** The missions and organization of the BEA-TT

## 1.1 Why technical accident investigations?

The human tragedies caused by transport accidents and the very spectacular damage they can cause remind us that people, equipment and organizations remain fallible.

The public authorities, victims and travellers have a constant need to learn from the most serious or complex accidents or incidents in an independent manner. These are the missions of the Accident Investigation Bureaux.

The BEA-TT's field of intervention covers rail transport, urban guided transport (metro and tramway), ski lifts, road transport (particularly freight transport and public passenger transport) and inland navigation; each of these sectors has its own regulations and its own economic, technical, professional and even cultural logic.

The decision to open a technical investigation is taken by the director of the BEA-TT, on his own initiative or at the request of the minister in charge of transport. In the railway sector, investigations must be carried out into serious accidents as defined by European Directive (EU) 2016/798 of 11 May 2016 on railway safety.

This technical investigation must remain quite distinct from the judicial investigation, whose objectives, centred on the search for responsibility, and constraints, particularly in terms of time, are not the same.

At the end of its investigations or studies, the BEA-TT makes its reports public on its website: <u>www.bea-tt.developpement-durable.gouv.fr</u>. It notifies the addressees of the safety recommendations it makes. The latter must inform the BEA-TT within 90 days of the action they intend to take on these recommendations. Their responses, or lack thereof, are also posted on the website.

#### **1.2 Organization and resources**

The BEA-TT is organized around its main mission, i.e., to carry out technical investigations into accidents and incidents. To this end, it mobilizes:

- its permanent investigators. Their appointment is tantamount to a commission to access all elements, testimonies and useful information, even those covered by professional or medical secrecy, or the secrecy of the judicial investigation;
- temporary investigators, commissioned by its director for the purpose of an investigation;
- > experts mobilized to answer specific questions.

The BEA-TT can also call on all the State services. This is particularly the case for the monitoring and reporting of accidents.

As of 1<sup>er</sup> January 2021, the BEA-TT has 14 agents: 2 managers, 9 permanent investigators including two heads of divisions, and 3 administrative agents. A doctor from the labour inspectorate is also attached to it to deal with medical aspects. The budgetary allocation for operations and studies amounted to €60,000 in 2020 and covered the needs of the department.

## 2 Accidents of the year 2020

## 2.1 Sources of information on accidents and incidents

As stipulated in the Transport Code, land transport incidents and accidents are reported to the BEA-TT as soon as possible after they occur. In practice, this reporting is mainly carried out by the flashes and reports of the Ministerial Operational Watch and Alert Centre (CMVOA) of the Ministries of Ecological Transition and Territorial Cohesion and Relations with Local Authorities, as well as by the daily alerts and reports of certain major transport operators.

The watch consists of exploiting this information: depending on the number of victims, the conditions and the social sensitivity of the accident, a brief analysis is carried out in order to understand the circumstances and to assess whether an investigation should be opened. This daily task is summarized in the table below.

The BEA-TT is mainly concerned with transport "carried out by professionals". Thus, for road transport, the events reported generally involve at least one vehicle transporting goods or people.

	Reported events	Events analyzed	Open surveys
Road, inland waterway and LC transport sector	908	331	2
Railway and guided transport sector	1000	203	7
Total	1908	534 (28 %)	9 <i>(0,47 %)</i>

The outcome of this analysis for 2020 is as follows:

## 2.2 Investigations opened in 2020

The BEA-TT has therefore launched 9 investigations in 2020 concerning:

- > in the **rail sector**, one overspeed, three derailments and one collision;
- > for **level crossings**, a collision between a TER and a light vehicle;
- > in the **field of guided transport**, the derailment of an RER train and a tram-train drift;
- > in the **field of inland navigation**, the collision of a lock with a barge.

### 2.2.1 Rail transport

#### 1) Overspeed of a TGV on 22 December 2019 in La Milesse (72)

On Sunday 22 December 2019, an SNCF Voyageurs TGV travelling on the Bretagne- Pays de la Loire high-speed line was diverted onto the adjacent track at La Milesse when another TGV stopped in front of it. The geometry of the diversion switch allows it to be passed safely at a speed not exceeding 100 km/h. However, the train was travelling at 165 km/h. It was running under ETCS\* level 2, the European interoperable rail signaling system, and the maximum authorized speed displayed to the driver in the cab was 170 km/h. This overspeed constitutes an unsafe event, the consequences of which, in less favorable circumstances, could have been serious.

<sup>\*</sup> ETCS: European Train Control System

#### 2) Derailment of a TGV on 5 March 2020 in Ingenheim (67)

On Thursday 5 March 2020 at 7.32 am, SNCF Voyageurs' TGV 2350 hit a mound of earth covering the track on the East European high-speed line at 284 km/h. The impact derailed the power car and the first three trailers. The articulated parts of the train remained together and continued to run without deviating from the railway platform until they came to a complete stop 1,635 meters after the impact. The derailed wheels remained guided on the rails. The mound of earth struck was caused by the collapse of an embankment adjacent to the track a few minutes earlier. The human toll of this accident was one serious injury, the train driver, and 21 minor injuries among the 307 people on board. The damage to the track and rolling stock was extensive.

## 3) Striking of three maintenance workers by a TER on 18 March 2020 in Schiltigheim (67)

On Wednesday 18 March 2020 at 9.37 am, three SNCF Réseau staff were hit by an TER travelling at 95 km/h in the commune of Schiltigheim. The team was carrying out a periodic surveillance tour on the tracks. The safety officer had previously had a telephone conversation with the signal box about the state of traffic.

The human toll of the accident was one officer dead, one officer seriously injured and one officer slightly injured.

#### 4) Derailment of a freight train on 19 August 2020 in Villeneuve-sur-Yonne (89)

On Wednesday 19 August 2020, an SNCF Freight combined transport train travelling between Villeneuve-sur-Yonne and Saint-Julien-du-Sault in the Yonne region derailed a bogie on its 29<sup>e</sup> wagon. The train travelled 8 km before being stopped by the driver, who was alerted by a cross-train. The accident wagon was loaded with two tank containers, one of which was carrying a flammable hazardous material. An axle box, torn off on the derailed bogie, was found on the track after the point of derailment.

The track was damaged and rendered unusable for the 8 km of the derailment.

#### 5) Derailment and fire of a freight train on 17 September 2020 in Corbonod (01)

On Thursday 17 September 2020, a mineral water train operated under the certificate of the railway company RegioRail derailed from an axle of the fifth wagon. The train driver is quickly alerted by the driver of the "push" locomotive at the end of the train, who is shaken by the damage to the track. The driver stopped the train and, on inspecting the train, noticed the derailment and a fire in the damaged wagon. The fire brigade was alerted and extinguished the fire.

At the rear of the train, the track was destroyed for the 2.8 km that the train had travelled between the point of derailment and the point where the train stopped. An axle box that had fallen off the derailed axle was found on the track upstream of the point of derailment.

#### 2.2.2 Level crossings

#### Collision between a TER and a light vehicle, 9 October in Bourg-en-Bresse (01)

On Friday 9 October 2020, at 10:34 am, a TER coming from Bourg-en-Bresse (01) and bound for Oyonnax (01) collided with a light vehicle at level crossing no. 7 in the commune of Bourg-en-Bresse. This crossing was equipped with automatic light and sound signals with two half barriers. The TER, at a speed of 100 km/h, threw the light vehicle more than 30 meters downstream, killing both occupants instantly. Despite the violence of the impact, the train did not derail. None of the 20 passengers was injured.

### 2.2.3 Guided transport

#### 1) RER B train derailment on 24 June 2020 in Paris at Denfert-Rochereau

On Wednesday 24 June 2020 at 18:45, an RER B (RATP) train left a parking track at Denfert-Rochereau station empty. While maneuvering at low speed towards the main tracks, the train derailed as it passed a switch. One of the wheels on the left side of the train climbed onto the rail. The train continued to run for several dozen meters, and seven axles were finally off the rails. Four switches and catenary equipment were damaged, preventing any traffic. The repair work was completed on 28 June, when train traffic was able to resume normally.

#### 2) Drift of a tram-train of line T4 on 8 November 2020 in Clichy-sous-Bois (93)

On Sunday 8 November 2020, on the Parisian tram-train line T4 (SNCF), a train in commercial traffic is travelling on a 7% ramp between Maurice Audin and Clichy-sous-Bois-Mairie stations. At the top of the ramp, the driver of the tram-train reduces his speed in order to stop in front of a stop sign forbidding him to cross a crossroads. The train then reversed downhill until it reached a speed of 63 km/h. It was finally stopped by the driver using emergency braking after drifting 430 meters. There were no injuries and no material damage.

#### 2.2.4 Inland waterway transport

## Breakage of a lock gate during lockage of a barge transporting dangerous goods on the Rhône at Sablons (38) on 18 February 2020

During the night of 17 to 18 February 2020, the "Pampero", a tanker belonging to the CFT company, was travelling up the Rhône carrying 2,200 tons of vinyl chloride. Shortly after midnight, it entered the Sablons lock operated by the Compagnie Nationale du Rhône (CNR). When the lock chamber was two-thirds full, the intermediate part of the gate gave way. The boat was dragged backwards by the current created and was then ejected from the lock chamber, taking the upper part of the gate with it, while the wheelhouse was torn off and damaged the external pipes connecting the gas tanks. The crew members, 2 on maneuvers and 3 on night rest, were able to leave the wheelhouse in time, stabilize the vessel and evacuate it in an emergency. Some of them suffered minor injuries. The boat was heavily damaged and cannot be repaired. In order to secure the ship, to seal the gas leaks, to carry out the unloading operations, and to carry out the studies and work for the installation of anew temporary lock gate, inland navigation was interrupted until 28 March.

## 3 Reports published in 2020

## 3.1 Rail transport

Three accidents involving rail traffic were the subject of published investigations in 2020. They all occurred at level crossings and are presented in a dedicated chapter.

#### Monitoring the implementation of recommendations

The Établissement public de sécurité ferroviaire (EPSF) monitors the implementation of the recommendations that the BEA-TT addresses to the rail transport players.

On the basis of this follow-up, the state of progress in the operational implementation of the recommendations transmitted between 2004 and 2020 to these operators is as follows

Year of	Nur	Number of recommendations made and followed up			
publication of the	Tatal	C	Closed		
report	Total	Achieved	Not accepted	in progress	
2004-2006	30	29	0	1	
2007-2009	64	62	2	0	
2010	15	13	1	1	
2011	10	10	0	0	
2012	15	9	4	2	
2013	12	11	0	1	
2014	10	9	0	1	
2015	14	12	0	2	
2016	23	21	0	2	
2017	17	11	0	6	
2018	5	4	0	1	
2019	20	5	0	15	
2020	7	1	0	6	
Total 2004-2020	242	197	7	38	

Note: This table includes the follow-up of recommendations concerning level crossing accidents.

The follow-up to the Channel Tunnel recommendations is carried out independently by the Channel Tunnel Intergovernmental Commission. The follow-up is as follows with regard to the fire on board a Eurotunnel freight shuttle on 17 January 2015, the latest accident under investigation.

Year of	Nur	Number of recommendations made and followed up				
publication of the	Total	С				
report	TOTAL	Achieved	Not accepted	in progress		
2016	6	4	0	2		

## 3.2 Level crossings

## 3.2.1 Published investigations

Three investigations into level crossing accidents were concluded in 2020. The table below shows the nature, location and dates of these accidents, which cost the lives of five people. In terms of Article L. 1621-1 of the Transport Code, none of these accidents constitutes an accident in terms of their consequences

Date	Nature and location of the accident	No. of fatalities
03/09/2018	Pedestrian hit by a TER in Nouan-le-Fuzelier (41)	1
07/05/2019	Collision between a TER and a light vehicle in Saint-Etienne (42)	0
15/07/2019	Collision between a TER and a light vehicle in Avenay-Val-d'Or (51)	4

In the case of the "serious" cases, a technical investigation was mandatory.

#### 3.2.1 The recommendations issued

In conclusion of these 3 reports, 8 recommendations were formulated by the BEA-TT.

#### Nature of the recommendations

- > 1 concerns the improvement of the legibility of a LC;
- > 1 concerns the improvement of visibility on approach to a LC;
- > 2 concern the improvement of the layout of the station adjacent to the LC;
- > 2 concern road, light and directional signage improvements;
- 1 concerns the deployment of concrete actions following the risk analyses carried out on the safety of LCs;
- > 1 concerns the approval of vehicle safety equipment.

#### Recipients

These recommendations were addressed to several recipients

- > 3 to the infrastructure manager of the national rail network ;
- 1 to the station manager ;
- > 3 to the road manager of a metropolis ;
- > 1 to a central directorate of the ministry responsible for regulation.

#### Follow-up planned by the addressees

The table below shows the action taken by the recipients to date

Investigation	Recommendations			
	Number	Accepted	Not accepted	No answer
Nouan-le-Fuzelier	3	3	0	0
Saint-Etienne	4	1	0	3
Avenay-Val-d'Or	1	1	0	0
TOTAL	8	5	0	3

#### 3.2.2 Summaries of published investigation reports

Pedestrian hit by a regional express train on 3 September 2018 in Nouan-le-Fuzelier (41)



On Monday 3 September 2018 at 6.41pm, a 15-year-old teenager was hit by a train as he crossed the tracks on the guarded and closed level crossing at Nouan-le-Fuzelier station. After getting off a TER train serving the station, the teenager had put on a headset and set off to cross the tracks at the back of his train via the level crossing in order to reach the town center. He was hit by a cruiser train travelling at 145 km/h. He died while being taken to hospital.

The route used, which was shorter than the normal exit but signed as forbidden to passengers, deprived him of observing the level crossing signage which was lit and of stopping by the gates which were closed. His attention was taken up by his smartphone and he did not hear the warning calls of the barrier guard and others who got off the same train. He continued to cross.

The BEA-TT made three recommendations to SNCF Réseau concerning:

- > the removal of escape routes to and from the quays at Nouan-le-Fuzelier and Theillay;
- > the improvement of safety and directional signage at Nouan-le-Fuzelier station;
- the translation of the studies carried out on the knowledge of pedestrian accidents at level crossings into concrete safety actions.

The report also makes an invitation concerning the content of SNCF Réseau's internal documentation dealing with guarded level crossings.

http://www.bea-tt.developpement-durable.gouv.fr/nouan-le-fuzelier-r272.html

Collision between a regional express train and a light vehicle 7 May 2019 on LC 302 in Saint-Étienne (42)



On Tuesday 7 May 2019, at around 3.10 pm, regional express train no. 889 925 coming from Boën-sur-Lignon (42) and bound for Saint-Étienne Chateaucreux station (42) collided with a light vehicle at level crossing no. 302 in the commune of Saint-Étienne.

During the impact, the TER, which was travelling at a speed of 88 km/h, did not derail or overturn.

Only one occupant was in the road vehicle. The 20-year-old driver was not injured. No injuries were reported among the 13 passengers and the train driver.

The direct cause of the accident was the failure of the light vehicle to stop, despite the flashing red lights and the barrier that required it to do so. This vehicle bypassed the central island upstream of the LC and entered the opposite traffic lane, without encountering any vehicles, since they were stopped in front of the other half barrier.

Several factors may have played a role in the occurrence of the accident:

- the attention of the driver of the road vehicle was focused on his phone as a navigation aid;
- the road junction near the LC has traffic lights, some of which are green when the LC is closed;
- LC 302 is located in an urban environment with many visual attractions (directional signs and advertising boards).

The BEA-TT has made recommendations on:

- Improved legibility for vehicles approaching from the north and at the LC;
- the design and operation of the crossroads managed by traffic lights.

http://www.bea-tt.developpement-durable.gouv.fr/saint-etienne-r281.html

Collision between a regional express train and a light vehicle 15 July 2019 on LC 2 in Avenay-Val-d'Or (51)



On Monday 15 July 2019, at 9.45 am, Regional Express Train (TER) no. 839 945 coming from Épernay (51) and bound for Reims (51), collided with a light vehicle at level crossing no. 2 in the commune of Avenay-Val d'Or (51). This crossing was equipped with automatic light and sound signals with two half barriers.

The four occupants of the light vehicle, the 37-year-old driver and three children aged 10, 3 and 10 months, were killed instantly.

The collision occurred while the TER was travelling at a speed of 116 km/h.

Twenty passengers and a driver were on board the train, which did not derail. Four passengers on the TER were slightly injured.

The direct cause of the accident was the failure of the light vehicle to stop at the closed level crossing.

The presence of a toxic dose of a drug in the driver's body most likely played a role in the occurrence of the accident by impairing her ability to drive.

In view of the contextual elements identified and the high level of seriousness generally observed for all users involved in these types of accidents between a train and a road vehicle, the BEA-TT is led to seek preventive orientations in the fields of the visibility of the closed state of a level crossing and in the driving assistance for road vehicles.

http://www.bea-tt.developpement-durable.gouv.fr/avenay-val-d-or-r284.html

## 3.3 Road transport

## 3.3.1 Published investigations

Two reports dealt with road traffic accidents.

Date	Nature and location of the accident	No. of fatalities
26/05/2018	Bus accident on the A7 at Chantemerle-les-Blés (26)	3
10/03/2019	Fire in a coach on the A6 at Coudray-Monceaux (91)	0

The first investigation concerns the sudden shift to the right of the passenger vehicle after the right front tire exploded. The analysis highlights the need for regular checks on this type of equipment and the imperative need to keep seatbelts fastened.

The second fire was not the result of an accident; the bus was the sole cause. The fire, which broke out at the terminals of an electrical circuit on the roof, gave off black, opaque smoke which quickly invaded the passenger compartment. This event once again highlights the importance, in an emergency evacuation situation, of looking for measures to allow the rapid opening of smoke extraction devices and emergency exits on coaches.

#### 3.3.2 The recommendations issued

#### Nature of the recommendations

At the end of these two investigations, the BEA-TT issued 4 recommendations:

- I relates to the resistance performance of window panes as emergency exits in passenger vehicles;
- > 2 concern the monitoring of tyre condition and impact resistance;
- 1 concerns the wearing of seat belts.

#### Recipients

These recommendations were addressed to several recipients:

- > 1 to an association of tire manufacturers;
- > 2 to a Directorate General of the Ministry in charge of regulation;
- > 1 to a federation of passenger transporters

#### Follow-up planned by the addressees

The table below shows the action taken by the addressees to date.

Investigation	Recommendations			
investigation	Number	Accepted	Not accepted	No answer
Chantemerle-les-Blés	3	2	0	1
Coudray-Montceaux	1	1	0	0
ΤΟΤΑ	4	3	0	1

## 3.3.3 Summaries of published investigation reports

Bus accident on 26 May 2018 on the A7 motorway in Chantemerle-les-Blés (26)



On Saturday 26 May 2018 at around 10.47pm, a coach travelling on the A7 motorway with 31 people on board, including 18 children, swerved sharply to the right, hit the concrete barrier lining the road, overturned on its right-hand side, slid off and came to rest on the hard shoulder.

The accident resulted in the death of the driver and two passengers of the coach, all three of whom were ejected in the accident. Eight passengers were declared in absolute emergency and six in relative emergency. Fourteen passengers were uninjured.

The severity of the accident was most likely due to the driver and several passengers not wearing seatbelts.

The accident caused extensive damage to the coach and moderate damage to the road infrastructure.

The direct and immediate cause of this accident was the sudden loss of control of the coach as a result of the explosion of the right front tire.

The analysis of this tire showed that a previous impact on the tread was most likely the cause of the loss of mechanical properties of the rubber, which, over the course of the kilometers travelled, led to the degradation of the tire structure until it burst.

The BEA-TT made recommendations on:

- checking the internal condition of the tires during any dismantling;
- > the definition of specifications relating to the resistance of tires to external impacts;
- $\succ$  the wearing of seat belts.

http://www.bea-tt.developpement-durable.gouv.fr/chantemerle-les-bles-r268.html

Bus fire on 10 March 2019 on the A6 motorway in Le Coudray-Montceaux (91)



On Sunday 10 March 2019 at around 6.30 am, a fire broke out on board a coach travelling on the A6 motorway towards Paris, near the town of Le Coudray-Montceaux (91). The driver parked his vehicle on an asphalt area bordering the hard shoulder of the motorway. The 50 passengers and the two drivers managed to evacuate the coach.

One of the passengers injured his hand when he tried to break a window before stopping. The fire had no other physical consequences except, for some passengers, the inhalation of toxic gases without lasting consequences.

In material terms, the entire coach was burnt, including the luggage it was carrying in the hold. The trailer was only slightly damaged by the flames.

The direct cause of the fire was an overheating of the fixing terminal of the electrical cable supplying the control panel of the air conditioning unit located on the roof of the coach. The high temperature rise is believed to be due to abnormal resistance or insufficient contact area of the fixing terminal caused by a loose or insufficiently tightened nut.

The activation of the flames by the ventilation system, as well as the malfunctioning of the two fire extinguishers on the coach, may have contributed to the spread of the fire.

The BEA-TT issued one recommendation and two invitations on :

- the procedures for checking fire extinguishers during the periodic technical inspection of heavy vehicles;
- > the marking of smoke evacuation devices fitted to coaches;
- the ease of breaking emergency exit windows.

http://www.bea-tt.developpement-durable.gouv.fr/coudray-montceaux-r273.html

## 3.4 Guided transport

## 3.4.1 Published investigations

Four investigations into guided transport accidents were concluded in 2020. These accidents did not result in any fatalities.

Date	Nature and location of the accident	No. of fatalities
12/06/2018	Derailment of an RER B train at Saint-Rémy-lès-Chevreuse (78)	0
21/12/2018	Derailment of a train on line M2 of the Marseille metro (13)	0
22/02/2019	Pedestrian hit by a tram in Bordeaux (33)	0
27/02/2019	Collision between a tram and a bus in Paray-Vieille-Poste (91)	0

There are two investigations into the derailment of a train in commercial traffic. One deals with technical aspects concerning the safety of the infrastructure, the other with mechanical aspects of interaction between the rolling stock and the infrastructure.

The other two investigations concern accidents with users of urban space, namely a pedestrian on a pedestrian crossing and a bus at a road junction.

### 3.4.2 The recommendations issued

Eleven recommendations were made by the BEA-TT.

#### Nature of the recommendations

Of these 11 recommendations :

- 3 relate to the risk of derailment due to a component of the rolling stock falling onto the track;
- > 5 concern the urban insertion of the tramway, including :
- > 2 concern the improvement of pedestrian crossings,
- 3 relate to the operation of road and tramway traffic lights, their synchronization and the consideration of a clearance time adapted to the characteristics of long road vehicles,
- $\succ$  2 deal with flood risk;
- 1 concerns the training of drivers of public transport vehicles using natural gas and relates to the specific risks of these vehicles.

#### **Recipients**

Three of the above recommendations were each addressed to several addressees with the same wording, so that the total number of recommendations received by addressees under the investigations under consideration amounts to 14, of which

- > 7 to an operator and the union of such operators, the Union des Transports Publics ;
- > 2 to a mobility organizing authority and to the grouping of such authorities;
- 2 to a road infrastructure manager ;
- 2 a State bodies: the Technical Service for Ski Lifts and Guided Transport and the Road Safety Delegation;
- > 1 to a turnout builder.

#### Follow-up planned by the addressees

The table below shows the follow-up by the addressees at the end of 2020.

	Recommendations				
Investigation	Number	Accepted	Not accepted	No answer	
Saint-Rémy-lès-Chevreuse	2	2	0	0	
Marseille	4	4	0	0	
Bordeaux	2	2	0	0	
Paray-Vieille-Poste	6	2	0	4	
TOTAL	14	10	0	4	

### 3.4.1 Follow-up on the implementation of the recommendations

On the basis of the monitoring carried out by the Technical Service for Guided Transport and Cableways (STRMTG), the status of the operational implementation of the recommendations made between 2014 and 2020 following guided transport accidents, and which have received a response, is as follows

Year of publication of the	Number of recommendations made and followed up			
report	clo		losed	
	lolai	made	Not accepted	in progress
2014	0	0	0	0
2015	3	0	0	3
2016	7	5	0	2
2017	14	0	2	12
2018	6	4	0	2
2019	3	0	0	3
2020	10	0	0	10
Total 2014-2020	47	9	2	32

### 3.4.3 Summary of published investigation reports

**RER B train derailment** on 12 June 2018



On Tuesday 12 June 2018 at 5 a.m., on line B of the Ile-de-France RER, between the stations of Saint-Rémy-lès-Chevreuse and Courcelle-sur-Yvette, on the boundary between Essonne and Yvelines, a train travelling to Paris derailed and partially went down.

The front engine remains on the track, while the 2<sup>e</sup>, 3<sup>e</sup> and 4<sup>e</sup> cars are lying on their left side and have tipped over into the ditch. The trailing train, which remained clinging to the derailed cars, also remains on the track.

The seven passengers on board the train were taken care of by the fire brigade. No serious injuries were reported. Three slightly injured people were taken to hospital and will be released in the afternoon.

The direct cause of the accident was the hollowing out of the embankment supporting the track over a length of about fifteen meters and to a depth of about four meters.

This hollowing out was caused by scouring due to overflow over the line embankment, following heavy rainfall in the Paris region that night.

Three factors contributed to this accident:

- > an exceptional and locally abundant rainfall episode, on already saturated soils;
- > a network of hydraulic transparency of the railway embankment which is underdimensioned and whose maintenance in good working order is perfectible;
- > the absence of measures to adapt current operations following the Météo-France warning messages.

The BEA-TT issued two recommendations to RATP in the following areas:

- mapping of areas at risk during bad weather and study of defenses;
- > the definition of operational measures in the event of warning messages from Météo-France.

He also issued two invitations concerning maintenance work on the hydraulic structures, and work to improve the hydraulic outlet in the accident area.

http://www.bea-tt.developpement-durable.gouv.fr/saint-remy-les-chevreuse-r270.html

## Derailment of a metro train on 21 December 2018 in Marseille (13)



On Friday 21 December 2018, at 8.25am, a train on line 2 of the Marseille metro derailed from a bogie, just after it left the Sainte-Marguerite-Dromel terminus station in the direction of Bougainville.

The train was carrying around 100 passengers who were evacuated in good conditions. Fourteen people injured as a result of the shocks were taken care of by the marine fire brigade. After the train was removed and the track was repaired and checked, the line resumed operation at around 4pm the next day.

The cause of the derailment of the train was the loss of a part of a motor bogie in a switch core. This was a negative friction wheel. It obstructed the passage of the wheels and caused the wheels of the following bogie to rise and derail. The derailed bogie remained close to its track but pushed the power supply side bar against the tyre tread of the adjacent track. This triggered the disconnection of the power supply and thus the automatic stop of the train.

The loss of the part was due to its prior breakage: a shock applied laterally by a track element produced a bending moment on the part that was not foreseen in the design. After this breakage, a holding rod still connected the elements. This connecting rod broke at Sainte-Marguerite station, causing the part to fall.

Two parts of the switch can be the cause of the impact: a protruding angle of the shoulder of the guard rails, or a sharp edge of the so-called direct hare's foot.

Two factors contributed to the accident:

> the failure to assess the risk of interaction between the track and the bogie part at the design stage, and consequently the absence of a maintenance prescription for the switches to prevent this risk from developing;

> the failure to identify the recurrence of previous breakages of this part as a precursor to a safety hazard.

The BEA-TT issued 3 recommendations and 2 invitations:

> the treatment of the risk of loss o f a rolling stock component in the preliminary hazard analysis prior to the commissioning of equipment;

> identification of potentially hazardous components and their treatment;

> comprehensive treatment of the risks related to the interface between the track and the negative or mass friction of the rolling stock, in particular in the track and rolling stock maintenance manuals;

> feedback on the loss of a part.

http://www.bea-tt.developpement-durable.gouv.fr/marseille-sainte-marguerite-r277.html

## Pedestrian struck by a tram 22 February 2019 quai des Chartrons in Bordeaux (33)



On Friday 22 February 2019 at 9.22pm, on the quays of the Garonne in Bordeaux, a tramway train travelling on line B between the "Chartrons" and "Cours du Médoc" stations struck a woman who was using a pedestrian crossing of the tramway platform.

The impact occurred at t h e front right of the train. The pedestrian hit was thrown forward 12 meters, slightly to the side of the platform. The train was stopped by the driver immediately after the impact.

The victim, unconscious and in absolute emergency, was evacuated by the SAMU. She left the hospital after a long coma and more than two months of convalescence.

This accident occurred against a backdrop of an increase in the number of accidents involving pedestrians on the Bordeaux tramway network.

The cause of this accident was the late perception of the tram train by the pedestrian. The pedestrian ran into the lane in front of the tram, while the speed of the tram did not allow the driver to stop in time.

Several factors contributed to this accident and to the severity of the injuries after the impact:

- the lack of signs or devices on the crossing which direct people to pay the necessary attention to the danger of tram traffic;
- the presence of an advertising hoarding on the edge of the road, which obscured the visibility of the pedestrian and also that of the tram driver;
- possibly alcohol consumption shortly before the accident, which may have affected the victim's alertness;
- the speed of the tram, which exceeded the speed limit for a pedestrian in the immediate vicinity of a crossing, the driver having been surprised by the fast-moving pedestrian and his visibility having been obscured by the billboard;
- Possibly the geometry of the front of the tram, which is a fairly flat surface that does not favor the deflection of a person hit rather than their projection.

The BEA-TT issued two recommendations and two invitations concerning the treatment of visibility masks, the rules of conduct for trams and the layout of pedestrian crossings of tram platforms.

http://www.bea-tt.developpement-durable.gouv.fr/bordeaux-r279.html

Collision between a T7 tram and a bus 27 February 2019 in Paray-Vieille-Poste (91)



On Wednesday 27 February 2019 at around 1.20 pm, in the commune of Paray-Vieille-Poste (91), a train of the T7 tramway line, travelling towards the "Villejuif - Louis Aragon" terminus, collided with a bus travelling on rue Marcel Albert in the north direction. The coach was operating the regular 91.10 line of the IIe-de-France bus network.

Under the impact, the train derailed from two of its three bogies. As a result of this accident, one person was hospitalized for five days and six passengers in the coach were slightly injured; four passengers in the tram were slightly injured.

The direct cause of the accident was that the bus crossed the intersection while the traffic lights required it to stop.

The failure of the coach driver to see the road lights, the tram driver's attention to an oncoming vehicle and the lack of emergency braking by the tram contributed to the collision.

The BEA-TT issued four recommendations and three invitations concerning:

- the layout and signaling of the intersection between rue Marcel Albert and the tramway platform (junction no. 38), as well as the operating principles of the traffic lights;
- anticipatory driving among tram drivers;
- > the monitoring of accidents by the various actors.

As part of this investigation, the BEA-TT also analyzed the safety issues related to the motorization of natural gas vehicles, with which the accident coach was equipped. Although the mode of propulsion of the coach did not play a role in the accident, this analysis leads the BEA-TT to issue a recommendation and an invitation concerning the training of drivers of public transport vehicles running on compressed natural gas.

http://www.bea-tt.developpement-durable.gouv.fr/paray-vieille-poste-r280.html

## 3.5 Inland waterway transport

## 3.5.1 Published investigations

Date	Nature and location of the accident	No. of fatalities
06/04/2018	Striking of a motorway bridge by a passenger boat in Givors (69)	0
19/08/2019	Striking of a bridge by a passenger boat in Bordeaux (33)	0

For the Bordeaux accident, the investigations concluded that there were no factors that could give rise to preventive recommendations. The investigation was closed with the publication of a summary of the findings online in lieu of a report.

The Givors accident highlighted the need to reinforce river signage, day and night, on the approach to the bridge that was hit.

### 3.5.2 -The recommendations issued

2 separate recommendations were made by the BEA-TT.

#### Nature of the recommendations

- 1 concerns information signage;
- > 1 concerns guidance sign on the approach to a structure.

#### Recipients

These two recommendations were addressed to the Compagnie Nationale du Rhône, operator of the waterway concerned.

#### Follow-up planned by the addressees

The table below shows the follow-up by the RCN.

		Recom	mendations	
Investigation	Number	Accepted	Not accepted	No answer
Givors	2	2	0	0

### 3.5.1 Summary of the published investigation report

Striking of a motorway bridge by the passenger boat BIJOU DU RHÔNE 6 April 2018 in Givors (69)



The passenger boat "Bijou du Rhône" operates cruises on the Saône and Rhône rivers between Chalon-sur-Saône and Arles. It left Lyon at the start of the cruise and is now travelling down the Rhône, about to pass under the A47 motorway bridge near the town of Givors on Friday 6 April 2018 at 11.40pm.

Three quarters of the way through the channel, the vessel struck a bridge pier in the middle of the river on its starboard beam. A leak occurred in a crew cabin. The captain decided to tie up as quickly as possible in order to secure the 127 passengers and crew.

Once at the quayside, the passengers were evacuated from the boat with the help of the land-based rescue services that arrived quickly on the scene. No injuries were reported.

The investigations carried out established that the direct cause of the accident was the incorrect approach to the bridge by the boat, which was too far to the right of the channel.

Several factors may have contributed to the occurrence of this accident:

- a strong current with a downstream boat sailing through a meander of the Rhône with a bridge in the middle;
- > the bridge piers positioned in the center of the river;
- only two spars, on the port side at 350 m and on the starboard side at 15 m upstream of the bridge, indicate the limits of the channel; these beacons do not have lights visible at night.

The BEA-TT has formulated preventive recommendations in the field of navigational aid signaling on the approach to the Givors bridge.

http://www.bea-tt.developpement-durable.gouv.fr/bijou-du-rhone-givors-r269.html

## 3.6 Ski lifts

#### 3.6.1 Published investigations

The ski lifts operated very little in 2020. There are no ongoing or closed surveys in the area of lifts in 2020.

#### 3.6.2 Follow-up of the implementation of the recommendations

On the basis of the monitoring carried out by the Technical Service for Guided Transport and Cableways (STRMTG), the operational implementation of the recommendations made between 2014 and 2020 following cableway accidents and having received a response is as follows

Year of publication of	Nu	Number of recommendations made and followed up						
the report	totol	С	losed					
	total	made	Not accepted	in progress				
2014	7	3	0	4				
2015	2	1	0	1				
2016	0	0	0	0				
2017	8	5	0	3				
2018	5	1	0	4				
2019	3	0	0	3				
2020	0	0	0	0				
Total 2014-2020	25	10	0	15				

## 4 Progress notes published in 2020

Depending on the nature of the accidents and when the time needed to conclude the investigation exceeds one year, the publication of notes is intended to inform stakeholders and the public of the progress of the investigations and to announce to the entities concerned the first preventive orientations.

In 2020, five progress notes were published, concerning:

- the collision between two trams causing their derailment on 11 February 2019 in Issyles-Moulineaux (92);
- the abnormal deterioration of an axle of the Europorte 60815 freight train on 26 July 2019, between Romilly-sur-Seine and Troyes (10);
- > the derailment of a Montenvers rack train on 11 August 2019 in Chamonix (74)
- the overspeed of a TGV on 22 December 2019 at La Milesse (72)
- ▶ the collision of two tramway trains on 2 December 2019 in Montpellier (34).

These notes are available on the BEA-TT website until the final reports are published.

## **5** Summary of recommendations

### 5.1 Global overview

Eleven investigations were conducted in 2020. In the 11 accidents investigated, 8 people were killed and 16 seriously injured. Three occurred at level crossings. All but one of the investigations resulted in recommendations (within the meaning of the Transport Code and requiring a response) and invitations (not requiring a response), aimed at preventing accidents with the same causes, for the attention of the actors: transporters, network operators and infrastructure managers, regulatory and normative authorities, etc.

### **5.2 Nature of the recommendations**

In concluding the 11 reports, the BEA-TT made 25 separate recommendations. Of these 25 recommendations:

Six concern level crossings:

- five recommendations on the design of level crossings to improve the legibility of signs, facilitate pedestrian movement and physically prevent the use of prohibited and dangerous routes;
- A recommendation calls for consideration of the automation of emergency braking of road vehicles when approaching level crossings at barriers.

For **collective road transport**, apart from the need to remind passenger transport operators of the obligation for passengers and drivers to wear seat belts inside coaches, the recommendations concern coach equipment:

- tires for better resistance to shocks and verification of their internal condition during rim removal operations;
- > safety glass so that the specifications include the ability to be broken.

For **guided transport**, four accidents were analyzed, with very different causes, so the recommendations cover very different topics:

- monitoring parts of infrastructure whose behavior may be altered by intense weather events;
- managing the risk of loss of a component or part of a rolling stock with the particular case of parts at the rolling stock/rail interface;
- the management of traffic lights for road crossings on tramway tracks with the synchronization of traffic lights on crossings close to each other and the taking into account of the clearance times of long heavy vehicles;
- Finally, the need to train public transport drivers in the risks associated with compressed natural gas engines and in appropriate behavior in the event of an accident.

The two recommendations concerning **inland waterway transport** relate to signage to better assist boat operators.

## 5.3 Follow-up planned by the addressees

Article R. 1621-9 of the Transport Code specifies that the addressees of the recommendations shall inform the Director of the BEA-TT, within 90 days, of the action they intend to take on them and, where applicable, the time required for their implementation. Their responses are made public like the recommendations themselves.

Of the 25 recommendations issued in 2020 :

- > 15 were accepted and their implementation confirmed, sometimes with a time limit;
- > 3 are currently being implemented;
- > 7 have not yet been answered by the addressee concerned.

Beyond the simple collection of the intentions of the addressees carried out by the BEA-TT, the control of the operational follow-up actually given to its recommendations is, de jure or de facto, taken care of by other organizations.

They shall maintain the tables in the annexes.

## SUMMARY OF ANNEXES

Annex 1:	Follow-up by the Public Railway Safety Establishment (EPSF) of the implementation of the recommendations issued by the BEA-TT in the field of rail transport
Annex 2:	Follow-up by the Public Railway Safety Establishment (EPSF) of the implementation of the recommendations issued by the BEA-TT in the field of level crossing
Annex 3:	Follow-up by the Channel Tunnel Intergovernmental Commission (IGC) to the recommendations made in the report on the fire on board a Eurotunnel freight shuttle on 17 January 2015
Annex 4:	Follow-up by the ski lift and guided transport technical department (STRMTG) of the implementation of the recommendations issued by the BEA-TT in the field of guided transport
Annex 5:	Follow-up by the ski lift and guided transport technical department (STRMTG) of the implementation of the recommendations issued by the BEA-TT in the field of lifts
Annex 6:	Follow-up by the Directorate General for Energy and Climate (DGEC) on the implementation of the recommendations issued in the field of road transport
Annex 7:	Follow-up by the Road Safety Delegation (DSR) of the implementation of the recommendations issued in the field of road transport
Annex 8:	BEA-TT organization chart and institutional texts

Annex 1: Table of the Public Railway Safety Establishment (EPSF) presenting the follow-up of the implementation of the recommendations issued by the BEA-TT in the field of rail transport

## **Recommendations issued in 2012**

Date of the report	Title of the investigation	N°	Wording of the recommendation	Entity	Status of actions monitored by EPSF at the end of 2020	Code <sup>*</sup>
01/2012	Derailment of a freight train in Neufchâteau station (88) on 22/05/2010	R2	Intervene with the European standardization bodies to have the raw fabric wheels removed from the European design and manufacturing standards for wagon wheels, pending sufficient knowledge of the influence of their surface characteristics on their fatigue resistance.	Bureau de normalisation ferroviaire (BNF)	A new version of the EN 13979-1 standard was published in July 2020 removing the notion of raw and machined fabric. The analysis of this standard is underway in order to complete this action. Action in progress	0
11/2012	Catching up of two freight trains in Maillé (37) on 01/02/2012	R1	Ensure the recording and tracking of safety communications of regulators and traffic officers from their fixed duty phones. In addition, the BEA-TT invites the railway operators operating on the national rail network to remind their drivers of the safety requirements of running on sight in terms of, in particular, vigilance and control of the speed of their train, in order to be able to stop it before any signal or obstacle.	SNCF Réseau	The deployment of recorders in the stations is still ongoing. Due to the health crisis in 2020, progress has been delayed and the planned completion date of 2025 needs to be revised. Action in progress	0

### **Recommendations issued in 2013**

Date of the report	Title of the investigation	N°	Wording of the recommendation	Entity	Status of actions monitored at the end of 2020	Code*
07/2013	Collision between a train and a construction machine at Lachapelle- Auzac (46) on 04/07/2012	R3	Ensure the recording of all operationally related communications from traffic officers' duty phones. In addition, the BEA-TT invites SNCF to conduct feedback on the use of the new LOR'AXE type catenary maintenance machines and on the training conditions for their drivers.	SNCF Réseau	As for recommendation R1 of t h e enquiry concerning the overtaking of two goods trains at Maillé (37) on 01/02/2012: The deployment of recorders in the stations is still ongoing. Due to the health crisis in 2020, progress has been delayed and the planned completion date of 2025 needs to be revised. Action in progress	0

## **Recommendations issued in 2015**

Date of the report	Title of the investigation	N°	Wording of the recommendation	Entity	Status of actions monitored by EPSF at the end of 2020	Code <sup>*</sup>
	Collision following a drift	R1	Tighten and clarify the maintenance rule aimed at searching for and eliminating couplers on the fleet of wagons for which you are the entity responsible for maintenance that do not bear the marks of conformity to the European standard or to recognized national standards.	ERMEWA	By the end of 2020, 46% of the car fleet affected by this recommendation had been treated. Action in progress	0
05/2015	Collision following a drif 5/2015 in Modane (73) on 24/01/2013	R3	As soon as the modification covered by recommendation R2 has been finalized, apply it to the overhauls of the distributors concerned on the wagons for which you are the entity responsible for maintenance.	SNCF Voyageurs Direction du matériel	Faiveley plans to supply SNCF with "-50°C" membrane prototypes in September 2020. The first type is currently being used for revision. The other type of membrane, after acceptance and inspection, will be applied from June 2021. Action in progress	0
06/2015	Drift of a TER in Mérens-les-Vals (09) on 18/12/2013	R4	Improve the braking performance of high-capacity multiple units in low grip conditions by : -rapidly lowering, to the lowest possible level compatible with the constraints on this equipment, the infrastructure and passenger comfort, the speed threshold below which the shoes of their electromagnetic brake must not be in contact with therails; -prescribing and organizing a systematic check of the operation and filling of their sandpits during all their visits to service stations.	SNCF Voyageurs	The deployment of the modifications provided for by this recommendation was the subject of two orders of modification (OM). The first, known as the "electrical OM", is related to the response to the Serqueux drift. The second concerned the speed threshold used in the operation of the magnetic skids. Action closed	С
09/2015	Derailment of an Intercity train in Bretigny-sur-Orge (91) on 12/07/2013 (Final report)	R6	Systematically include in the safety audits of institutions in charge of railway infrastructure maintenance, checks on the actual condition of a sample of equipment that has recently undergone monitoring or maintenance work in order to assess the relevance of the maintenance rules and the quality of their implementation. In this context, pay particular attention to the performance of monitoring rounds and family B checks on turnouts.	SNCF Réseau	The verification of the actual state of the installations has been permanently integrated into the internal safety audits carried out by the ASNO. The integration of this type of verification into the controls carried out by the operational management in maintenance establishments has been deployed. Action closed	с

## **Recommendations issued in 2016**

Date of the report	Title of the investigation	N°	Wording of the recommendation	Entity	Status of actions monitored by EPSF at the end of 2020	Code <sup>*</sup>
01/2016	Multiple rail break crossed at speed by trains in Carbonne (31) on 26/11/2013	R3	Study an evolution of the opposable reference system relating to the movement of trains, providing, in case of doubt about the nature of the impact felt on the train, a lighter procedure than the current procedure for reporting an abnormal impact, in particular for sections of line without continuous coverage by signaling-related track circuits.	SNCF Réseau EPSF	A working group was set up by SNCF Réseau with the participation of EPSF to study the possibilities of changing the reference system concerned. The working group's solution was not adopted by SNCF Réseau's inter-trade safety commission because of the complexity that would have been introduced. The response to this recommendation was modified by SNCF Réseau to propose the use of the VIGI-EXPRESS system. A letter was sent in 2020 to all railway companies to present the use of this tool. This subject was also placed on the agenda of the zonal feedback meetings organized by SNCF Réseau. Action closed	С
05/2016	Striking of a TER parked on the platform by an infrastructure monitoring train in Saint-Germain- des- Fossés (03) on 15/12/2014	R1	Ensure the recording and traceability of telephone exchanges between train drivers and the agents of the traffic and circulation management service whose telephone numbers appear in the technical records of the lines of the national rail network.	SNCF Réseau	As for recommendation R1 of t h e enquiry concerning the overtaking of two goods trains at Maillé (37) on 01/02/2012: The deployment of recorders in the stations is still ongoing. Due to the health crisis in 2020, progress has been delayed and the planned completion date of 2025 needs to be revised. Action in progress	0
11/2016	TER drifting after a collision with cattle in Serqueux (76) on 20/10/2015	R2	Positioning of the obstacle guard and protection of sensitive under-body components By involving the railway sector and after determining the most appropriate form for the European context: explain how to calculate and use the construction gauge of the rolling stock in order to optimize the positioning of the obstacle clearance with regard to the risk of Overlapping of an obstacle on the track; formulate the useful prescriptions for the identification of sensitive under-body components, their protection and their positioning in height in relation to the obstacle trap.	EPSF	Analysis underway with regard to the publication of new versions of the standard: rolling stock gauge (EN 15273-2) passive safety (EN 15227) Action in progress	0

## **Recommendations issued in 2016 - continued**

Date of the report	Title of the investigation	N°	Wording of the recommendation	Entity	Status of actions monitored by EPSF at the end of 2020	Code <sup>*</sup>
11/2016	Derailment of a TGV trai in Gare de Lyon in Paris (75) on 28/01/2015	R1	Strengthen the practical training and supervision of young ES staff on aspects related to the maintenance of such very special old safety installations.	SNCF Réseau	Of all the actions implemented by SNCF Réseau to respond to this recommendation, the carrying out of risk analyses at local level to detect old and special installations remained the action awaiting evidence. In 2020, the evidence provided ensured that this action was sustainable in the schools concerned Action closed	С

## Recommendations issued in 2017

Date of the report	Title of the investigation	N°	Wording of the recommendation	Entity	Status of actions monitored by EPSF at the end of 2020	Code <sup>*</sup>
	Derailment of a TER on the entrance switch rail of the Sainte-Pazanne station (44) on 12/10/2015	R1	Initiate studies or investigations to improve knowledge of wheel fouling. Without waiting, take into account this phenomenon and the possibility of dehunting on clean rail when considering the risk associated with dehunting, including on ITE track circuits, and examine the relevance of equipping X 73500s with scrubbers (or any other wheel cleaning equipment). Take into account the results of these studies in order to develop, if necessary, the standards for the approval of equipment on the national rail network and at European level, in conjunction with the European Railway Agency.	SNCF Réseau SNCF Voyageurs EPSF	Studies have been carried out in order to better understand the phenomenon of wheel fouling. They provide details on the electrical insulation characteristics. Different solutions for cleaning wheels on equipment not equipped with brake blocks have been tested, in particular on X 73500s in the Auvergne - Rhône Alpes region. The equipment on other rolling stock will be carried out according to the risk analysis carried out at local level. EPSF monitors the progress of the work carried out by SNCF Réseau and SNCF Voyageurs on a quarterly basis with a view to making changes to the SAM 004"	0
01/2017		R3	Formalize the criteria and process for granting S6A No. 4 exemptions so as to limit them to cases where they correspond to a real need for the operation of the post concerned.	SNCF Réseau	SNCF Réseau has deployed the principle of risk analyses to meet this recommendation. By the end of 2020, two-thirds of the establishments had completed these risk analyses and this stage is expected to be completed by the third quarter of 2021. The next step will be to prepare a dossier presenting the adaptation of measures based on the results of the risk analyses. Three sites are currently applying the adaptation method and a report on the lessons learned from these experiments is expected in 2021. Action in progress	0
		R4	Consider the functionalities of modern stations in order to adapt them to the real needs of the stations where they are located and thus limit their vulnerability in the event of dehunting.	SNCF Réseau	Consideration of the problem of dehunting in the design of signal boxes will be included in the specifications for the preliminary studies of the centralized network controls. Action in progress	0

<sup>\*</sup> C= Close; O = Open \*\* SAM 004: Specification for the authorisation of rolling stock, which is a normative document published by EPSF. SAM004 deals with the shuntability of rolling stock

## **Recommendations issued in 2017 - continued**

Date of the report	Title of the investigation	N°	Wording of the recommendation	Entity	Status of actions monitored by EPSF at the end of 2020	Code <sup>*</sup>
11/2017	Multiple rail breaks between the stations of Beillant and Jonzac (17) on 13/12/2016	R3	Develop and then implement a policy for the deployment of convoy fault detectors on the main freight traffic flows. This set of detectors should aim at stopping convoys with vehicles carrying dangerous wheel defects but also at identifying and reporting to the Railway Undertaking, the entity in charge of maintenance (ECM) or the keeper concerned, vehicles carrying non-critical defects but likely to degrade the infrastructure.	SNCF Réseau	SNCF Réseau undertakes to study the principles for the implementation of train anomaly detectors on the national rail network. The schedule of progress, including the necessary technical studies and risk analyses, shows a timeframe that runs until the end of 2022. Action in progress	0

## **Recommendations issued in 2018**

Date of the report	Title of the investigation	N°	Wording of the recommendation	Entity	Status of actions monitored by EPSF at the end of 2020	Code*
12/2018	Catching up with two TERs near the station in La Redonne-Ensuès (13) 18 August 2017	R3	Carry out a retroactive safety study for the Marseille - Miramas line, looking at the impacts in nominal and degraded mode, and the technical solutions or procedures that can be implemented to contain the risks.	SNCF Réseau	SNCF Réseau has decided to respond to this recommendation by testing a technical solution in order to assess its suitability for eventual deployment. In the meantime, a procedural adaptation has been undertaken in the case of penetration of an occupied area. In 2020, the adaptation of the procedures was completed and this part of the response is now closed. As regards the technical solution, the various stages still need to be specified, with no target date defined for the moment. Action in progress	0

## **Recommendations issued in 2019**

Date of the report	Title of the investigation	N°	Wording of the recommendation	Entity	Status of actions monitored by EPSF at the end of 2020	Code <sup>*</sup>
02/2019	Derailment and loss of load of a freight train transporting ethanol at the Sibelin marshalling yard in the commune of Solaize (69) on 13 March 2017	R2	Review, and if necessary reinforce, the maintenance rules on the effectiveness of rail fasteners to take account of the particular demands of guiding traffic in areas with small curves.	SNCF Réseau	SNCF Réseau has changed the rules for holding the rail in curves of less than 350 meters as part of the revision of MT0264 "Maintenance of Service Tracks". Action closed	С
04/2019		R1	Study the technical conditions under which light signals for level track crossings by the public can be equipped with means of recording their proof of operation. Define a modernization plan enabling them to be equipped with this recording in a timeframe to be specified.	SNCF Réseau	SNCF Réseau undertakes to study the technical conditions under which TVP light signals can be equipped with means of recording their proof of operation. The target date is the end of September 2021. The plan to deploy a technical solution remains without a target date and depends on the completion of the previous action. Action in progress	ο
	Pedestrian hit by a train on a pedestrian crossing at Écommoy station (72) 22 February 2018	R2	Implement the relocation of the Écommoy level crossing in order to guarantee visibility of pictograms and, to a certain extent, crossing trains for pedestrians when a train stops at a station. Identify similar situations where pictograms are obscured when a train stops throughout the network and include this criterion when prioritizing investments to improve crossings.	SNCF Réseau	The new pedestrian crossing with pictograms was put into operation in December 2020. A survey of similar situations where pictograms are obscured when a train stops was finalized in June 2020. The integration of the improvement of the masking situations of illuminated TVP pictograms into SNCF Réseau's investment programme for the improvement of crossings is planned for September 2022 once a TVP criticality matrix has been developed and implemented. Action in progress	0
		R3	Finalize tests to improve warning signs at road crossings by reinforcing the road markings indicating the danger zone, improving the ergonomics of the signs and adding a second, non-visual, mode of perception. At the end, develop a plan to roll out the improvements.	SNCF Réseau	SNCF Réseau is committed to testing and defining fixed warning signs at station crossings (panels and ground markings) with improved ergonomics. This first stage has been delayed due to the health crisis and is expected to be completed by March 2021. The deployment of the new fixed signs will be specified once they have been defined. The addition of a second, non-visual mode of perception is incorporated in its response to Recommendation 5. Action in progress	0

## **Recommendations issued in 2019 - continued**

Date of the report	Title of the investigation	N°	Wording of the recommendation	Entity	Status of actions monitored by EPSF at the end of 2020	Code <sup>*</sup>
04/2019	Pedestrian hit by a train on a pedestrian crossing at Écommoy station (72) 22 February 2018	R4	Study and deploy new awareness-raising solutions for travelers who have to cross tracks, to raise their awareness of the risks and get them to adopt real risk- prevention behavior.	SNCF Réseau	SNCF Réseau has developed a national safety campaign on railway risks in stations, including risks to PSTs. In 2021, SNCF Réseau will make the materials created available to the various railway companies transporting passengers, in order to involve them in the deployment of the campaign. Action in progress	0
				SNCF Voyageurs	In addition to the measures already taken when serving stations equipped with TVP (signs in stations, announcements on board and in stations, distribution of flyers in stations, etc.), SNCF Voyageurs will enhance the content of the presentations made during school visits. Based on the identification of risk situations in the railway environment of each school, the prevention message will be tailored to the local context to raise awareness among young people. Action in progress	
		R5	Draw lessons from the risk study carried out by SNCF Réseau on pedestrian crossings of tracks at level, by experimenting with defenses against the risk of being hit by a train in a station in the event of inattention to the light signals, for example the presentation of a physical obstacle. Once these solutions have been validated, they can be proposed in projects to make crossings safer.	SNCF Réseau	SNCF Réseau has started a research project to objectivize all the factors involved and to build a strategy for improving PSTs. SNCF Réseau undertakes to test the selected devices by the end of 2024 and to integrate them, if necessary, into the safety policy relating to the prevention of the risk of collisions in stations on PSTs. Action in progress	0

## **Recommendations issued in 2019 – continued**

Date of the report	Title of the investigation	N°	Wording of the recommendation	Entity	Status of actions monitored by EPSF at the end of 2020	
12/2019	Derailment of a TGV in Marseille Saint- Charles (13) 24/08/2018	R1	Study, for simple turnouts of small radius used by long wheelbase bogie traffic (TGV, NAT, etc.), a reinforcement of the outer rail fastening system of the deviated track, and, failing this or pending implementation, reinforce maintenance operations.	SNCF Réseau	<ul> <li>SNCF Réseau distributed feedback on the possible causes of failure due to skid injuries, with a reminder of the recommendations, and reinforced maintenance for similar cases of highly stressed 0.13 tangent branches.</li> <li>In view of the severity of the maintenance carried out on these installations and the existence of a system that meets the requirements for reinforcing the attachment system, it was not considered useful to study a new reinforcement of the attachment system.</li> <li>Action closed</li> </ul>	с
12/2019	Study Fatal trespassing accidents on the railway domain Analysis of accidents in 2015 and 2016 and prevention policies	R1	Complete the implementation of the new governance of the line-break risk within the infrastructure manager and deploy the repositories and tools for local line-break risk managers.	SNCF Réseau	SNCF Réseau has completed the implementation of the new governance of the risk of line collisions by defining a general policy, publishing an application document and leading the process via the national "Rail Risk" commission. Action closed	с
		R2	Deploy a tool for knowledge of the network's fencing assets, describing the location and condition of the devices, for monitoring by local managers of the risk of online collisions.	SNCF Réseau	SNCF Réseau is continuing to deploy and improve the quality of the GAIA tool, which is intended to ensure the inventory of all its assets and, in the long term, to store data relating to closures. Action in progress	0
		R3	Study the advisability of establishing a regulatory requirement for a physical barrier between railway rights of way and adjacent land in and around so- called urban areas as defined in the Urban Planning Code.	DGITM	As part of the feedback meetings organized specifically for infrastructure managers, an ad hoc working group will identify alternatives or supplementary measures to fences to prevent intrusion. The work of this group will be carried out within the next eighteen months and will be recorded in a report which will also include an assessment of their effectiveness from the point of view of safety in relation to the investments to be made. At the end of this work, the DGITM will study the advisability of setting a regulatory requirement. Action in progress	

## Recommendations issued in 2020

Date of the report	Title of the investigation	N°	Wording of the recommendation	Entity	Status of actions monitored by EPSF at the end of 2020	Code <sup>*</sup>
10/2020	Pedestrian hit by an TER in a station in Nouan-le-Fuzelier (41) on 03/09/2018	R1	<ul> <li>a) At Nouan-le-Fuzelier and Theillay, implement devices at the end of the quays to ensure that the planned routes for accessing or leaving the quays are respected and that they are sufficiently dissuasive to prevent non-compliance with the prohibited passages.</li> <li>(b) Study other guarded NPs located near a passenger service point on lines with a speed higher than 160 km/h and, for those presenting a risk of non-compliance with the prohibited crossings, apply the same treatment.</li> </ul>	SNCF Réseau	<ul> <li>SNCF Réseau states that it will have implemented the planned improvements b y summer 2019.</li> <li>SNCF Réseau states that it has carried out the requested study, which showed that no other passenger service point on a section of line travelling at more than 160 km/h was to be proximity to a guarded LC.</li> <li>The evidence for these two points is currently being analyzed. Action in progress</li> </ul>	0
		R2	Review the layout of the safety and directional signs in Nouan-le-Fuzelier to make them visible from the route alternatives and to discourage early use of prohibited routes.	SNCF Gare et Connexions	SNCF Réseau and Gares & Connexions have implemented this recommendation by carrying out the signage changes at the same time as the work referred to in the previous recommendation R1. The evidence submitted is currently being analyzed. Action in progress	0
		R3	Drawing concrete conclusions from the risk study on pedestrian safety at NPs implement an action plan accordingly to ensure that this risk is controlled. The BEA-TT invites SNCF Réseau to deal with the parts It has a "Reserved" section in its documentation dealing with guarded NPs.	SNCF Réseau	SNCF Réseau used the risk study referred to in the recommendation to update the policy for controlling pedestrian risks at level crossings, described in a reference document dated 28 October 2020. By the end of March 2021, SNCF Réseau will decide on the follow-up to each of the proposals in the risk study. Action in progress	0
## Annex 2: Table of the Public Railway Safety Establishment (EPSF) presenting the follow-up of the implementation of the recommendations issued by the BEA-TT in the field of level crossings

#### **Recommendations issued in 2006**

Date of the report	Title of the investigation	N°	Wording of the recommendation	Entity	Status of actions monitored by EPSF at the end of 2020	Code <sup>*</sup>
12/2006	Collision of an TER and a heavy goods vehicle on a level crossing in Saint-Laurent-Blangy (62) on 09/06/2005	R1	Continue the study of solutions (levelling in place or new route) allowing the removal of this LC, in order to reach a decision and implementation as soon as possible.	SNCF Réseau Departmental Council 62	The road bypass project allowing the removal of the level crossing listed in the national safety plan has been cancelled and no new study has been launched. For several years, this LC has been equipped with a radar system to detect unauthorized road crossings. SNCF R is continuing to study ways of making this LC safer, including with experimental video surveillance systems. Action in progress	0

#### **Recommendations issued in 2010**

Date of the report	Title of the investigation	N°	Wording of the recommendation	Entity	Status of actions monitored by EPSF at the end of 2020	Code*
09/2010	Collision between a coach and a TER at PN n°4 in Nevers (58) on 03/02/2009	R1	Evaluate and study the light control system of LC 4 (as well as LC 5) to look for simple optimization measures (duration of light cycles, possible coordination of upstream and downstream lights, delay in activation of the upstream light after detection, efficiency of the detection loop, etc.) in order to reduce the risk of encroachment on the track by a vehicle stopped at the end of the queue downstream of the level crossing	Municipality of Nevers	No information obtained following the follow-up letter from the DGITM sent in February 2019 to obtain information on the implementation of measures to respond to this recommendation. A second reminder is in progress Action in progress	0

Date of the report	Title of the investigation	N°	Wording of the recommendation	Entity	Status of actions monitored by EPSF at the end of 2020	Code <sup>*</sup>
04/2014	Collision between a TER and a mobile crane in Marseille (13) on 13/04/2013	R1	Prohibit the crossing of level crossing n° 1 of the railway line from Miramas to Marseille by the Côte Bleue to heavy vehicles coming from the rue Albert Cohen with characteristics that do not allow them to circulate easily downstream of the railway right-of-way. This prohibition should be signaled from the crossroads of the chemin du Passet and the rue Albert Cohen.	Bouches-du- Rhône prefecture City of Marseille	Signs announcing the ban from the crossroads of chemin du Passet and rue Albert Cohen have been put in place. The reply letter sent to the BEA-TT announced that consideration would be given to removing this LC. A follow-up letter from the DGITM was sent in February 2019 to obtain information on the implementation of this commitment. No further information was obtained in 2020. A second reminder is underway. Action in progress	0

#### **Recommendations issued in 2015**

Date of the report	Title of the investigation	N°	Wording of the recommendation	Entity	Status of actions monitored by EPSF at the end of 2020	Code*
06/2015	Collision between a TGV and a road tanker in Saint- Rémy-de-Sillé (72) on 15/10/2013	R1	Prevent, by any appropriate means, the access of low- slung vehicles to the communal road no. 3 or redesign the longitudinal profile of this road immediately north of the level crossing no. 128 so that these vehicles can cross it without getting stuck.	SNCF Réseau Saint- Rémy- de- Sillé municipality	Technical studies aimed at improving the road crossing conditions of the LC have been carried out but the implementation of these improvements could not be completed due to lack of funding. As a result, the first solution proposed by the recommendation was adopted and involves the installation of advanced signage and a change in the traffic permits for the road by means of a municipal by-law. Action closed	С

Date of the report	Title of the investigation	N°	Wording of the recommendation	Entity	Status of actions monitored by EPSF at the end of 2020	Code <sup>*</sup>
	Collision between a TER and a school bus in Millas (66) on 14/12/2017	R1	Establish, in coordination with SNCF Réseau and the Road Safety Delegation (DSR), a technical reference system setting out performance and a procedure for assessing the conformity of level crossing equipment, as provided for in the road regulations relating to the qualification of road equipment, as well as the rules for putting into service and installation according to their characteristics and environmental constraints	Directorate- General for Infrastructure, Transport and the Sea - DGITM	The DGITM has undertaken to set up a working group involving SNCF Réseau and the road safety delegation (DSR), which aims to take stock of the three families of equipment (flashing red lights, barriers and bells). The aim is to take stock of existing standards and define the standards to be implemented, define the desired performance thresholds, etc. The work will then enable the drafting of a decree including the performance thresholds and certificates of conformity for these three families of equipment, in accordance with Articles R. 119-4 and R. 119-7 of the French Roads Code. Action in progress	0
05/2019		R2	Investigate equipment to provide a continuous audible warning signal from the time the barriers are lowered until they are raised to all users of level crossings. In the context of the development of connected vehicles, study the feasibility of postponing level crossing closure alerts within the vehicles coupled with the GPS system and on-board mapping.	SNCF Réseau	The study on equipment to broadcast a continuous warning sound signal has been carried out. A presentation at a meeting of the national Level Crossing body is planned for the first half of 2021. With regard to the feasibility of reporting the alert of an active level crossing in a connected vehicle, SNCF Réseau undertakes to regularly inform the National Level Crossing Panel of the progress of studies, particularly at European level, in which it is participating. Action in progress	0
		R3	Study the modalities of widening the existing junctions on either side of the NP25 to facilitate turning according to the types of heavy vehicles. Failing that, take police measures to prohibit left turns towards the LC for these categories of vehicles.	Conseil départemental counci of Pyrénées- Orientales	The Department has carried out studies on the turning of the junctions on either side of PN 25, for heavy vehicles turning left towards the level cosing The directional island on the RD46 will be modified so as to shift the opening of the RD46 onto the RD612 to the south, thus creating a wider turning circle that allows heavy vehicles to position themselves perpendicular to the lowered half of the level crossing a few meters upstream of it. No information in 2020 on the progress of this action.	0

#### **Recommendations issued in 2019 - continued**

he     Title of the investigation     N°     Wording of the recommendation		Entity	Status of actions monitored by EPSF at the end of 2020	Code <sup>*</sup>	
	R4	Update and complete the provisions of the circulars on level crossing safety and their implementation documents so that safety diagnoses become more complete and high-quality risk analyses in order to make the necessary preventive actions more relevant.	Directorate- General for Infrastructure, Transport and the Sea - DGITM	A circular was published in January 2020 to ask prefects to ensure that the obligation to carry out safety diagnoses by the actors concerned is implemented and monitored. At the end of 2020, the decree and order relating to road safety diagnoses of level crossings are in the pipeline. They will introduce the obligation to carry out safety diagnoses, including the structure, as well as the procedures for carrying out and making available these diagnoses Action in progress	0
Collision between a TER and a school bus in Millas (66) on 14/12/2017		Study the feasibility of installing a front camera at the head of the train, in order to have a record of events on	SNCF Réseau	The proposal for level crossing equipment is one of the measures in the ministerial action plan to improve level crossing safety, launched on 3 May 2019. The feasibility study has been circulated and further action on the findings is now awaited. Action in progress	
	R5 accident, and for a period that can be limited to a few dozen minutes. Study the feasibility of installing video cameras on at least some level crossings to record events as trains pass by in order to improve safety.	SNCF Voyageurs	Consideration was already being given to the fitting of front cameras at the head of trains as part of the response to the technical investigation into the derailment of a TGV train at Eckwersheim on 14 November 2015. Two devices from different suppliers have been tested since the end of 2018. The aim is to equip the first trains in 2021.	0	
	Collision between a TER and a school bus in Millas (66) on 14/12/2017	Collision between a TER and a school bus in Millas (66) on 14/12/2017 R5	R4Update and complete the provisions of the circulars on level crossing safety and their implementation documents so that safety diagnoses become more complete and high-quality risk analyses in order to make the necessary preventive actions more relevant.Collision between a TER and a school bus in Millas (66) on 14/12/2017Study the feasibility of installing a front camera at the head of the train, in order to have a record of events on the infrastructure that can be used in the event of an accident, and for a period that can be limited to a few dozen minutes. Study the feasibility of installing video cameras on at least some level crossings to record events as trains pass by in order to improve safety.	Collision between a TER and a school bus in Millas (66) on 14/12/2017       Update and complete the provisions of the circulars on level crossing safety and their implementation documents so that safety diagnoses become more complete and high-quality risk analyses in order to make the necessary preventive actions more relevant.       Directorate- General for Infrastructure, Transport and the Sea - DGITM         Collision between a TER and a school bus in Millas (66) on 14/12/2017       R5       Study the feasibility of installing a front camera at the head of the train, in order to have a record of events on the infrastructure that can be used in the event of an accident, and for a period that can be limited to a few dozen minutes. Study the feasibility of installing video cameras on at least some level crossings to record events as trains pass by in order to improve safety.       SNCF Voyageurs	Collision between a TER and a school bus in NHI22017R4Lydate and complete the provisions of the circulars on high-quality risk analyses in order to make the necessary preventive actions more relevant.Directorate- General for Infrastructure, Transport and the Sea - DGITMA circular was published in January 2020 to ask prefects to ensure that the obligation to carry out safety diagnoses by the do 2020, the decree and order relating to road safety diagnoses of level crossings are in the pipeline. They will introduce the obligation to carry out safety diagnoses, including the structure, as well as the procedures for carrying out and making available sa vell as the procedures for carrying out and making available these diagnoses.Collision between a TER and a school bus in NHIIIs (66) on 14/12/2017Study the feasibility of installing a front camera at the head of the train, in order to have a record of events on the infrastructure that can be used in the event of an accident, and for a period that can be limited to a few dozen minutes. Study the feasibility of installing video cameras on at least some level crossings to record events as trains pass by in order to improve safety.SNCF VoyageursConsideration was already being given to the fitting of front cameras at the head of trains as part of the response to the technical investigation into the derailment of a TGV train at ECON to the feasibility of installing video cameras on at least some level crossings to record events as trains pass by in order to improve safety.SNCF VoyageursConsideration was already being given to the fitting of front cameras at the head of trains as part of the response to the technical investigation into the derailment of a TGV train at ECON technical investigation into the derailment of a TGV train at EC

### **Recommendations issued in 2019 - continued**

Date of the report	of the of the investigation N		Wording of the recommendation	Entity	Status of actions monitored by EPSF at the end of 2020	Code <sup>*</sup>
		R1	Install a device near level crossing no. 8, located on the Chemin de la Libération in Bonneville-sur- Touques, prohibiting access to the crossing by persons other than those entitled to do so.	Bonneville sur Touques municipality	As of 31/12/2020, the solution initially envisaged to respond to this recommendation, consisting of removing LC 8 and transferring it to LC 7, has been abandoned in favour of automating the two level crossings. No date has been set for the validation and programming process of this work. Action in progress	0
07/2019	Collision between a TER and a car at Bonneville-sur- Touques LC 8 (14) 02/11/2017	R2	Carry out a study of the risks of level crossings on lines travelling at 140 km/h, taking into account the seriousness of the consequences of a collision on the railway vehicle, in addition to the concept of the time of travel of these level crossings. Present this study to a forthcoming National Level Crossing Forum, in order to develop, if necessary, the action plan concerning the automation of level crossings.	SNCF Réseau	The risk study on level crossings at St André crossed by trains at 140 km/h has been carried out. The presentation, informing all participating stakeholders, to the National Level Crossing Forum in April 2020 has been cancelled due to the health crisis and is now scheduled for 2021. Action closed	с

Date of the report	e Title of the investigation N° Wording of the recommendation		Entity	Status of actions monitored by EPSF at the end of 2020	Code <sup>*</sup>	
05/2020		R1	Study the improvement of the legibility of LC 302 from the northern approach, in particular by acting on the vertical signs and vegetation.	Saint-Etienne Métropole	Awaiting reply	ο
	Collision between a TER and a light vehicle on the PN n°302 in Saint- Étienne (42) on 07/05/2019	R2	Investigate the possibilities of changing the lane allocation in the north-south direction, or even changing the entry flows on LC 302, for example by creating a right turn lane. Examine the feasibility of assigning a right-turn light for users travelling on the boulevard and approaching NP302 from the north. This light would remain red when the LC is closed.	Saint-Etienne Métropole	Awaiting reply	0
		R3	Study the removal of advertising elements on the rights-of-way that may contribute to the distraction of road users approaching LC 302. Eliminate interference between directional signage and warning or police signage, retaining only the most essential elements for safety.	Saint-Etienne Métropole	Awaiting reply	0

## Annex 3: Follow-up by the Channel Tunnel Intergovernmental Commission to the recommendations made in the report on the fire on board a Eurotunnel freight shuttle on 17 January 2015

N°	Wording of the BEA-TT recommendation	Entity	Status of actions monitored by the IGC at the end of 2020	Code <sup>*</sup>
R1	<b>Dealing with the risks associated with objects of unusual height</b> To make arrangements that are both fit for purpose and sufficiently reliable to reduce the risks associated with catenary strikes on objects of unusual height, such as parts of a truck or its load. This can be achieved by reinstalling the pagodas, installing a different roof design after validation, implementing an improved detection system with associated procedures or an alternative solution.	Eurotunnel	The IGC has confirmed that it has no objection to Eurotunnel's proposal to reinstall four pagodas on each of its Arbel and WBN wagons. Together with the additional protective measures, this solution is at the top of the hierarchy of prevention measures. Due to the Covid-19 pandemic, and a technical improvement to the initial proposal, Eurotunnel has informed the Channel Tunnel Safety Committee that the completion of this project is postponed to the end of 2021. The Safety Committee will continue to monitor the implementation of the project.	0
R2	<b>Continuous monitoring of improvements in fire detection systems</b> Conclude the ongoing consultation with the various manufacturers seeking innovative systems to detect any outbreak of fire more quickly and reliably, including when it is still confined to the cab of the vehicle concerned. Where appropriate, draw up a programme for implementing the new systems thus identified. Establish a permanent technical monitoring system to detect any progress in the speed and reliability of fire detection.	Eurotunnel	The Safety Committee continues to have reservations about Eurotunnel's approach to these projects. While Eurotunnel has provided further details of the proposed solutions a t regular workshops, the overall safety record of the projects is not complete. Until the proposed systems have passed final testing, there is no clear indication that a fire will be detected early in an HGV shuttle. It is also unclear how the two projects (fire detection on board HGV shuttles and fire detection in railway tunnels) are linked.	ο
R4	Improvement of the process of change management Eurotunnel should review its change management process and implementation to understand the causes of the deficiencies identified in this study in the areas of hazard identification, risk assessment, provision of necessary mitigating measures and lessons learnt from experience. As part of this review, Eurotunnel should consider, in particular, whether its system of internal control of safety studies is sufficient. Eurotunnel needs to improve its procedures to ensure that significant hazards are properly identified, that operational risks are accurately assessed and that the necessary mitigating measures are properly identified and implemented.	Eurotunnel	While the Safety Committee is satisfied with the work undertaken by Eurotunnel to address and implement the recommendations of the Frazer-Nash report, the recent review of Eurotunnel's application for safety approval has highlighted a number of issues relating to the management of developments which necessitate a further inspection prior to closing this recommendation.	0
R5	Review arrangements to ensure that the scope and coverage of all audits by external bodies commissioned by Eurotunnel are clearly defined and implement any necessary changes.	Eurotunnel	The IGC echoes the view of the Safety Committee that Eurotunnel needs to rework SAFD 0080 to set out its own expectations of its external contractors and the checks that need to be carried out to ensure that they have performed adequately. Eurotunnel should clearly define the framework and scope of these checks in its development management procedure.	0

## Annex 4: Table of the Technical Service for Cable Cars and Guided Transport (STRMTG) presenting the follow-up of the implementation of the BEA-TT recommendations in the field of guided transport

**Recommendations issued in 2015** 

Completed recommendation	R	

Amended recommendation RM Recommendation in progress EC

- Recommendation in progress EC Rejected recommendation NR
  - Unknown outcome NC

Investigation title	N° Bacammon	Recommendation wording	Recipient(s	Date of	Follow-up and status (literal & codified)	
investigation title	dation	Recommendation wording	)	e	literal	Coding
Child falls under a tram on 28 April 2013 at the "René Cassin" station in Nantes (44)	R1	Complete the means and operational procedures for triggering and handling alerts in order to guarantee, as soon as an accident is suspected, a rapid stop of the tramway trains concerned. To this end, equip the stations of the Nantes tramway network with simple devices enabling any witness to an accident to inform the central control station without delay.	SEMITAN		posting an emergency number on all tram stations and developing a procedure at the PCC for handling calls	

Completed recommendation R

Amended recommendation RM

Recommendation in progress EC

Rejected recommendation NR

Unknown outcome NC

Investigation title	N°	Recommendation wording	Recipient(s)	Date of	Follow-up and status (literal & codified)	
	Reco	Recommendation wording	neoipieni(3)	response	literal	Coding
	R1	Require tram operators to ensure that the driver has sufficient time, and in any case more than two seconds, between the moment when an alarm indicating a failure to activate his standby device is triggered and the moment when the corresponding emergency braking is applied.	STRMTG	05/07/16	This measure aims to reduce the occurrence of untimely FU watches unrelated to a driver's potential discomfort. The STRMTG will initiate a reflection in conjunction with the operators and the Transport Organizing Authorities to determine the conditions for implementing this recommendation. For future rolling stock, the technical guide "Tramway watch function - Safety requirements" currently being drawn up by the STRMTG will take this recommendation into account. Technical guide "Tramway watch function" published on 10/02/2017	R
Fatal fall of a passenger in a tram while braking emergency 3 September 2012 in Montpellier (34)	R2	Check that EN 13452 is specified in the safety files of future tramway trains. In particular, ensure that the design of the emergency braking system allows for different performance depending on whether it is triggered by the driver or by the standby device.	STRMTG	05/07/16	Designing emergency braking with different performance depending on whether it is triggered by the driver or by the standby FU is a measure that tends to reduce the severity of events associated with standby emergency braking activation. The STRMTG has therefore already started this work with the rolling stock manufacturers and the latest generations of rolling stock already have different braking performances depending on whether it is triggered by the driver or by the FU Watch. These elements will also be specified in the above-mentioned guide. Technical guide "Tramway watch function" published on 10/02/2017	R
	R3	Examine, in conjunction with the operators and the STRMTG, to what extent the instantaneous deceleration and jerk of existing trains can be reduced under acceptable technical and economic conditions when braking. The emergency stop is triggered by the monitoring system or by technical safety devices that are not related to a proven and imminent danger outside the train.	ALSTOM			
Train derailment on the Nice - Digne-les-Bains line which occurred as a result of a falling rock 8 February 2014 in Saint- Benoît	R1	Define a common system for monitoring rocky slopes overhanging railway or road rights-of-way in areas at risk of rock falls, in order to detect the early signs of destabilization of rock masses and to check the good condition of the protective devices. Specify the criteria for triggering exceptional rounds and the measures to be taken if an anomaly is detected.	PACA Region, Direction Interdéparteme nt ale des Routes Méditerranée	2016	"The RRT PACA has already concluded an agreement with the Alpes-Maritimes General Council which defines a common alert procedure for the road and rail networks in the event of a block fall or landslide. This agreement has been incorporated into the safety regulations of the Chemins de Fer de Provence in the form of a local directive DL-INF n°2. RRT PACA is currently working with the DIRMED to establish an identical procedure for the risk areas identified in the Alpes de Haute-Provence department. Field monitoring and risk studies have led to the construction of protective structures against falling rocks. These works have been financed under contractual investment programmes (in particular CPER and PDMI). STRMTG opinion delivered on 28/10/15 on the pre-report ; 23 June 2016: the STRMTG relaunches the study for the elaboration of a forecasting tool for a more rational consideration in railway operations of the variable data of natural hazards. The CEREMA will take care of the natural hazard part, and the working group composed of the STRMTG and the operators will propose associated operating measures. Contact is being made with IRSTEA and SNCF. The study is still ongoing in early 2018. Céréma must complete the inventory phase on the two networks before proposing alert thresholds according to climatic hazards.	EC

#### **Recommendations issued in 2016 – continued**

Completed recommendation R

Amended recommendation RM

Recommendation in progress EC



Unknown outcome NC

Investigation title	N° Bocommond	Recommendation wording	Recipient(s	Date of	Follow-up and status (literal & codified)		
Investigation title	ation	Recommendation wording	)	response	literal	Coding	
	R1	Ask operators of VAL automatic metros with steeply sloping track sections, either in the open air or at tunnel entrances, to counter- stripe their running tracks by orienting the arcs of the striations in the opposite direction to the slope, in order to improve water drainage.	STRMTG	23/12/2016 30/01/2017	13-14/12/16: GT Inter-VAL: exchanges with the profession on the content of a STRMTG recommendation 30/01/17: publication of a recommendation from STRMTG headquarters 15/06/17: deadline for responses from operators 15/10/17: effective date when the notices were issued to the operators after analysis of their replies. Points still being followed up by the inspection offices in connection with the notices issued	R	
	R2	Ensure that operators of VAL automatic metros have an efficient procedure for monitoring the state of fouling of running tracks and effective tools for cleaning when criteria, such as the clogging of grooves, are met.	STRMTG	23/12/2016 30/01/2017	It should be noted that recommendation R3 was the subject of a remark to all operators in the STRMTG notices issued: "I would ask you, however, pending the availability of a tool to measure runway skid resistance on a continuous basis [R4], to include in the annual report a follow-up of the skid resistance level using the means currently available, specifying the operational procedure used,"	R	
The collision of two metro trains on 18 June 2013 in Toulouse (31)	R3	Ask the operators of VAL automatic metros to check and, if necessary, restore the adhesion of the running tracks on their network.	STRMTG	23/12/2016 30/01/2017	This remark links recommendation R3 (STRMTG) to recommendation R4 (Siemens). As progress on recommendation R4 on the development of the tool is difficult at present (Siemens is waiting for all the networks to join the approach (a priori for financial reasons)) and the STRMTG does not have any levers for action at present, it is feared that in the long term the action taken on recommendations R3 and R4 will not be what was hoped for. Overall, the subject of adhesion is regularly and consistently addressed by the Inter-VAL WG, which brings together the entire profession.	R	
	R4	Develop, in conjunction with the operators of the VAL automatic metro networks and the STRMTG, an effective means of measuring the adherence of the running tracks. Develop the corresponding operational instructions allowing corrective actions to be taken when these tracks no longer guarantee a sufficient grip, even in adverse weather conditions.	Siemens	10/10/16	STRMTG recommendation of 24/02/2021 communicated to VAL operators and AOTs: Requires operators to submit a methodological note to demonstrate adhesion control	EC	

Completed recommendation R Amended recommendation RM Recommendation in progress EC



Unknown outcome NC

Investigation title	No Reco	Recommendation wording	Recipient(s)	Date of	Follow-up and status (literal & codified)	
investigation the	10.1000	Recommendation working	neoipieni(s)	response	literal	Coding
Derailment and dislocation of a train	R1	Reinforce the safety of operations at the PCC by writing an operating instruction clearly defining the safety organization of traffic in nominal mode and in degraded mode (faults).	Transvilles			
in Valenciennes on 11 April 2014	R2	Describe the organization of maintenance equipment traffic outside the framework of a controlled traffic of the PCC, and the measures to be taken to return to the nominal situation.	Transvilles			
Collision between a tram and a car	R1	Rapidly complete the programmes for the treatment of fixed obstacles likely to aggravate the consequences of collisions between trams and road vehicles and, in the meantime, take simple and temporary preventive measures for the most critical ones.	AOM of the 11 tramway networks commissioned before 2003			
in Saint-Denis (93)	R2	Review the internal process of feedback from accidents on tramway lines in operation, in order to improve the collection of information, the analysis of different levels, the definition and follow-up of corrective measures.	RATP			

#### **Recommendations issued in 2017 - continued**

Completed recommendation R

Amended recommendation RM

Recommendation in progress EC

Rejected recommendation NR

Unknown outcome NC

Investigation title	No.	Recommendation wording	Recipient(	Date of	Follow-up and status (literal & codified)	
investigation the	Reco	Recommendation working	s)	response	literal	Coding
Collision between a tram and a car on 21 December 2013 in Saint-Denis (93)	R3	Ask the mobility authorities in charge of tramway lines and their operators to formalize their relations with road managers and traffic police authorities so that feedback on accidents and incidents can be taken into account effectively.	STRMTG, UTP, GART	25/09/2017 11/01/2019 (information on the closure of the actions undertaken by the STRMTG)	Decre n°2017-440 of 30 March 2017 on the safety of guided public transport (STPG decree) provides for the formalization of exchanges between AOTs, operators and road managers in the context of feedback on accidents and incidents through the provisions of the following three articles: Article 81 - "The transport organizing authority, the operator, the infrastructure manager, the lead partner and the road manager shall ensure, each as far as they are concerned, that the level of safety with regard to users, operating staff and third parties is maintained throughout the period of operation. Art. 89 Any serious accident or incident affecting the safety of the operation of a public guided transport system shall be brought to the attention of the prefect, the transport organizing authority, the leader and the land transport accident investigation bureau without delay by the operator or infrastructure manager. This information shall include the course of the accident or incident and its seriousness. Within two months of the occurrence or discovery of the serious accident or incident, the operator or leader shall send a detailed report on this event to the prefect and the transport organizing authority. The report analyses the causes and consequences of this event, the potential risks and indicates the lessons learned and the measures taken to avoid its recurrence. All the entities referred to in Article 81 shall provide the information needed to analyze the circumstances of the accident or serious incident. a section relating to accidentology, a section relating to a single action plan envisaged to maintain and improve the safety of the system. The entities mentioned in article 81 contribute to the drafting of these parts, each insofar as it is concerned. The transport organizing authority shall send this report to the competent prefect, together with its option on the action plan it contains. The STRMTG will of course ensure that these provisions are properly implemented, particularly in the context of the pr	EC

#### **Recommendations issued in 2017 - continued**

Completed recommendation R

Amended recommendation RM

Recommendation in progress EC

Rejected recommendation NR

Unknown outcome NC

Investigation title	N°	Recommendation wording	Recipient(s)	Date of	of Follow-up and status (literal & codified)				
	Reco			response	literal	Coding			
Collision between a tram and a car on 21 December 2013 in Saint-Denis (93)	R4	Implement, in the application order and technical guides, the new provisions set out in Decree No. 2017-440 of 30 March 2017 on the safety of guided public transport, ensuring that they are operational: -verification of the implementation of corrective actions; -the systematic involvement of road managers and traffic police authorities; -binding measures in case of delay, lack of involvement or failure of actors in the process. Review their effectiveness when sufficient time has passed.		25/09/17	<ul> <li>With regard to the verification of the implementation of corrective actions, the STRMTG, through the intermediary of the control offices, ensures continuous proximity control of the networks in operational monitoring meetings</li> <li>These meetings enable permanent contact to be maintained with the operators and AOTs, establishing a relationship of trust and being informed in good time of any developments on the networks. The monitoring of the requirements of the safety files and corrective actions following events are discussed and traced thanks to monitoring tables.</li> <li>operational control audits</li> <li>They are effective tools to ensure that operators implement their safety and operating regulations and are organized to maintain the safety level of the systems they operate.</li> <li>They are, firstly, useful for the operator, the AOT and the road managers to identify areas for improvement in safety. Henceforth, the involvement of road managers will enable the STRMTG to intervene with an actor over whom it had no regulatory leverage until now.</li> <li>monitoring "as we go along".</li> <li>In addition to the items mentioned above, there is also the monitoring carried out by the inspection offices "as they go along" via operating urban guided transport networks set up by the STRMTG are likely to verify the implementation of corrective action following accidents or incidents and respond to the first point of your recommendation. On this subject, care should be taken to ensure that the active intervention of the same comments as those made earlier for recommendation R3.</li> <li>With regard to binding measures in the event of delay, lack of involvement or failure of actors in the process, Article 85 of the STPG decree states that the Prefect may ask the operator, the infrastructure manager, the lead partner or its operating measures (a provision that is already in force in STPG decree No 2003-425).</li> <li>In addition, a new provision allows the Prefect to ask the operator, the infrastructure m</li></ul>	EC			

Completed recommendation R

Amended recommendation RM

Recommendation in progress EC

Unknown outcome NC Outcome not monitored by STRMTG NS

Investigation title	N° Reco	Recommendation wording	Recipient(s)	Date of	Follow-up and status (literal & codified)		
·····galleri alle				response	Literal	Coding	
Technical investigation into the derailment of a tram on the T2 tramway line in Lyon (69) following its collision with a light vehicle	R1	For ranges that are not yet developed, in the application of the technical guide "Design of tramway front ends", do not validate a reference material with unfavorable feedback, such as the CITADIS X02 range. If the manufacturer cannot reasonably propose another reference material, require a significant improvement in the derailment rate compared to the reference or compensatory measures that significantly reduce the importance of a derailment.	STRMTG	18/10/18	The STRMTG will implement the recommendation of the BEA TT concerning the tramway lines that are not yet developed. However, the STRMTG considers that compensatory measures are interesting for existing tramway ranges but are not sufficient for ranges to be developed. It will therefore be necessary to require each manufacturer to propose a tram that is less sensitive to derailment if it presents a reference with unfavorable feedback, such as the X02 range. However, it will be necessary to specify the criteria for qualifying a significant improvement in the derailment rate. The STRMTG has no further comments on the R2 recommendation to Alstom. Concerning recommendation R3 addressed to Keolis Lyon, SYTRAL, SEMITAG and SMTC Grenoble, the STRMTG is fully in favor of imposing a speed limit for crossing junctions, a measure which is currently applied by almost all tramway networks in France.		
23 August 2015	R2	Propose solutions for significant improvements in derailment in the ranges after CITADIS X05 compared with CITADIS X02. Failing that, propose compensatory measures to reduce the importance of a derailment. These measures could also be presented as retrofits to the current ranges	ALSTOM		To be seen after the X05 range, a range not launched by Alstom		
	R3	Impose a speed limit for trams crossing junctions adapted to the danger and visibility, generally between 30 and 40 km/h. Make it clear in driving instructions and training how drivers should approach and pass-through intersections to avoid the risk of collision.	Kéolis Lyon, SYTRAL, SEMITAG and SMTC		Approach validated with SYTRAL, BSE, KEOLIS Lyon and DTMR	RM	

Completed recommendation R Amended recommendation RM Recommendation in progress EC Rejected recommendation NR Unknown outcome NC Outcome not monitored by STRMTG NS

Investigation title	N° Reco	Recommendation wording	Recipient(s)	Date of	Follow-up and status (literal & codified)		
U			,	response	literal	Coding	
Derailment of a metro train in motion on line 2	R1	Submit to the French standardization committee UC9XB "Electrical railway applications - On-board electromechanical equipment", which monitors the European and international work concerned, a request to the IEC/TC 9 "Electrical railway equipment and systems" committee of the International Electrotechnical Commission to extend the scope and requirements of the IEC 61373 standard, which has been adopted in France as NF EN 61373, to include self-induced vibrations.	BNF				
which occurred on 2/12/2016 at the Barbès- Rochechouart station in Paris (75)	R2	Following the example of air transport practices, study a change in regulations aimed in particular at making it compulsory: the exchange of information between the owner, manufacturer, operator and maintainer of passenger rolling stock, and even the infrastructure manager, when one of them identifies a safety risk from the rolling stock; the provision of a solution by the manufacturer.	DGITM				
	R3	Improve the organization of the campaigns to check and control the components of the rolling stock in order to guarantee their exhaustiveness.	RATP				

Completed recommendation R Amended recommendation RM Recommendation in progress EC Rejected recommendation NR Unknown outcome NC Outcome not monitored by STRMTG NS

Investigation title	N° Reco	Recommendation wording	Recipient(s)	Date of	Follow-up and status (literal & codified)		
				response	literal	coding	
Technical investigation into	R1	Finalize the hydrological and hydraulic risk study and initiate an action plan to reduce high-risk situations.					
the derailment of a RER B on 12 June 2018 in Saint-Rémy-lès- Chevreuse (78)	R2	Define the preventive interventions to be carried out in terms of infrastructure visits and their triggering criteria in relation to the Météo-France warning messages, by particularly in relation to areas identified as being at risk following the recommendation R1 and not yet treated.	RATP				
	R1	Study the feasibility of synchronizing traffic lights traffic at junctions 38 and 39, requiring the passage of at the red traffic lights at junction 38, the passage or keeping the traffic lights at junction 39 red for the traffic flows towards junction 38.					
Technical investigation into	R2	Revisit the clearance times of the safety matrix of junction 38 based on more representative road vehicle speed assumptions and taking into account the presence of long vehicles, and modify if necessary, the timeframes in the current matrix.	ADP				
the collision between a T7 tram and a bus on 27 February 2019 in Paray- Vieille-Poste (91)	R3	For each of the junctions on the T7 line where the maximum speed limit for road vehicles is 30 km/h or less, or where the road traffic includes a significant number of long vehicles, have the entity the owner of the light controller to a check of the relevance of the decommitment times entered in the matrix safety, taking into account these specificities.	IDFM & RATP				
	R4	Encourage their members to provide vehicle drivers with compressed natural gas-powered public transport training on the specific risks associated with this type of engine, and how to behave in the event of a event or traffic accident.	UTP & GART			NS	

## Recommendations issued in 2020 - continued

Completed recommendation R Amended recommendation RM Recommendation in progress EC Rejected recommendation NR Unknown outcome NC

Investigation title	N° Reco	Recommendation wording	Recipient(s)	Answered (Y/N) Date	Follow-up and status (literal & codified)		
				answered	literal	coding	
Technical investigation into the collision	R1	Extend, on isolated pedestrian crossings without light signals, the 25 km/h speed limit for trams in the presence of pedestrians to the presence of a fixed mask or a vehicle temporarily parking that limits visibility. Carry out awareness-raising and enforcement actions for drivers on the application of such an instruction.	Kéolis Bordeaux Métropole				
on the quai des Chartrons in Bordeaux (33) 22 February 2019	R2	Establish, in coordination with the Directorate-General for Transport and Maritime Infrastructure (DGITM) and the profession, an instruction standardizing fixed horizontal and/or vertical signs for pedestrian crossings of tramway exclusive right-of-way, announcing the danger to users and indicating that they do not have priority.	DSR	O (23/12/2020)	WG launched in December 2020 (3 meetings held, next meeting 21/09/2021). Study concerning the signaling of pedestrian crossings of tramway platforms launched by STRMTG/CEREMA (cch validated by DSR by email of 11/03/2020)	EC	
Technical investigation on the derailment of a metro train on 21 December 2018 in Marseille (13)	R1	Encourage metro project developers, and through them rolling stock manufacturers and suppliers of track components, to deal with the risk of loss of a component likely to cause a derailment in the preliminary analysis of the hazards and to include the identification of the components potentially concerned and the appropriate design and maintenance measures. Ensure that special attention is paid to this risk when examining the regulatory files for new metro projects. In particular, request the provision of a study of the static and dynamic interfaces between the track and the negative or ground friction for any new rolling stock and/or new rubber- tired metro track equipment.	STRMTG	O (21/12/2020)	<ul> <li>Development of the documentation of its quality system to include a point of vigilance for the instruction of safety files, in order to raise awareness among project leaders (metro) and to check that the problem of the loss of objects under the cash desk is taken into account</li> <li>Pending integration into the Quality documents, communication to the offices in the form of a generic response</li> </ul>	EC R	
	R2	Identify all the components of the rolling stock of the Marseille metro that could present a risk of derailment following the fall of these components onto the track and deal with the risk.	GTR	O (3/12/2020)	Comprehensive' analyses carried out Enhanced controls	EC	
	R3	Agree and finalize track and rolling stock maintenance procedures to satisfactorily deal with the risks associated with the interface between the track and the negative or ground friction of the rolling stock.	RTM / Vossloh	O (3/12/2020)	recommendations made by Vossloh Enhanced monitoring	EC	

## Annex 5: Table of the Technical Service for Cable Cars and Guided Transport (STRMTG) presenting the follow-up of the implementation of the recommendations in the field of cable cars

#### **Recommendations issued in 2015**

Completed recommendation R

Amended recommendation RM

Recommendation in progress EC

Rejected recommendation NR

Unknown outcome NC

N° Investigation title Recommen R dation		Desiniant(s)	Date of	Follow-up and status (literal & codified)			
investigation title	dation	Recommendation wording	Recipient(s)	response	literal	Coding	
Derailment of a train	R1	Carry out a complete study of the risks associated with the accidental slope of the various cogwheel railways of the "Panoramique des Dômes" and implement, if justified, the appropriate measures to limit the consequences.	TC Dome		The feedback from the derailment was taken into account by the operator and it was decided to install a monitoring system called Active and Automatic Surveillance (AAS) in the crossing area. This device forces the driver to limit his speed in the crossing area and to check the position of the switches before crossing them by the heel.	R	
on the "Panoramique des Dômes" rack railway on 28 October 2012 in Orcines (63)	R2	Amend the legislation in order to extend the application of the regulations relating to guided transport systems to cogwheel trains located in mountain areas instead of those relating to ski lifts. At the very least, if such a legislative amendment is not made, the conditions of approval for project managers called upon, in application of Article R. 342-4 of the Tourism Code, to work on rack railways should be strengthened to ensure that they have in-depth knowledge and experience of railway-type technologies and operating methods.	DGITM		A draft decree <i>is currently being studied and</i> provides for the creation of a category dedicated to rack railways in the approval of mechanical lift contractors, which will make it possible to take greater account of the specific features of these installations. A guide "Design and operation of rack trains" was published on 21/12/2016, it provides elements on the design of rack trains and essential requirements on operation.	EC	

Completed recommendation R

Amended recommendation RM

Recommendation in progress EC

Rejected recommendation NR

Unknown outcome NC

Investigation title	N°	Recommendation wording	Recipient(	Date of	Follow-up and status (literal & codified)				
F	Reco		s)	se	literal	Coding			
	R1	Specify the concrete measures to be taken when the high wind alarm is triggered and state unambiguously those to be taken when the wind speed reaches the maximum foreseen in the design of the installation, i.e. 20 m/s. Plan what to do if one or more anemometers are unavailable. Provide for traceability and recording rules to monitor the correct application of these measures.	SEVABEL	02/10/17	See SEVABEL letter of 2/10/2017: General operating procedure updated to specify the instructions in the event of unfavourable wind conditions and unavailability of a wind speed measurement.	R			
The fall of a seat from the "Les Granges" chairlift in the Les Ménuires ski area in Saint-Martin de Belleville (73) 4 April 2016	R2	Specify the regulatory requirements for wind speed measurement and alarm devices, including the following: the determination of the number and positioning of the anemometers, which should be based on prior consideration of the aerological characteristics of the site and the visibility of the line from the control center; recording of anemometric measurements; the ergonomics of the display and alarms in relation to the driver's tasks; the materialization of the maximum wind speed in operation by a specific alarm or by an automatic shutdown device.	STRMTG	02/10/17	Organization of a meeting with the profession on 19/09/2017 which allowed the overall strategy to be defined. A working group was then set up and met five times in 2018 and 2019: clarify French regulations on the location and use of anemometers for new aircraft, identify possible measures to be taken on the park in service. The following conclusions result from this work: Concerning the determination of the number and positioning of anemometers, the requirement via draft paragraph A5-5.1.1 of the RM2 guide for a specific note detailing the analysis of anemometric conditions at the site of the new installation and justifying the numbers, positions and types of anemometers to be installed was retained. This specific analysis is to be established by crossing: the source of the data: teedback from the operator, wind data available from weather stations or anemometers, etc; the different zones of the device according to their exposure to the wind, the orientations of the prevailing winds, the existence of venturi effects, the existence of particular zones masking or aggravating the effect of the wind (forest, particular relief); the determination of the areas visible from the permanent workplaces of the installation (and stations); the exposure of the different areas to frost. Concerning the recording of wind data and the corresponding operating conditions, it was decided that they should be kept for a minimum period of one week, which is considered sufficient to allow them to be used either in the case of a particular event (accident for example) or as part of the internal control carried out by the operator. The same article as above formalizes this requirement. Regarding the alarm or shutdown functions related to wind measurement, the draft paragraph A5-5.1.1 of the RM2 guide provides the following rules: It is necessary to define, for each anemometer, the wind thresholds, which may vary according to the wind direction, depending on the design of each device and in particular the templates available. The first	R			

#### Recommendations issued in 2017 – continued

Completed recommendation R

Amended recommendation RM

Recommendation in progress EC

Rejected recommendation NR

Unknown outcome NC

Investigation title	N° Reco	Recommendation wording	Recipient(	Date of	Follow-up and status (literal & codified)	
inteeligation the			s)	response	literal	Coding
	R3	In conjunction with the manufacturer, Leitner, set up a training course on the operation, adjustment and checking of the bubble actuators on chairlifts. Make participation in this course a condition for the assignment of any agent to the maintenance of these devices. Organize a line check to ensure that the maintenance procedures laid down by the manufacturer and the special instructions decided by the operator are correctly applied.	SEVABEL	02/10/17	The SEVABEL letter of 2/10/2017 announced the implementation of a training before the 2017/2018 season. During the inspection on 5/4/2018, the operator informed the STRMTG/BS that this training would be postponed until spring. The operator shall provide the STRMTG/BS with the corresponding training certificate. SEVABEL has also announced that it is introducing a check on the correct application of maintenance procedures by the sector managers at the start and end of vehicle maintenance. Finally, LEITNER has produced the manual ST 881 028 30 4 ind B for the use and maintenance of the SA4H-SA6H-CD6H bubble actuators	EC
The fall of a seat on the chairlift "LesGranges" in the Les Ménuires ski area in Saint- Martin de Belleville (73) 4 April 2016	R4	Develop the RM2 technical guide and contribute to the development of the European standard NF EN 12929-1, in order to better prevent the risk linked to the swaying of seats under the effect of wind, in particular: - for the calculation of the clearance gauge, provide for the prior determination, by calculation or by tests, of the maximum amplitude of the longitudinal oscillations taking into account the characteristics of the seat and the wind speed allowed in operation; - When calculating the clearance gauge, take into account the superposition of longitudinal and transverse oscillations; - in particular cases where the clearance gauge calculated with the new rules cannot be completely cleared, provide devices to limit the risk of snagging.	STRMTG	02/10/17	Organization of a meeting with the profession on 19/09/2017, which enabled the definition of an overall strategy.         A working group was set up and met five times in 2018 and 2019. Its work focused in particular on the following areas, which are complementary to those mentioned for recommendation R2:         - develop new rules for the consideration of longitudinal oscillation gauges for new aircraft;         - study different hypotheses of combinations of longitudinal/transverse oscillations, their impact, and then assess on this basis the opportunity to modify the rules;         The following decisions resulted from this work:         - Permissible wind pressure in operation ≤ 250 Pas         0.34 radfitatoscillation (currentrule = European rule)         - Permissible wind pressure d standard oscillation + 0.1 rad margin (with a minimum of 0.34 rad)         For chairlifts with bubble seats, regardless of the expected wind speed in operation, case b) is to be considered, taking into account the relative speed of the rope movement.         These new rules were partially applied to bubble chairlifts built in 2017 and 2018, and fully applied to these devices from 2019.         For other aircraft, they have been partially applied for aircraft built from 2019 onwards and will be fully applied for projects authorized from 2020 onwards.         In parallel, the STRMTG launched a compliance campaign targeting the fleet in service:         - bubble chairlifts (recommendation 18/07/2019) :         - Verification that the calculated doscillations under the maximum operating wind, taking into account the relative wind of the cable displacement, do not ex	EC

#### **Recommendations issued in 2017 - continued**

Completed recommendation R

Amended recommendation RM

Recommendation in progress EC

Rejected recommendation NR

Unknown outcome NC

Investigation title	N° Reco	o Recommendation wording R	Recipient(	Date of	Follow-up and status (literal & codified)		
		5	s)	response	Literal	Coding	
Falling from a chairlift seat "Les Granges" in the Les Ménuires ski area in Saint-Martin de Belleville (73) on 4 April 2016	R5	Amend the technical documentation attached to the EC Declaration of Conformity for the SA6H seat to specify the maximum amplitudes of oscillation corresponding to its field of use.	LEITNER	?	The seat model originally fitted to the TSD des Granges is an old model, known as the "SA6H vehicle", and whose EC conformity was established by the STRMTG-ON, formalized by EC examination certificate no. 10, referring to technical documentation DD 00078. It is this latter documentation that is the subject of Recommendation R5. This seat model no longer corresponds to the manufacturer's standard for new equipment and is therefore only used in the context of after-sales service or modifications to existing equipment. Taking advantage of an increase in throughput by adding seats on the Grenchen TSD at the end of 2017, LEITNER reworked its technical documentation in 2017 in conjunction with STRMTG-ON. For the time being, considering the need to develop the indications on the gauges (taking into account the BEA-TT recommendation) and these being largely interfaced with the adjustment of the line gangways, the manufacturer has chosen to create a new vehicle subsystem, dedicated to the Granges TSD. This sub-system has been granted the EC certificate of conformity n°578, which itself refers to the technical documentation D10216262. While the design of this new subsystem is very similar to that of the old one, the technical documentation has evolved considerably to specify the oscillations achieved under different wind values. Some of the data used to calculate the gauges, in particular the shape coefficient Cx, is taken from the user file of the seat integrated in this subsystem. This seat and its EC documentation have been assessed by a Notified Body other than STRMTG-ON. The wind pressure data (300 Pa, i.e. a pressure compatible with a wind limit of 20 m/s, increased by the relative speed of displacement to 5 m/s) and the gauges mentioned in paragraph §3.3.2.4 interfaces with the infrastructure are justified by the calculations and gauge plans for the Grenchen TSD drawn up by LEITNER and taken into account by STRMTG-ON. Concerning certificate of origin n°10, the technical documentation on which	R	

#### **Recommendations issued in 2017 - continued**

Completed recommendation R

Amended recommendation RM

Recommendation in progress EC

Rejected recommendation NR Unknown outcome NC

Investigation title	N° Reco	Recommendation wording	Recipient( s)	Date of response	Follow-up and status (literal & codified)	
	R1	Complete the ongoing work to redesign the cable supports and vehicle carriages for the Télémétro and bring them into line with current regulations.	SAP	12/02/18	SAP has commissioned the manufacturer BMF to modify the Telemetro from May 2018. The principle adopted is to remove the carriage brakes from the vehicles, with the supply of new carriages and hangers, allowing the line and station shoes to be replaced by shoes with a larger envelope for the carrying cables. The cables will also be replaced at this time. The machinery will also be modified, but in a smaller way, so as to meet the criteria for justifying the integrity of the single-track cable loop. On the one hand, this enclosure is favorable to the stability of the carrier cables and on the other hand, the trolley/shoe interface will be improved, as the new design will improve the available clearance gauge. The modification was the subject of a dossier d'Autorisation d'Exécution des Travaux, approved by the Savoie prefect in 2018. The modified device should be put into service in autumn 2018, i.e. for its next operating season. The appliance was indeed modified in 2018 according to the provisions indicated above.	R
The Télémétro derailment on 12 January 2017 in La Plagne (73)	R2	Carry out a risk analysis of all the cable cars concerned by STRMTG circular letter no. 86-229, evaluating for each of them the risk factor and the effectiveness of the countermeasures and measures adopted by the operators to protect themselves from the consequences of icing on the supports. Trigger actions to deal with critical situations.	STRMTG	31/01/18	Organization of a meeting with the profession on 22/01/2018 in order to define the treatment strategy. In order to respond to this recommendation, the STRMTG launched a survey by way of a recommendation dated 12/03/2018 to bicable cable car operators owning at least one line tower, including in particular 3S type equipment (i.e. a larger fleet than that covered by circular 86-229). The aim of this survey is to identify the characteristics of the twin-cable installations with regard to the conditions of support of the bearing cables on the line towers, both in terms of the design of the supports and the operating conditions and practices, particularly in the presence of snow. It is also requested that the feedback is recorded with all the events/incidents involving the support of the bearing cables. The feedback from the operators was received in mid-2018; it provides more precise information on the specific features of the design of the supports for each device, as well as on the associated experience feedback and operating instructions. The STRMTG is currently working on this survey, and a draft report has been drawn up to provide an overall view of the compatibility between design elements and associated operating rules, particularly in the presence of snow. This report will be finalized in 2021.	EC
	R3	Establish an instruction specific to the Telemetro specifying the detailed checks to be carried out before a safety shunt and the compensatory measures to be taken afterwards. Include the corresponding training in the training courses.	SAP	12/02/18	SAP established operating procedures on the one hand concerning the specific monitoring of the device (MO145) and the conditions for monitoring and snow removal (MO93) of the telemetro supports in case of snowy weather and on the other hand concerning the conditions for bypassing (MO97) the device's monitoring functions. A training session for the operating personnel was also organized on 17/12/2018 to prepare them for the use of the electrical control- command architecture of the device.	R

Completed recommendation R

Amended recommendation RM Recommendation in progress EC

Rejected recommendation NR

Unknown outcome NC

Investigation title	N° Reco	Recommendation wording	Recipient(s)	Date of	Follow-up and status (literal & codified)		
				response	literal	Coding	
Technical investigation into the immobilization and late	R1	Formalize the lessons learned from the analyses and tests on the dynamic behavior of the Panoramic Mont- Blanc in a document of the "instruction" type for the use of future operating personnel, describing : the settings chosen for the installation must be carefully monitored for changes or drift; the envelope of dynamic effects at risk with a description of the load configurations that produce them; the periodic dynamic tests to be carried out in order to guarantee the stability of behavior over time, by deciding on the criteria, measurable during the tests, allowing to validate the behavior and its non-drifting.	СМВ	07/12/18		NS	
	R2	Supplement the rules of technical guides RM1 and RM2 on dynamic tests, for installations that are sensitive to the effects of cable oscillations, with a double obligation to assess the most penalizing dynamic load cases and to conduct tests with these load cases.	STRMTG	30/11/18	The principles of the response to the recommendation were defined at the profession meeting of 13/11/2018 and were given in the STRMTG's response to the BEA-TT dated 30/11/2018. These principles have been introduced in the draft new versions of guides RM1 and RM2 currently under discussion with the profession. These guides should come into force at the beginning of 2022.	EC	
of the "Panoramique Mont Blanc" cable car on 8 September 2016 in Chamonix	R3	Investigate the feasibility of improving the safety of derailing cabs by strengthening the physical restraint of cabs.	СМВ	07/12/18	This arrangement was included in the prefectoral decree for the resumption of the operation after the event, signed on 6 June 2017. Since then, the WCD has carried out a study on this subject, with its assistant DCSA, leading to the following conclusion; Following the analysis, the detection rod is maintained as a piano wire, with its length adapted to a value that allows the safe detection of the derailment on diabolos. It is more than necessary to maintain the copper cable that connects the rod to the clamp. The search for new types of material for the wand using components that are commonly used today did not lead to a suitable solution either. Thus, the detection of vehicle derailment based on the use of a piano wire is not called into question in principle, as it benefits from good feedback, a sought-after spring effect and has been improved by the installation of a copper cable for electrical grounding between the detection rod and the clamp.	R	

#### **Recommendations issued in 2018 – continued**

Completed recommendation	R
Amended recommendation	RM
Recommendation in progress	EC
Rejected recommendation	NR
Unknown outcome	NC
Outcome not monitored by STRMTG	NS

Investigation title	N° Reco	Recommendation wording	Recipient(	Date of	Follow-up and status (literal & codified)		
inteeligation and			s)	response	literal	Coding	
			STRMTG		The principles of the response to the recommendation were defined during the professional meeting of 13/11/2018 and were given in the STRMTG response to the BEA-TT dated 30/11/2018.		
	R4	Draw up a minimum list of risks to be taken into account in the safety studies of cable cars with integrated recovery and make it available to the engineering offices and operators. Impose, in these safety studies, the taking into account of provisions		30/11/18	For the "minimum list of scenarios" part, a list was drawn up by the STRMTG on the basis of the integrated recovery files already validated and the feedback from cases with immobilized cable cars. It is currently communicated on a case-by-case basis to professionals involved in cable car projects with integrated recovery. This list will eventually be formalized in an STRMTG guide to integrated recovery.	EC	
Technical investigation into the immobilization and late evacuation of the "Panoramique Mont Blanc" cable car on 8 September 2016 in					As far as the final provisions are concerned, the DGITM has been asked to contact the Ministry of the Interior (DGSCGC). A first meeting took place between our services and a reflection is underway to know what legal framework to give to these final plans. In a second phase, a working group will be launched, possibly in 2022, to define the concrete modalities of these final plans.		
Chamonix	R5	Implement a plan to reinforce the safety management of the Panoramic Mont-Blanc operation in a sustainable manner by: guaranteeing the completeness of the safety documentation, and the correct information of the personnel and external interlocutors who must apply it; ensuring traceability and monitoring of malfunctions, as well as the implementation of actions taken to remedy them, ensuring exhaustive traceability of incidents and accidents to consolidate feedback; ensuring a plan to control the interventions of service providers during operating periods.	СМВ	07/12/18		NS	

Completed recommendation R

Amended recommendation RM

Recommendation in progress EC



Investigation title	No. Reco	Recommendation wording		Date of	Follow-up and status (literal & codified)	
investigation the				response	Literal	Coding
Falling from a cabin of the Costebelle cable car on 25 March 2018 in Pra Loup (04)	R1	Continue to make progress in safety management, including improvements in the following areas trace the evolution of the values measured and the maintenance actions carried out on the equipment; carry out an exhaustive report on the differences between practices and the maintenance recommended by the manufacturer, followed by an analysis of the risks generated by these differences; update the procedures describing the essential and safe points for each installation; Strengthen training, particularly continuous training and knowledge control, including the behavior to adopt when faced with alarms; complete the sharing of information with operations and maintenance personnel and the feedback of experience on the data in the operations logbook.	RPLU04	10/09/19		NS
	R2	For new or refurbished safety PLCs, introduce in the regulations the obligation to record and easily retrieve data over a minimum period of one year in order to allow feedback and analysis of the functioning of the device following an incident	STRMTG	09/09/19	The principles of the response to the recommendation were defined during a meeting with the profession on 06/09/2019 and were given in the STRMTG response to the BEA-TT dated 09/09/2019. The concrete measures are defined and have been incorporated into the draft new versions of RM1 and RM2 which are being discussed with the industry in 2021. These new versions should come into force at the beginning of 2022.	EC
	R3	In accordance with Article 34 of the amended Order of 7 August 2009, carry out a full-scale exercise on one of its facilities every year, from simulating a breakdown to the complete evacuation of passenger volunteers, enabling it to test the implementation of resources, equipment and procedures and to ensure that the various participants are properly coordinated.	RPLU04	10/09/19		NS

## Annex 6: Table from the Directorate General for Energy and Climate (DGEC) presenting the follow-up of the implementation of the recommendations issued by the BEA-TT in the field of road transport

#### **Recommendations issued in 2011**

Date of the report	Title of the investigation	N°	Wording of the BEA-TT recommendation	Status of actions	Follow-up
03/2011	Accident of the small road train of Notre-Dame-de-La-Garde on 14 May 2010 in Marseille (13)	R6	Make it compulsory to install a tachometer in tractors of small road trains	The order of 22 January 2015 defining the characteristics and conditions of use of vehicles other than coaches and buses, intended for tourism and leisure purposes, repealed and replaced the order of 2 July 1997. It mentions in its Annex I on the rules applicable to small tourist road trains: I-3. The design speed of the towing vehicle shall not exceed 40 km/h. The motor vehicle shall be equipped with a speedometer complying with the technical requirements of Annex II to Directive 75/443/EC, as amended, and with an odometer.	Closed

Date of the report	Title of the investigation	N°	Wording of the BEA-TT recommendation	Status of actions	Follow-up
03/2013	Rollover of a coach on 17 March 2012 at the Gourvily roundabout in Quimper (29)	R1	Promote to manufacturers and to the bodies responsible for road vehicle standardization the development of ergonomic controls for retarders and speed governors, and more generally for driving aids, which eliminate any risk of confusion between safety functions and assistance functions when they are operated.	The General Safety Regulation (GSR) II No 2019/2144 is a continuation of the first GSR: the aim is to introduce new requirements in the design of vehicles in order to improve their safety by, for example, generalizing existing technologies for passenger vehicles to all categories of vehicles, and vice versa. It is applicable from 6 July 2022.	Closed

Date of the report	Title of the investigation	N°	Wording of the BEA-TT recommendation	Status of actions	Follow-up
04/2015	Road accident and fire in a coach on 16 April 2013 on the RD 211 in La Garde (38)	R1	Supplement the compulsory technical inspection of public transport vehicles with an effective and systematic verification, by means of any appropriate test, of the effectiveness of the hydraulic or electromagnetic retarders fitted to them.	The internal failures identified in the survey relating to the retarder, which represent the vast majority of failures affecting this equipment, could only be detected by means of a complete oil change of the retarder, which cannot be carried out by the technical inspection as this implies a check without dismantling. Changing the oil in retarders is part of the essential periodic maintenance operations, the frequency of which is recommended by the manufacturers, and which are the responsibility of the transporters or repairers. The framework of these maintenance operations is not covered by the regulations relating to technical control. Furthermore, the test conditions and the equipment available at the technical inspection centers do not currently allow verification of this equipment, which is not a mandatory safety element within the meaning of international regulations concerning braking. This type of device is only compulsory when it is essential to comply with the required braking performance for the vehicle concerned, in support of the service brake. Where it is not mandatory, it may be offered by manufacturers as optional additional safety equipment.	Closed
09/2015	Fall of a motorcyclist travelling between two lanes of vehicles on 8 April 2014 on the A6 motorway in Savigny-sur-Orge (91)	R2	Promote with the European Union and the United Nations Economic Commission for Europe (UNECE), the fitting of sufficient side guards on goods vehicles and their trailers to prevent vulnerable road users from slipping under their wheels in all circumstances.	A study was carried out to propose an evolution of Regulation 73 in order to define new mounting and strength rules with adapted deformation parameters for side guards. Proposals have been made and discussions are underway with all stakeholders.	In progress

Date of the report	Title of the investigation	N°	Wording of the BEA-TT recommendation	Status of actions	Follow-up
		R1	Amend Article 13 of the Order of 19 July 1954 on the type-approval of motor vehicles in order to add to the list of significant transformations any addition of a fuel tank with a significant capacity not expressly provided for by the vehicle manufacturer and update the technical instructions on the technical inspection of vehicles accordingly.	Article 13 of the Order of 19 July 1954 was amended by the Order of 15 April 2020 to extend the definition of significant modifications. The technical instruction on technical inspection is currently being amended.	Closed
		R2	In the context of the revision of UNECE Regulation No. 118, propose to strengthen the requirements for the fire performance of materials used in the construction of vehicles and to introduce new requirements for the toxicity of gases released by the combustion of these materials.	Introduction of new tests on the flammability of materials when using unknown adhesives in combination with materials.	Closed
		R3	In the context of the revision of UNECE Regulation No. 107, propose to strengthen the requirements for the opening mechanisms of smoke extraction devices in order to facilitate their opening.	Studies on flammability and toxicity of fumes continue	In progress
07/2017	07/2017 Collision and fire between a bus and a lorry 23 October 2015 on the RD 17 in Puisseguin (33)	R4	<ul> <li>In the context of the revision of UNECE Regulation No. 107, propose:</li> <li>the addition of an emergency door positioned on the rear of the vehicle. Failing that, extend the provisions of Decree No. 2015-1170 of 22 September 2015 on the accessibility of rolling stock assigned to regular interurban public road passenger transport services to all coaches.</li> <li>and/or the strengthening of requirements for emergency window opening mechanisms to make them instantly operable to facilitate use in the event of an emergency evacuation.</li> </ul>	Work is continuing in Geneva, but amendments to these regulations have already been proposed and validated in WP29 of March 2021. These concern: equipping vehicles with safety instructions to infom passengers (location of emergency exits, fire extinguishers) the triggering of a fire alarm above a reference temperature the possibility for the driver to open all doors and activate the emergency lighting simultaneously.	In progress
		R5	Strengthen the regulations on "emergency lighting systems" for coaches to ensure that the safety devices to be used for emergency evacuation and the lighting of the vehicle's escape routes remain visible, particularly in the event of the vehicle's interior being flooded with opaque smoke.	See R4	In progress

#### **Recommendations issued in 2017 - continued**

Date of the report	Title of the investigation	N°	Wording of the BEA-TT recommendation	Status of actions	Follow-up
08/2017	Accident between a cyclist and a truck on 17 August 2015 at the crossroads between the streets of Brussels and Douai to Paris 9 <sup>e</sup>	R1	As part of the revision of UNECE Regulation No. 46 on the approval of systems for indirect vision, propose that all installed mirrors, both driver and passenger, should be adjustable by the driver from the driving position.	The main cause of this accident was the non-visibility of the cyclist by the truck driver. The driver was unable to detect the presence of the cyclist before and during his manoeuvre, either because he did not check his blind spots during his right-turn manoeuvre, or because the mirrors of his truck were badly adjusted. Article 55 of the law on the orientation of mobility requires vehicles over 3.5 tons to be equipped, from 1 January 2021, with signs indicating the position of blind spots. The texts for its application are, on the one hand, decree no. 2020-1396 of 17 November 2020 relating to signs indicating the blind spots on vehicles whose total authorized laden weight exceeds 3.5 tons and, on the other hand, the order of 5 January 2021 applying article R.313-32-1 of the highway code relating to signs indicating the blind spots on heavy vehicles, published in the Journal Officiel on 6 January 2021. Blind spot marking of heavy vehicles is a response to the need to reinforce their awareness by vulnerable road users (cyclists, pedestrians and users of personal mobility devices). Many road users are not aware of the fact that a truck driver cannot see them from the rear and from either side. In addition, Regulation (EU) 2019/2144 (GSR II) establishes mandatory provisions for blind spot information systems or cornering assistants for vehicles of classes M2, M3, N2 and N3, for new type approvals from 6 July 2022 and for first registrations from 7 July 2024, an important step that constitutes a major contribution to improving road safety. Also noteworthy is the development of camera and monitor systems that comply with the regulations for the approval of indirect vision systems.	Closed

Date of the report	Title of the investigation	N°	Wording of the BEA-TT recommendation	Status of actions	Follow-up
01/2018	Collision between a school bus and a lorry on 11 February 2016 in Rochefort (17)	R1	Recommendation addressed to the DGT (Labour), the DGEC, the OPPBTP, the FFC (French Federation of Bodywork) For new installations on heavy vehicles of machinery (within the meaning of Directive 2006/42/EC) whose operation requires the deployment of devices outside the vehicle's normal gauge when stationary, make it compulsory to install audible and visual alarms in the cab to warn the driver that one or more of these devices are not in a safe position for travel or that this position is not locked. These in-cab audible and visual alarms shall not be easily disabled by the driver or any other unauthorized person. These alarms could be replaced/complemented by devices that prevent or limit the vehicle from moving forward at a very low speed (e.g. 5km/h) when a device is not in a safe and locked travel position. Pending this regulatory development, the BEA-TT invites public works companies and bodybuilders to have these devices already exist and are only installed at the customer's request.	The DGT is the lead national service in charge of the European "machinery" regulation. DGT: notice to chassis manufacturers, manufacturers, importers, distributors, hirers and users of hydraulically powered tippers published in the OJ on 14 July 2020	Closed

Date of the report	Title of the investigation	N°	Wording of the BEA-TT recommendation	Status of actions	Follow-up
02/2020	Bus accident on 26 May 2018 on the A7 motorway in Chantemerle-les-Blés (26)	R2	In the context of the revision of UNECE Regulation No. 54, propose to introduce specifications for the resistance of tires to severe external impacts, which are likely to occur frequently in traffic.	The tire on the vehicle had both the European and DOT (USA) approval markings meaning that it met the regulatory requirements in the USA and had therefore undergone the so-called "braking energy" test referred to in the accident report, which unfortunately was not sufficient to prevent the tyre from bursting. The addition, in the UN international regulation (R54), of the puncture test provided for by the American regulation does not seem appropriate insofar as the performance of this test on the tire did not make it possible to avoid its bursting and therefore the accident. Priority should be given to prevention and maintenance rather than a test that could not cover all the anomalies that may occur in the life of a truck tyre that travels between 100,000 and 400,000 km.	Closed
11/2020	Bus fire on 10 March 2019 on the A6 motorway in Le Coudray-Montceaux	R1	In the event that France's proposed amendment on electronic devices for breaking emergency window panes is not accepted by the UNECE bodies, propose to supplement Regulation No. 107 by defining a test method and a required level of performance to assess whether safety glass can be considered as easily breakable.	Work is still in progress with the UNECE bodies in the framework of the sub- group initiated after the Puisseguin accident, and should be completed by the end of the year. With regard to the recommendation concerning the addition of window-breaking performance requirements, the DGEC considers that this could be considered in order to align practices between manufacturers. For information, on the basis of the tests carried out in France, no particular difficulty in breaking windows has ever been noted during the approval of glazing under UNECE Regulation No. 43 on the approval of safety glazing and the installation of such glazing on vehicles.	In progress

# Annex 7: Table from the Road safety delegation (DSR) presenting the follow-up of the implementation of the recommendations issued by the BEA-TT in the road transport field

Date of the report	Title of the investigation	N°	Wording of the BEA-TT recommendation	Status of actions	Follow-up
10/2015	Motorcyclist falls between two lanes of vehicles on the A6 motorway on 8 April 2014 in Savigny-sur-Orge (91)	R1	In the context of the planned experiment on the movement of two and three-wheeled motor vehicles between lanes, raise awareness, through appropriate communication, of the importance of the speed limit imposed between lanes for their safety. In addition, define the means to easily and permanently monitor compliance with this requirement before any generalization of this experiment.	Publication of Decree No. 2015-1750 of 23 December 2015 on the experimentation of inter-city traffic. Introduction, as part of this experiment, of a 50 km/h speed limit for 2WDs for ICF use. In this context, a communication campaign was set up in 2016: 500,000 CIF leaflets for motorcyclists and scooterists and 300,000 for other users were printed. These documents were sent by the DSR: to the prefectures and driving schools of the departments concerned by the experiment; to all the prefectures of the other departments for their information; at two motorbike dealerships. In addition, they were published in the specialized motorized two-wheeler press and also in the free press (20 Minutes). Field operations were also carried out in Paris, Lyon, Marseille and Bordeaux, in order to distribute the documents to motorized two-wheeler drivers and other users.	Closed

Date of the report	Title of the investigation	N°	Wording of the BEA-TT recommendation	Status of actions	Follow-up
09/2016	School bus on the RD160 goes off the road in Einville-au-Jard (54) 3 February 2014	R1	Promote, through consultation or regulation, the broadcasting of pre-recorded audio or video messages informing passengers of the importance of and obligation to wear seat belts in all coaches operating a school transport service, a regular interurban line or an occasional medium or long-distance service. These messages could be included in more general messages reminding passengers of safety and evacuation instructions and obligations.	Joint DGITM/DSR response letter of 24 April 2017 explaining that the improvement of passenger information should be left to the initiative of coach transport stakeholders before considering imposing it by regulation. The letter mentions that an interministerial reflection could be undertaken in parallel around a road safety communication on the wearing of seatbelts in coaches.	In progress
10/2016	Collision followed by fire between three road vehicles and two coaches 13 February 2015 on the A1 motorway at Roberval (60)	R3	Study the possibility of revising Article R. 412-12 of the Highway Code to take account of the particular case where, when two vehicles are following each other, the first is a vehicle or combination of vehicles whose total authorized laden weight exceeds 3.5 tons or whose length exceeds 7 meters. This adaptation could consist of introducing a new minimum safety distance to be respected, specific to this particular case.	Reply letter to BEATT of 9 September 2017 explaining that no changes to Article R. 412-12 are envisaged. On the other hand, multi-functional speed cameras should make it possible to strengthen control and the fight against the failure to observe safety distances. In addition, tunnel managers can install blue markers to help identify safety distances in tunnels. In its response, the DSR mentioned an experiment with a road safety information panel on the respect of safety distances in tunnels, by marking the blue lighted marker posts, which is currently underway in the Foix tunnel. Following the positive evaluation of this experiment, an optional information panel should be integrated into the signage regulations before the end of 2021. In addition, the blue bollards in tunnels, already present in many tunnels, are included in the next evolution of the signaling regulations, scheduled for June 2021. They will remain optional.	Closed
12/2016	Collision between a passenger train and a low-loader 21 April 2015 on the PN n°41 at Nangis (77)	R1	Better inform exceptional transport companies and their drivers of the existence of level crossings presenting crossing difficulties within the meaning of Article 12 of the Order of 4 May 2006 relating in particular to exceptional goods transport, by indicating these level crossings as special points on the national map of exceptional transport routes and on equivalent interactive maps, and by systematically notifying the managers of the roads concerned.	Creation of a national map of TE networks and publication of this map on the IGN geoportal in March 2021 (press release of 29/03/2021). This mapping includes level crossings located on or near a TE network, their associated crossing requirements, with a specific visual representation of identified NPs with difficult crossings. The data on this map is freely available. The mapping will be regularly updated twice a year.	Closed

Date of the report	Title of the investigation	N°	Wording of the BEA-TT recommendation	Status of actions	Follow-up
08/2017	Accident between a cyclist and a truck on 17 August 2015 at the crossroads between Rue de Bruxelles and Rue de Douai in Paris 9°	R4	Strengthen actions to raise cyclists' awareness of their particular vulnerability to the blind spots of heavy vehicles.	Publication of decree no. 2020-1396 of 17 November 2020 relating to signs marking the blind spots on vehicles with a total authorized laden weight exceeding 3.5 tons. Obligation for all HGVs, buses and coaches over 3.5 tons to display the introduction of "blind spot stickers" on the sides and rear of the vehicle or trailer, which will be mandatory from January 2021	Closed

#### **Recommendations issued in 2018**

Date of the report	Title of the investigation	N°	Wording of the BEA-TT recommendation	Status of actions	Follow- up
04/2018	Collision between a bus, two light vehicles and a motorbike on 17 September 2015 on the A8 motorway at the tollgate of La Turbie (06)	R2	Installing a discriminating radar on the La Turbie slope	On the route concerned from the border, numerous discriminating and autonomous radar devices have been installed or are being deployed; targeted interventions by the police using laser radars complement these devices.	Closed

Date of report	Title of the investigation	N°	Wording of the BEA-TT recommendation	Status of actions	Follow- up
05/2019	Collision between a passenger train and a coach 14 December 2017 on LC No. 25 in Millas (66)	R4	Update and complete the provisions of the circulars on level crossing safety and their implementation documents so that safety diagnoses become more complete and high- quality risk analyses in order to make the necessary preventive actions more relevant.	Participation and contribution of the DSR to the implementation of the Action Plan to improve safety at level crossings. The actions on level crossing safety diagnoses are led by the DGITM. They include the generalization of level crossing diagnostics and the updating of the diagnostic form. The obligation for managers to carry out a diagnosis was introduced in Article 125 of the Mobility Orientation Law and by Decree 2021-396 of 6 April 2021. The new diagnostic form has been validated by the DGITM.	Closed

### Annex 7

### **Organization chart of the BEA-TT**



#### **Institutional texts**

European Directive 2016/798 of 11 May 2016

Law n° 2018-515 of 27 June 2018 for a new rail pact

Order No. 2019-397 of 30 April 2019 transposing Directive (EU) 2016/797 on the interoperability of the rail system within the European Union and Directive (EU) 2016/798 on railway safety and adapting French law to Regulation (EU) 2016/796 on the European Union Agency for Railways

Decree No. 2019-525 of 27 May 2019 on the safety and interoperability of the rail system and amending or repealing certain regulatory provisions

Order of 27 May 2019 on the conditions and modalities of notification and designation of conformity assessment bodies and accredited internal bodies.

Transport Code: Articles L. 1621-1 to L. 1622-2 and Articles R. 1621-1 to R. 1621-26

Tourism Code: Article L. 342-8 making Articles L. 1621-1 to L. 1622-2 of the Transport Code applicable to ski lifts



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