REVIEW TABLE

Party	Section	Response to the draft report	Explanation of the Dutch Safety Board
Bombardier / Siemens	General	Risk assessment has two parts, namely frequency and consequence. This report is missing any discussion about what can be done to reduce the likelihood of such an accident occurring. Rather, it only covers minimising the effects of an accident once it has occurred. To remain balanced, it should consider management of the likelihood of accidents – through train systems, signaling systems and the operators.	The investigation has two parts, of which the part on crashworthiness was sent to Bombardier. The first part of the investigation, which examines the relevant facts and the causes, was not sent to BT-SAG for inspection.
Bombardier / Siemens	General	If OVV conclude that the design of a train's interiors contribute in some way to the number and severity of injuries in an accident, then the report should make clear and concise recommendations to the railway industry on ways in which improvements can be made to a train's design. These recommendations should be in a separate standalone section of the report, and they should be as specific as possible.	The Safety Board sees it as its task to point out any aspects that are in need of improvement. The Safety Board does not recommend concrete solutions but has instead collected and made available relevant information for further investigation by the parties involved.
Bombardier / Siemens	General	The collision involved two very different trains. The report should address each train's design separately. Currently it is confusing as at times the discussion mixes both types.	See Chapter 2, Relevant Facts Both trains are treated separately in the dataset.
Bombardier / Siemens	General	As the BT-SAG consortium has only seen chapter four of the report, it is not clear how the overall management of railway collision risk is discussed. We would hope that due weighting is given to the principle that the first rule of collision risk is incident avoidance, with passive safety playing a secondary role in mitigating the severity of outcome when a collision occurs.	The investigation has two parts, of which the part on crashworthiness was sent to Bombardier. The first part of the investigation, which examines the relevant facts and the causes, was not sent to BT-SAG for inspection.
Bombardier / Siemens	Footer	Whiplash occurs in front end collisions. It depends which way the passenger was seated: rearward facing or forward facing.	This is an issue of formulation. The chosen formulation assumes that a head-on collision is experienced as a rear collision by the travellers sitting facing rearward.
Bombardier / Siemens	4.1, 4.2	The text in these sections of the report is a general discussion on the factors that affect the severity of a train crash. They are not specific to the train crash of interest. Section 4.3 then goes on to discuss the specific train crash and relates the discussion back to sections 4.1 and 4.2. This is the wrong way around. It is suggested that the description of the crash on 21 April should lead, and the information provided in sections 4.1 and 4.2 should be in an appendix. The report needs to clearly separate the facts of the crash and train design from any discussion about how train interiors can be changed in the future.	The report is written from the perspective of a reader with no knowledge of crashworthiness.
Bombardier / Siemens	4.2.1	This is not necessarily so. The change in speed is dependent on the level of energy absorption.	The absorption of energy during the collision can indeed lengthen the duration of the collision. But the term 'collision' implies an exchange of forces of short duration, with resulting speed changes occurring within a short time span (i.e. abruptly).
Bombardier / Siemens	4.2.2	The issues raised in this paragraph do not represent established best practice. In addition the European Safeinteriors was not published until 2010; see footnote 10 page 4.	It is true that not all measures taken have since been implemented (widely). It is also true that the research project in question had not been completed when the trains in question were designed. The summary however is of 'potential' control measures.
Bombardier / Siemens	4.2.2	This is not an establish fact or best practice.	See previous explanation.
Bombardier / Siemens	4.2.2	Such measures can also reduce personal security (for instance by reducing sightlines/visibility) and restrict freedom of movement for reduced mobility passengers.	Measures that positively impact crashworthiness can indeed have negative consequences in other areas and a balance clearly has to be struck between these interests. The Dutch Safety Board does not consider it necessary to include this specifically in the current context.
Bombardier / Siemens	4.2.2	Please note that 'foldable' features also need to be evaluated in the context of vandalism.	See previous explanation.
Bombardier / Siemens	4.2.2	We have not received any reports of passengers receiving major injuries caused by loose objects.	The comment is correct in itself but the text concerned is general in nature.

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Bombardier / Siemens	4.2.2	This is not an establish fact or best practice. There have been reports that conclude that airbags and seatbelts on trains do not provide the level of interior safety achieved in cars. It should also be noted that buses do not have seatbelts and airbags and most coaches do not fit airbags as standard. Cars, buses and coaches are free to drive anywhere on the road. Trains in most instances are controlled by a signalling system that keeps trains apart. The signalling system is therefore a huge collision risk reduction system that helps the railway to be far safer than roads despite not having airbags and seat belts. Please also note that children are not supposed to travel in the front of cars due to the injuries that can be caused in a collision by the airbag. Passive safety (exterior and interior) is an accident severity reduction approach. Signalling systems are accident prevention and hazard management systems.	The distinctions made are correct in themselves. However, the text in question concerns potential measures. For each measure a comparative assessment must of course be made regarding the use/necessity or cost-benefits and the consequences for other interests. It is true that not all measures taken have since been implemented (widely). It is also true that the research project in question had not been completed when the trains in question were designed. The summary however is of 'potential' control measures.
Bombardier / Siemens	4.2.3	The referenced Appendix 4 is not available	BT-SAG has not received Appendix 4 for inspection.
Bombardier / Siemens	4.2.2	The requirements for fixings, fire safety and safety characteristics for glass have been applied to the design of the SLT interior and compliance confirmed by the independent assessor (the Notified Body) as part of the homologation process. It should also be noted that the crash performance of the train is for collisions of 36 kph. This collision speed was 50 kph, which is an additional 93% of energy for the carbody structures to absorb and the interiors and passengers to withstand.	The text in question describes the legal and regulatory situation surrounding the crashworthiness of the interior and not the degree to which the trains in question comply or not.
Bombardier / Siemens	4.2.3	BT/SAG is not aware of a protocol for managing interior safety risks in the event of a collision in Dutch or European Law. Moreover aspects of managing this risk mentioned in the report are not correct or agreed. Please see comments to earlier statements. The modern day customer requirements and design practice is for bright open interiors. This provides a more pleasant travelling environment and is a deterrent to vandals, arsonists and violent criminals. The reductions in these risks are considered significant in comparison to the older compartments and partitions and the potential benefits that may rise in a collision. It should also be noted that this is severity reduction not hazard reduction. Hazard reduction is achieved by preventing or reducing the likelihood of the collision in the first instance. Please also refer to a later statement in the report 4.2.3 line 21 Crashworthiness of trains interior" Current legislation does not specify any generic requirements as to the crashworthiness of the train interior"	This is a matter of language/translation. There is indeed no 'protocol' setting out how the injury risk should be controlled (see the NL text).
Bombardier / Siemens	4.4.1	The wording implies that the diagrams are a matter of fact, whereas the footnote makes it clear that the data is from simulation. The wording of the main body text should be clear that the diagrams are simulated representations only.	The previous sentence and the caption with the figure clearly demonstrate that this is about a simulation.
Bombardier / Siemens	4.4.2	The number of passengers on each train is also a major consideration. According to OVV there were approximately 420 passengers on the trains. Appendix 4 details.	A correct comment; this distinction was already raised in the previous text. This section focuses on injury in relation to the interior.
Bombardier / Siemens	4.6.1	BT/SAG notes this section but does not consider that the SLT vehicles contributed to the collision. BT/SAG confirms that the SLT is fitted with the specified signaling and train protection systems which were available at the time of the collision but were not in use on the line where the accident happened.	The chapter concerned only discusses the issue of passive safety; active safety is examined in Chapter 3 of the report.
Bombardier / Siemens	4.6.2	BT/SAG understands that it was not the intention that the EN standard takes into account for all variations of vehicle interfaces with respect to crash. There is a potential for it to be prohibitive in buying new rolling stock if there is a built in responsibility for the new and old rolling stock to be crash compatible. The existing rolling stock is not crash compatible with all other old rolling stock; hence the inference is not consistent.	The regulations do not take account of the incompatibility with the existing fleet, though an operator purchasing new trains should take it into consideration.

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Bombardier / Siemens	4.6.3	The crash safety improvements discussed earlier in this report are not all accepted and agreed when considered against other safety risks e.g. vandals, arsonists, violent criminals. In addition the TSI and associated ENs strive to specify and support integration, common interfaces and safety. NSRs infrastructure managers and operators must take this into account when formalising regulations and requirements.	The Dutch Safety Board is aware of the fact that crashworthiness is only one of the many aspects to be considered in the design and purchase of trains. However, NSR did not consider crashworthiness in combination with these other interests with respect to the trains in question.
Bombardier / Siemens	4.7	It is BT/SAG understanding that the Operations instruction for the Intercity trains instructs crew to evacuate the cab in the event of a potential collision. This is the recognised control measure to counter not having a crashworthy cab.	The recommendation to evacuate the cabin if possible does not alter the conclusion that improvements can be made to the cabin.
Bombardier / Siemens	4.7	Open areas in regional commuter trains and metros, is a recognized arrangement that has been used on trains for many years. Preventing trains coming together must be the focus of collision prevention. At worst case collision at lower speeds are clearly survivable however, this collision was at a relatively high speed.	Although the Safety Board agrees that there must be maximum avoidance of collisions, this is not to say that the issue of passive safety can be ignored.