

**On April 2014, the JTBSB added the level crossing accident with fatality in the level crossing without crossing gate, i.e., class three and class four level crossing, where in high risk of accident, to the subject of the investigation, for the reduction of number of fatalities by the accident in the railway and tramway operation.**

**In the opportunity that five years had passed from the start of the investigation, the investigation reports published so far were analyzed and put together the "example of measures" to prevent the similar accidents.**

**2. Status of occurrence of the accident with fatality in the level crossing without crossing gate**

The 39 accidents with fatality had occurred in the level crossing without crossing gate in the period from April 2014 to January 2019, as shown in Table 2. Among these, the JTBSB had published 34 railway accident investigation reports by January 2019, and investigating remained 5 accidents. Refer to Table 3 in page 20 to 21, for the summary of the published 34 railway accident investigation reports.

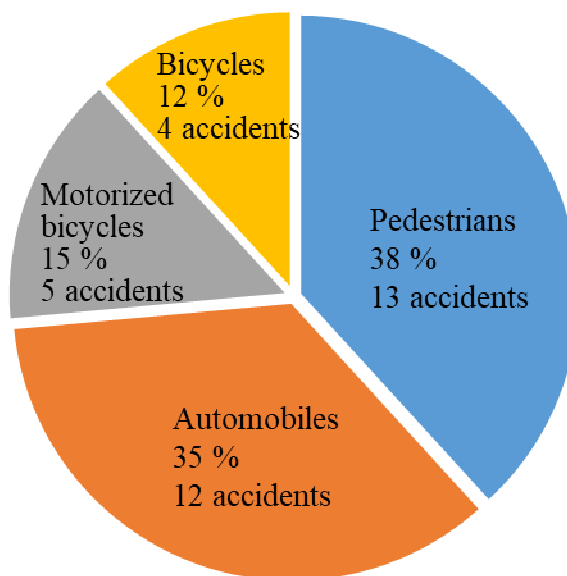
Table 2. Number of occurred accidents with fatality in the level crossing without crossing gate

	2014 FY	2015 FY	2016 FY	2017 FY	2018 FY, till to Jan.	Total
Class three level crossing	1	0	3	1	1	6
Class four level crossing	4	5	13	5	6* *5 are investigating	33
Total	5	5	16	6	7	39

**Classification of occurred accidents** Classified 34 published railway accident investigation reports

(1) Details of passersby of level crossing

The most was pedestrian, 13 accidents, 38 %, the second most was automobiles, 12 accidents, 35 %.



\* "Automobile" include the light motor vehicle and small sized special vehicle, i.e., tractor for agriculture.

Figure 3. Details of passersby of level crossing

(2) Age of the passersby, or driver of crossing automobile, of level crossing

The ratio of aged person, 65 years old or above, was 18 accidents, 53 %, *i.e.*, occupied over half.

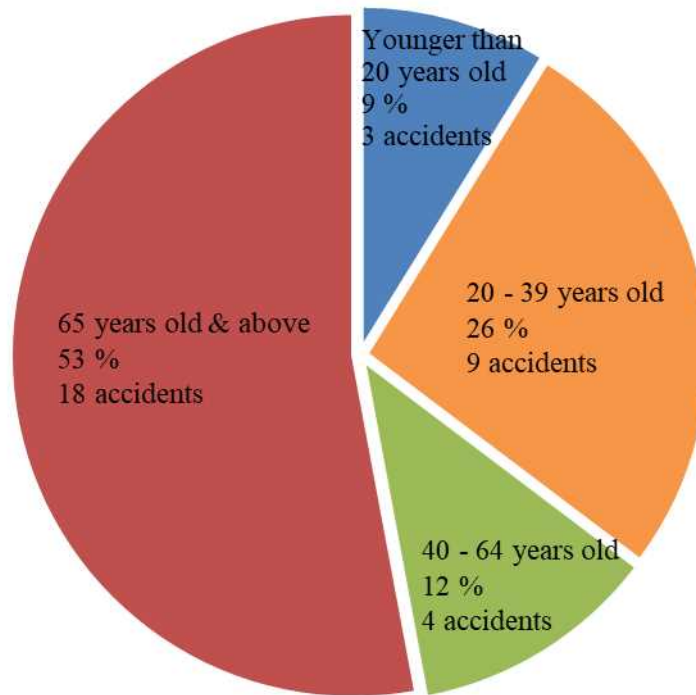


Figure 4. Classification by the age of passersby of level crossing

(3) Velocity of the train when the passerby was found

The ratio of 60 km/h or above was 79 %, 27 accidents, *i.e.*, velocity of train is high.

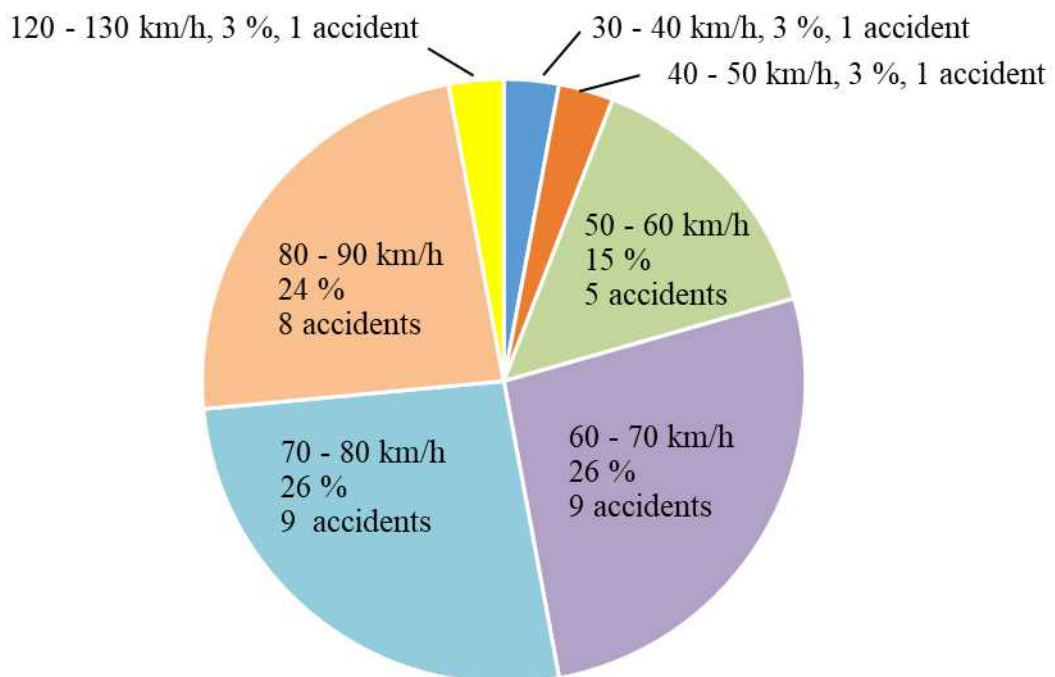


Figure 5. Velocity of the train when the passerby was found

#### (4) Classification by the relevant causes

The major factors, considered the possibility as related to the passersby entering the level crossing in the situation that the train was approaching to the level crossing, were classified as follows.

- (i) Bad visibility of trains from the once stop position of the level crossing.
- (ii) Passersby, automobile, etc., did not stop before the level crossing.
- (iii) The restriction of physical function of the passersby had been affected.

Refer to "7. Examples of the accident investigation, pages 16 - 19, and Table 4, page 22 - 23.

### 3. Implement measures urgently such as to abolish or install of crossing gate and road warning device, in the level crossing without crossing gate

#### (1) Level crossing without crossing gate is dangerous

The rules, to stop once before the level crossing and check safety of left and right, after that, across the level crossing, have been recognized by many people, inspired by the safety education in the schools, etc., and guided in the lectures in the training to acquire driver's license of automobiles, etc., and individual passerby have been implemented definitely.

It is necessary for the passersby to implement certainly the confirmation of safety whether train is approaching or not, particularly in the level crossing without crossing gate.

However, as described in the above (4) relevant causes, the accident occurred as the passerby could not confirmed safety due to some factors and entered the level crossing when train was approaching. Like this, the level crossing without crossing gate has high risk of accident.

#### (2) Some safety measures depended only to the awareness of passerby of level crossing have a limit

Among 34 accidents with fatality in the level crossing without crossing gate, that the JTSB had published the investigation report by January 2019, 10 accidents, including the accidents without casualties, had been occurred in the same level crossing.

Among these 10 accidents, there were the level crossing where implemented the traffic control, the installation of sign board to call attention, etc., responding to the past accidents, but accident occurred again.

Moreover, among 34 accidents which the accident investigation reports were published, over half 18 accidents were the case that passerby of level crossing was the aged person over 65 years old, and six accidents were the case that passerby of level crossing was the handicapped person in the hearing function, etc.

Furthermore, it is probable that there is the characteristics that the driver of automobile is hard to confirm the train compared to the pedestrian, because the driver of automobile confirms the approaching train from the position of the driver's seat, located further backward of the once stop line of the level crossing.

In addition, it is considered as difficult for the passerby of level crossing to judge visually the time till the train approach at the level crossing when the velocity of the train is fast, for example, the train running in 120 km/h advances about 33 m in one second.

Therefore, there is the case that the safety measures only depending on the awareness of passerby in the safety confirmation whether train is approaching or not, in the level crossing without crossing gate, have a limit.