

ITARDA INFORMATION

交通事故分析レポート No.115

Special
feature

Pedestrian–four-wheeled vehicle accidents in parking lots and similar locations

~Such locations where people tend to be careless,
require additional confirmation of safety factors~

Small reduction in the number of pedestrian casualties
in parking lots and similar locations (general traffic locations)

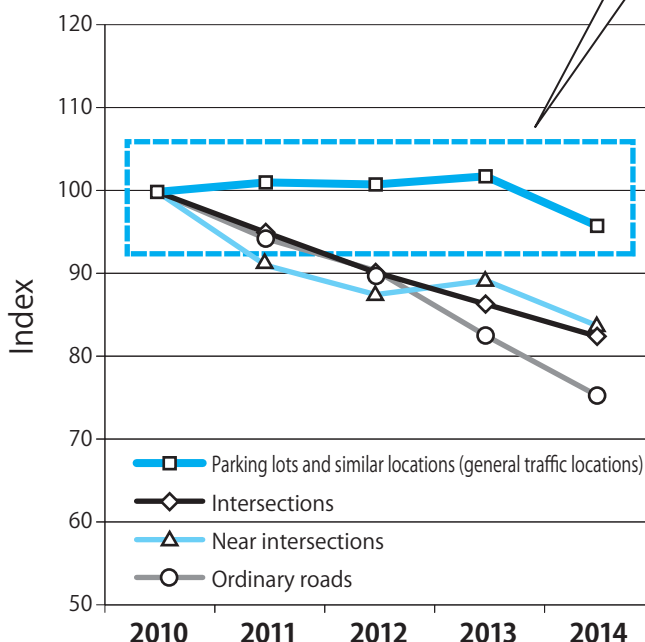


Fig. 1. Trends in the number of pedestrian casualties
in pedestrian–four-wheeled vehicle accidents
by type of road configuration

(The number of casualties is the total from the primary and secondary parties when the number of casualties from 2010 is taken as 100)



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1 Introduction

Have you ever had any of the following experiences when driving a vehicle in a parking lot of a shopping center or a convenience store?

- While you're driving through a parking lot looking for a parking space, a child suddenly dashes out from between two parked cars and you almost hit the child.
- When backing out of a parking lot you realize there's a pedestrian walking right behind your vehicle and you almost hit the pedestrian.

Anyone who has driven a four-wheeled vehicle through a parking lot could have experienced these sorts of near-misses before. Some drivers might have even ended up colliding with pedestrians.

To get a grasp of the actual status for the number of pedestrian casualties from pedestrian–four-wheeled vehicle accidents that occur in parking lots and similar locations^{Note 1)}, the total results for the number of pedestrian casualties from pedestrian–four-wheeled vehicle accidents by type of road configuration are shown in Table 1 (the number of casualties at railroad crossings is extremely small compared with those at other road configurations, so they were not included). In addition, based on Table 1, the trends when the number of casualties from 2010 taken as 100, are shown in Fig. 1. Apparently, the number of pedestrian casualties in parking lots and other locations from 2010 to 2014 has not declined all that much compared with those at intersections, near intersections, and on ordinary roads.

Therefore, in this issue of ITARDA INFORMATION we would like to introduce the characteristics of pedestrian–four-wheeled vehicle accidents in parking lots and similar locations, primarily from a pedestrian perspective (“pedestrians” as used in this paper refer to the “general pedestrians” as found in the Road Traffic Accident Statistics).

Table 1. Number of pedestrian casualties from pedestrian–four-wheeled vehicle accidents by type of road configuration

Road configuration	2010	2011	2012	2013	2014	Vs. 2010
Intersections	26,123	24,708	23,464	22,527	21,443	0.82
Near intersections	4,496	4,072	3,923	4,013	3,739	0.83
Ordinary roads	19,592	18,380	17,577	16,242	14,775	0.75
Parking lots and similar locations (general traffic locations)	6,299	6,364	6,340	6,400	6,022	0.96

* Railroad crossings were omitted

* Pedestrians refers to the “general pedestrians” as found in the Road Traffic Accident Statistics

Note 1) Accidents that occur in parking lots of shopping centers and convenience stores are classified as accidents that occur at “general traffic locations” in the Road Traffic Accident Statistics. However, the parking lots discussed here do not include locations where people and cars cannot freely pass through, such as home parking lots or parking lots where transit is controlled by means of having a security guard or similar personnel stationed there. General traffic locations refer to those locations among the “locations to be used for general traffic and other uses” stipulated in Paragraph 1, Section 1, Article 2 of the Road Traffic Act in which the road width cannot be easily measured, such as plazas, vacant land, and so forth (excluding locations that have structures that are generally used as roads, like private roads). General traffic locations include parking lots for stores and other buildings, as well as plazas, vacant land, highway service areas, parking areas, and more. Considering that all of these are frequently used as parking lots, this report will survey and analyze accidents that occur at general traffic locations as “accidents that occur in parking lots and similar locations.”

2 Characteristics of pedestrian–four-wheeled vehicle accidents in parking lots and similar locations

■ The number of pedestrian casualties aged 65 and over are on the rise

Table 2 shows the number of casualties in parking lots and similar locations from 2010 to 2014. In addition, Fig. 2 shows the trends by age group with the number of casualties from 2010 taken as 100. While there have been temporary increases in the number of casualties for people aged 6 or under, 7 – 18, and 19 – 64 between 2010 and 2014, they have been trending downward up through 2014. As opposed to this, the trend has simply gone up for people aged 65 or over between 2010 and 2014.

Table 2. Number of pedestrian casualties in pedestrian–four-wheeled vehicle accidents by the pedestrian age group

Pedestrian age group	Number of casualties (number of people)					
	2010	2011	2012	2013	2014	Vs.2010
6 or under	331	347	349	297	296	0.89
7 – 18	255	281	274	265	214	0.84
19 – 64	3,688	3,661	3,555	3,661	3,321	0.90
65 or over	2,025	2,075	2,162	2,177	2,191	1.08
Total	6,299	6,364	6,340	6,400	6,022	0.96

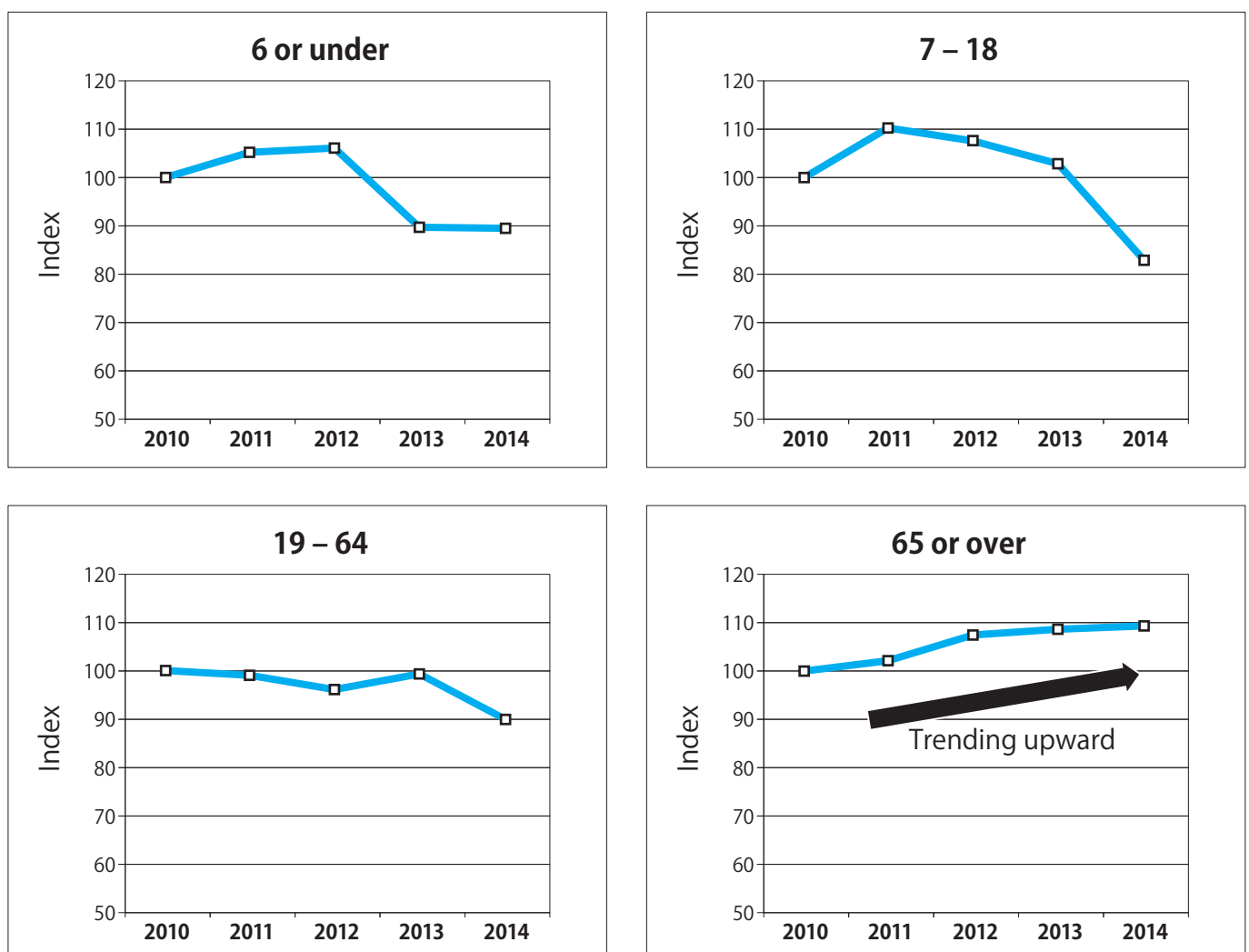


Fig. 2. Trends in the number of pedestrian casualties in pedestrian–four-wheeled vehicle accidents by pedestrian age group (number of casualties from 2010 is taken as 100)

Children aged 6 or under are involved in fatal or serious injury accidents even in parking lots and similar locations

Perhaps some people think that pedestrian–four-wheeled vehicle in parking lots and similar locations do not lead to death or serious injury of the pedestrian. Therefore, we will examine whether or not there is any difference in the percentage of fatalities or serious injuries in “Parking lots and similar locations” or in “All other locations.” To do this, Fig. 3 shows a graph comparing the percentage of fatalities or serious injuries for each pedestrian age group for pedestrian–four-wheeled vehicle accidents in “Parking lots and similar locations” and in “All other locations.” Apparently, the percentage of fatalities or serious injuries among children aged 6 or under in “Parking lots and similar locations” is roughly the same as the percentage in “All other locations.” In other words, when children aged 6 or under encounter accidents in “Parking lots and similar locations” it is similar to when they encounter accidents in “All other locations” in that these tend to be fatal or serious injury accidents. To investigate the causes for this, Fig. 4 shows graphs comparing the composition rate for the major parts of the body injured for each pedestrian age group in pedestrian–four-wheeled vehicle accidents in “Parking lots and similar locations” and “All other locations.” It only targets pedestrians who have injuries running the range from fatal to serious injury. It reveals that people aged 7 or over suffered death or serious injury from damage to their head, face, chest, and abdomen in “All other locations” more so than in “Parking lots and similar locations.” On the other hand, with children aged 6 or under similar trends were observed in “Parking lots and similar locations” and in “All other locations.” Presumably, since the collision speeds of four-wheeled vehicles are relatively slow in “Parking lots and similar locations” pedestrians are not sent flying by four-wheeled vehicles, but are oftentimes knocked over right beside the four-wheeled vehicle. With children aged 6 or under, after being knocked over their head, chest, or abdomen are frequently run over by four-wheeled vehicles because of their short height. This is presumably why the percentage of these body parts being injured is the same as it is in “All other locations.”

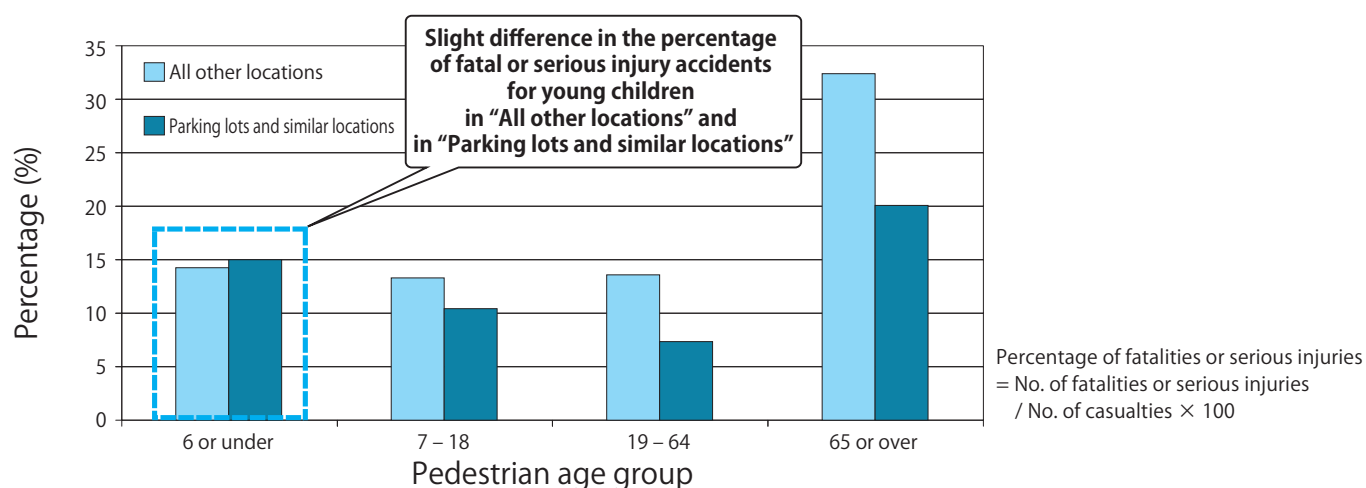


Fig. 3. Percentage of fatalities or serious injuries by road configuration and pedestrian age group (2010 – 2014)

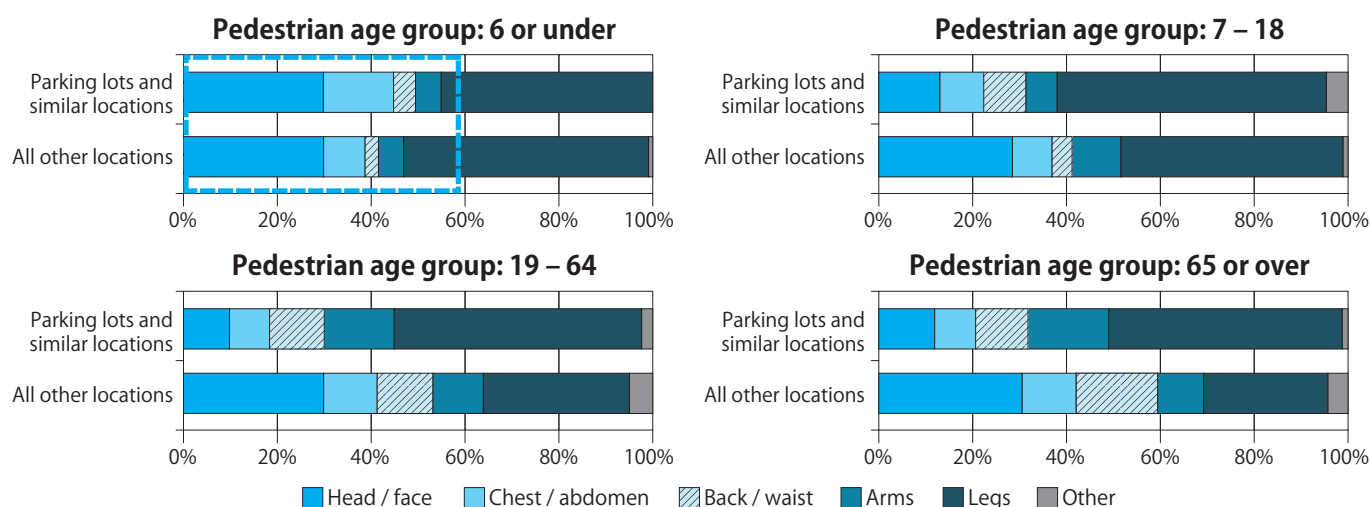


Fig. 4. Major parts of the body injured by the pedestrian age group (2010 – 2014)

Human factors of the pedestrians

The composition rate for human factors by the pedestrian age group for pedestrian–four-wheeled vehicle accidents that occurred in parking lots and similar locations is shown in Fig. 5. Nearly 80% of people aged 19 or over had “No human factor,” while for people aged 18 or under the younger they are the higher the percentage of people in which some sort of human factor played a part. In other words, it shows that pedestrians aged 18 or under get into accidents because they fail to obey the traffic rules more frequently than the people in other age groups do.

Furthermore, in order to investigate in detail whether or not there are any special characteristics with human factors by age group, Fig. 6 shows the composition rate for human factors by pedestrian age group (excluding “No human factor”). For people aged 19 or over, the higher their age group the higher the percentage of “Delay in noticing due to a failure to confirm safety factors.” While the percentage from “Delay in noticing due to a failure to confirm safety factors” is large even among children aged 7 – 12, with this age group the failure to confirm safety factors is due to a tendency to completely fail to confirm safety factors. With children aged 6 or under, the percentage from the inattention of their parents or guardians account for roughly 70% of the total, revealing that said children tend to get into accidents in parking lots and similar locations because their parents or guardians were not paying attention to what they were doing. Therefore, we would like to take a detailed look at “Inattention of parent or guardian,” which accounts for the human factors with children aged 6 or under more than 70% of the time.

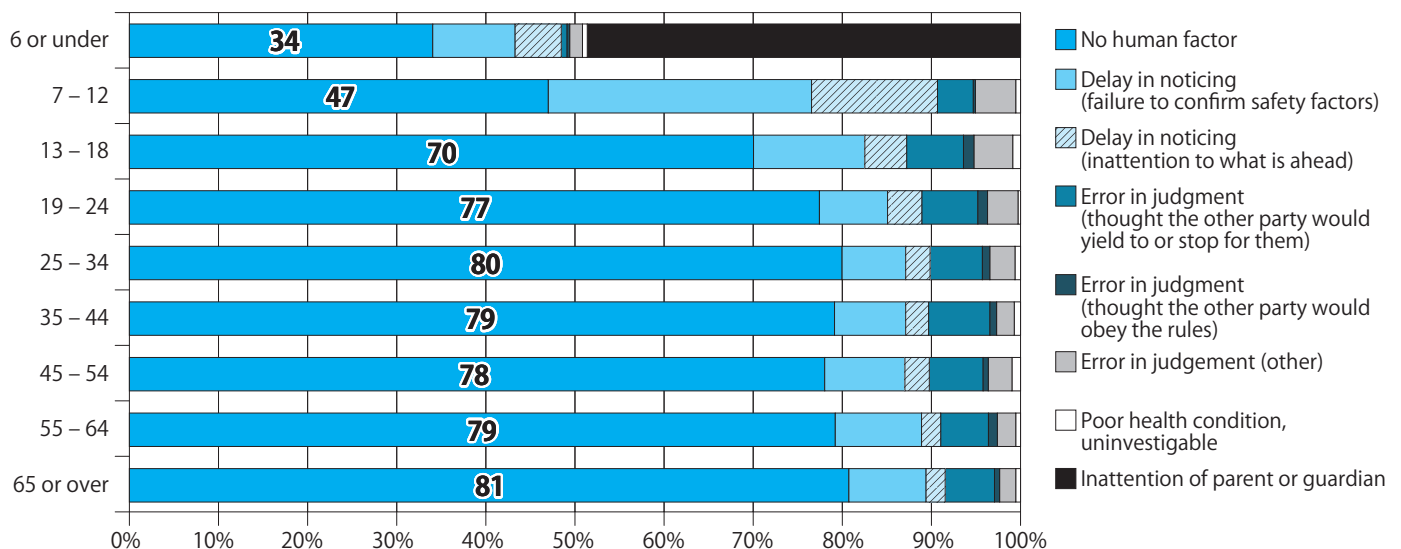


Fig. 5. Composition rate for human factors by the pedestrian age group (2010 – 2014)

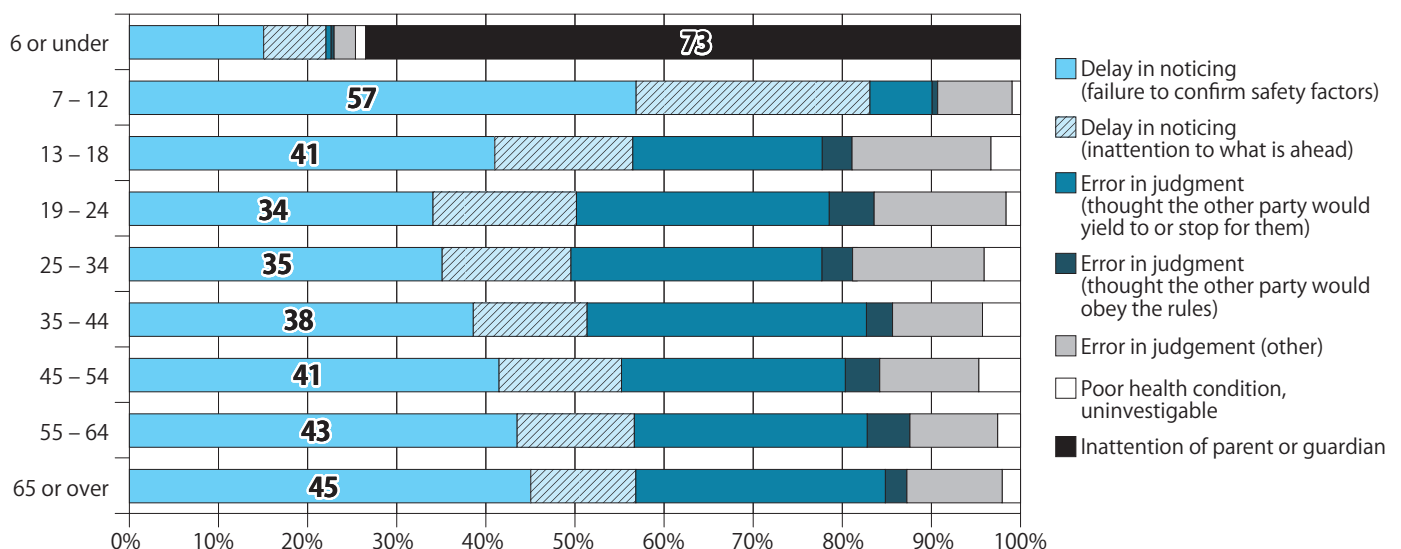


Fig. 6. Composition rate for human factors by pedestrian age group (excluding “No human factors”; 2010 – 2014)

Fig. 7 shows a detailed composition rate for the human factor “Inattention of parent or guardian.” “Not holding hands” accounted for 70% of the cases of “Inattention of parent or guardian.” Examining the reasons for not holding hands with children reveals that “I thought it was safe” shows up with conspicuous frequency (Fig. 8).

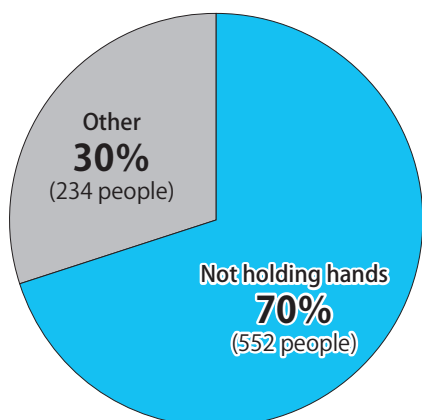


Fig. 7. Composition rate for inattention of parent or guardian (2010 – 2014)

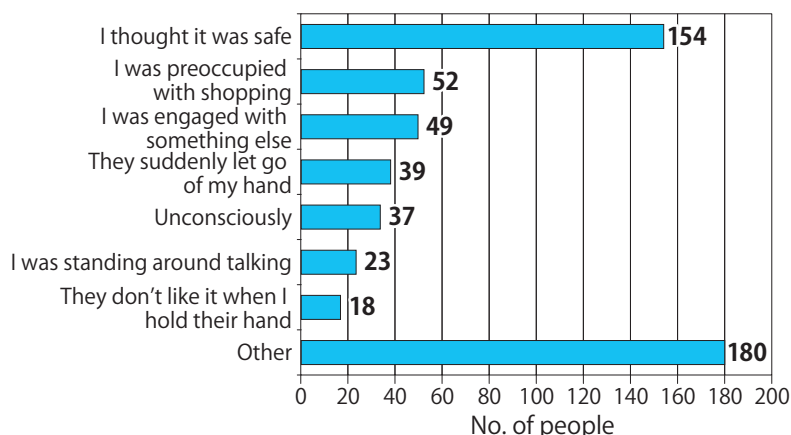


Fig. 8. Breakdown of reasons for not holding hands with the child (2010 – 2014)

■ In what ways are four-wheeled vehicles moving when they get into accidents with pedestrians?

Fig. 9 shows the type of motion of the opposing vehicle by age group of the pedestrians that were killed or injured in pedestrian–four-wheeled vehicle accidents in parking lots and similar locations. Children aged 6 or under and 7 – 12 tend to suffer collisions when the vehicle is starting up or moving straight, while people aged 65 or over tend to suffer collisions when the four-wheeled vehicle is reversing.

Generally speaking, many of the accidents that occur while young and school-age children are walking are caused by the children darting out, and so is the case with parking lots and similar locations, where the children dart out from the shadows of the parked vehicles. This is also believed to be due to the fact that children that are short in stature tend to be concealed by parked vehicles, making it difficult for the drivers of four-wheeled vehicles to notice their presence. Another reason for this is because parked vehicles and other objects restrict the children's visual field, making it difficult for them to notice four-wheeled vehicles.

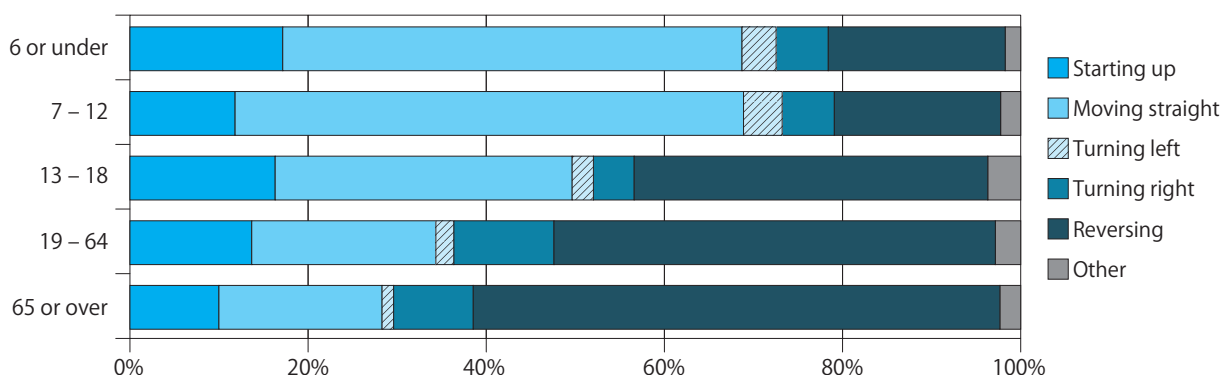


Fig. 9 Type of motion of the opposing vehicle by pedestrian age group (2010 – 2014)

■ Summary of the characteristics of pedestrian–four-wheeled vehicle accidents in parking lots and similar locations

The following characteristics were observed with the pedestrians who were killed or injured.

◆ Age 65 or over

- The casualties are increasing year by year.
- They tend to get into accidents when the four-wheeled vehicle is reversing.
- They frequently get into accidents because they fail to properly confirm safety factors.

◆ Age 6 or under

- They tend to get into accidents when the four-wheeled vehicle is starting up or moving straight.
- Oftentimes their parent or guardian is not holding their hand.
- Their percentage of fatalities or serious injuries in parking lots and similar locations is roughly the same as in all other locations.

3 Typical examples of accidents

This section will introduce one example of an accident each for cases where the pedestrian is 65 or over and 6 or under, as symbolized by the survey results for the macro-data.

■ Example of an accident involving elderly people

As Driver A was backing up in a parking lot under the impression that there were no pedestrians behind him, he failed to confirm safety behind his vehicle to the left and right and reversed out of a parking spot at a speed of roughly 10km/h. He collided with Pedestrian B, who he was unaware was approaching his vehicle from behind him on the left side. Since Pedestrian B was walking with her head down, she failed to recognize the fact that the four-wheeled vehicle driven by A was backing up, and collided with the said four-wheeled vehicle.

The fact that Driver A failed to adequately confirm the safety factors behind him is believed to be the primary cause of the accident, but Pedestrian B's behavior is also a factor. Walking through parking lots without considering that parked vehicles may be backing up towards you, not paying attention to the conditions around you, and walking while looking down are also factors that cause accidents.

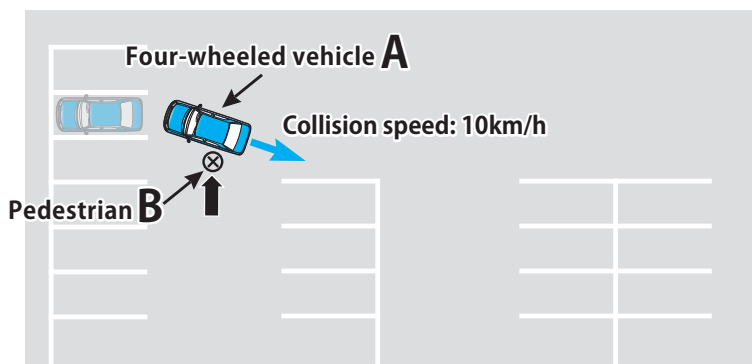


Fig. 10. Diagram of the scene of the accident

Time / timeframe of accident:

9:00 – 10:00 in March on a clear day

Four-wheeled vehicle A:

Man in his early 80s

Pedestrian B:

Woman in her early 60s, sustained slight injuries

■ Example of an accident involving a young child

Having finished her shopping, Driver A pulled out of her parking spot and drove towards the shop's rear exit. She collided with Pedestrian B, who suddenly darted out from the shadow of a car parked on the right side in the direction she was moving, running him over with her right, rear wheel. Driver A did not notice when Pedestrian B came out of the shadow of the parked car. When she heard a thump sound on the right side of her vehicle the driver stopped immediately. It was only after she got out of the driver's seat on the left side and came around to the right side of the vehicle that she saw Pedestrian B's mother cradling Pedestrian B in her arms and realized that she had run over Pedestrian B.

Since it was a parking lot for a store that handles goods for young children, one would expect young children to be walking freely through the parking lot and emerging from the shadows of vehicles. Driver A needed to be driving with an awareness of this fact. In addition, Pedestrian B's mother parked her car in a parking space and took Pedestrian B down from his child seat in the back seat on the vehicle's left-hand side. When she went to take his hand, Pedestrian B immediately withdrew his hand from hers and began walking on his own. The fact that Pedestrian B's mother did not firmly take hold of his hand is another factor behind the accident.

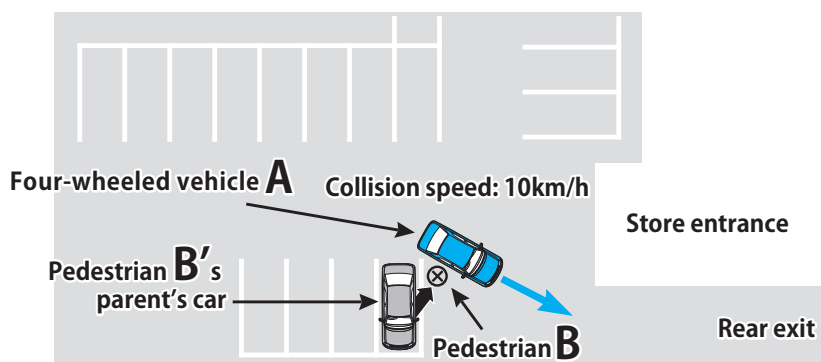


Fig. 11. Diagram of the scene of the accident

Time / timeframe of accident:

10:00 – 11:00 in October on a clear day

Four-wheeled vehicle A:

Woman in her early 20s

Pedestrian B:

2-year old boy, sustained serious injuries

4 Conclusion

Below we have summarized precautions to pay attention to when walking and driving through parking lots.

■For elderly people using parking lots

When walking through parking lots, take heed of your surroundings in the same manner as you would when walking along sidewalks and roadways. Don't assume that because it is a parking lot it is safe, and always be cautious of the movement of vehicles. Especially when four-wheeled vehicles are backing up there are numerous blind spots behind the vehicle, which make it difficult for the driver to accurately determine and confirm the conditions behind their vehicle. Therefore, while you may think that the driver is aware of your presence, or is driving by anticipating the manner in which you are moving, you should walk while being mindful of the movement of four-wheeled vehicles.

■For parents using parking lots accompanied by young children

The behavior of young children is unpredictable. If there is something that catches their interest, they have a tendency to suddenly rush out towards it without noticing anything else. Parents should firmly take hold of young children's hands in parking lots and not let them walk around freely as they please. Moreover, as was referenced in the accident case example, parents must also be attentive immediately after their young children get out of the car. Sometimes children can get away from their parents in the blink of an eye. Parents should be careful to ensure that when young children exit the vehicle they do not get separated when the parent is putting things in order in the vehicle or closing their door.

■For people driving in parking lots

Since people drive at relatively low speeds when driving in parking lots, this potentially makes them more careless than when they are driving on general roads. Furthermore, people also potentially get careless about confirming safety factors in front of them when searching for a parking space. Parking lots have lots of blind spots and cars frequently back up in parking lots, resulting in numerous cases where it is impossible to accurately determine the surrounding conditions.

Drivers must pay attention to children in particular when they are starting their vehicle up and moving straight. Since children are small in stature they tend to be concealed in the shadows of parked vehicles, making it difficult for drivers to notice and delaying detection. Therefore, drivers must make an effort to drive at a speed where they can stop at any time (10km/h or slower).

When backing up, it is difficult for drivers to accurately determine or confirm the conditions behind them. They should back up at about the same speed at which pedestrians walk. When passengers are present, drivers should get the passengers to guide them out.

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