



FINAL REPORT

2006-0033-5 RAILWAY ACCIDENT

**Between Csajág and Balatonkenese stations
at level crossing no. AS380**

15 July 2006

The sole objective of the technical investigation is to reveal the causes and circumstances of serious railway accidents, accidents and incidents and to initiate the necessary technical measures and make recommendations in order to prevent similar cases in the future. It is not the purpose of this activity to apportion blame or liability.

This present investigation was carried out on the basis of

- Act CLXXXIV of 2005 on the technical investigation of aviation, railway and marine accidents and incidents (hereinafter referred to as Kbv.),
- In absence of other related regulation of the Kbv., the Transportation Safety Bureau of Hungary carried out the investigation in accordance with Act CXL of 2004 on the general rules of administrative authority procedure and service,
- MET Decree 7/2006. (II. 27.) on the regulations of the technical investigation of serious railway accidents, railway accidents and incidents.
- The Kbv. and the MET Decree 7/2006. (II. 27.) jointly serve the compliance with the following EU acts:
Directive 2004/49/EC of the European Parliament and of the Council of 29 April 2004 on safety on the Community's railways and amending Council Directive 95/18/EC on the licensing of railway undertakings and Directive 2001/14/EC on the allocation of railway infrastructure capacity and the levying of charges for the use of railway infrastructure and safety certification (Railway Safety Directive)
- The competence of the Transportation Safety Bureau of Hungary is based on the Kbv. until 31st December 2006 and on Government Decree 278/2006 (XII. 23.) from 1st January 2007 respectively.

Under the aforementioned regulations

- The Transportation Safety Bureau of Hungary shall investigate serious railway accidents.
- The Transportation Safety Bureau of Hungary may investigate railway accidents and incidents which - in its judgement - would have resulted in serious accidents in other circumstances.
- The technical investigation is independent of any administrative, infringement or criminal procedures.

This present final report

was based on the draft report prepared by the IC and accepted by the Director-General of TSB. The draft report was sent to the relevant parties - defined by law - for reflections. At the same time, the relevant parties and organisations were also informed and invited to the closing discussion of the draft report.

The following organisations were represented at the closing discussion which was held on 8th April 2008:

- National Transport Authority,
- MÁV Zrt. Infrastructure Management - Telecommunication, Heavy Current and Signal Box Department

The IC has not received any reflections, supplements or opinions different from the findings of the technical investigation.

In the course of the procedure, the IC

- conducted the necessary investigations and took measures in order to fulfil the objectives of the technical investigation within reasonable time,
- examined the site of the occurrence, the railway infrastructure, the railway vehicles and their accessories, and the damages,
- interviewed the persons in possession of relevant information,
- received all relevant information and records.

The parties concerned cooperated in conducting the technical investigation.

Incompatibility did not stand against the members of the IC.

The members of the IC performed their tasks under the control of the Investigator-in-charge.

Persons participating in the technical investigation did not act as experts in other procedures concerning the same case and shall not do so in the future.

Abbreviations

BIG	Safety Directorate (of MÁV Zrt.)
CSM	Engine driver on duty on his own in the driver's cab (CS ak Mozdonyvezető = "Engine driver only")
„C” examination	Recurrent examination on the basis of kilometres run or that of performance
D 55	Domino 55 type signal box
D, DT	Diesel locomotive, diesel shunting locomotive
EVM 120	Electronic train control installation
MET (GKM)	Ministry of Economy and Transport (Gazdasági és Közlekedési Minisztérium)
TSB	Transportation Safety Bureau
Kbvt.	Act CLXXXIV of 2005 on the technical investigation of aviation, railway and marine accidents and incidents
KJK	MÁV Zrt. Mechanical Engineering Branch, Regional Vehicle Maintenance Centre
KM	Ministry of Transport (predecessor of Ministry of Economy and Transport) (Közlekedési Minisztérium)
LED	Light emitting diode
MÁV- START Zrt.	Passenger Rail-transport Plc. (MÁV-START Vasúti Személyszállító Zrt.)
MÁV Zrt.	Hungarian State Railways Plc. (Magyar Államvasutak Zártkörűen Működő Részvénytársaság)
Daily examination	Cycle-time: 96 hours ± 12 hours
NTA	National Transport Authority
STM	Non-volatile memory (part of TEL 1000)
STRAIL	Rubber plate at level crossing or at pedestrian crossing
IC	Investigating Committee
TEBF	MÁV Zrt. Infrastructure Management - Telecommunication, Heavy Current and Signal Box Department
TEL 1000	Electronic data recorder manufactured by Sécheron Factory
VBO	The competent Regional Railway Safety Department of BIG MÁV Zrt.
V, VT	Electric locomotive, electric shunting locomotive

SUMMARY

Reports and notifications

The head of traffic operations control of MÁV Zrt. reported the occurrence to the TSB duty services at 10 hours 34 minutes on 15th July 2006.

The on duty personnel of TSB reported the occurrence to TSB's head of department on duty at 10 hours 36 minutes on 15th July 2006.

The appointment of the Investigating Committee

The Director-General of TSB appointed the following Investigating Committee (hereinafter referred to as IC) to investigate the railway accident:

Investigator-in-charge	Iván Lócsi	accident investigator
Members of the IC	András Mihály	accident investigator (substituting István Simon)
	Ferenc Pataki	field investigator technician

The IC membership of István Simon terminated on 31st December 2006, since then he is no longer the civil servant of TSB. To substitute him, the Director-General of TSB appointed András Mihály as a member of the IC.

Time of the accident

10 hours 9 minutes on 15th July 2006.

Classification of the occurrence

Legal basis of the investigation: 19. § (2) b) of Directive 2004/49/EC
7. § (1) b) of Act CLXXXIV of 2005 (Kbvt.)
3. § (1) a) of 7/2006. (II. 27.) MET Decree

Type of railway system: national

Type of main occurrence: significant railway accident

Character: accident at level crossing

Type of secondary occurrence: n. a.

Character: n. a.

Type of movement: long distance passenger train

Location: open track / level crossing

Injuries:

	<i>Fatal</i>	<i>Serious</i>	<i>Minor</i>	<i>None</i>
<i>Passengers</i>				<input checked="" type="checkbox"/>
<i>Railway staff</i>				<input checked="" type="checkbox"/>
<i>LC users</i>	1	1	0	<input type="checkbox"/>
<i>Trespassers</i>				<input checked="" type="checkbox"/>
<i>Others</i>				<input checked="" type="checkbox"/>

Infrastructure manager: MÁV Zrt.

Operator: MÁV Zrt.

Location of the accident

Railway line no. 29. Székesfehérvár – Tapolca

Level crossing no. AS380 between Csajág and Balatonkenese stations (See Figures 1 and 2).

Competent investigating authority (according to the location of the accident)

Transportation Safety Bureau

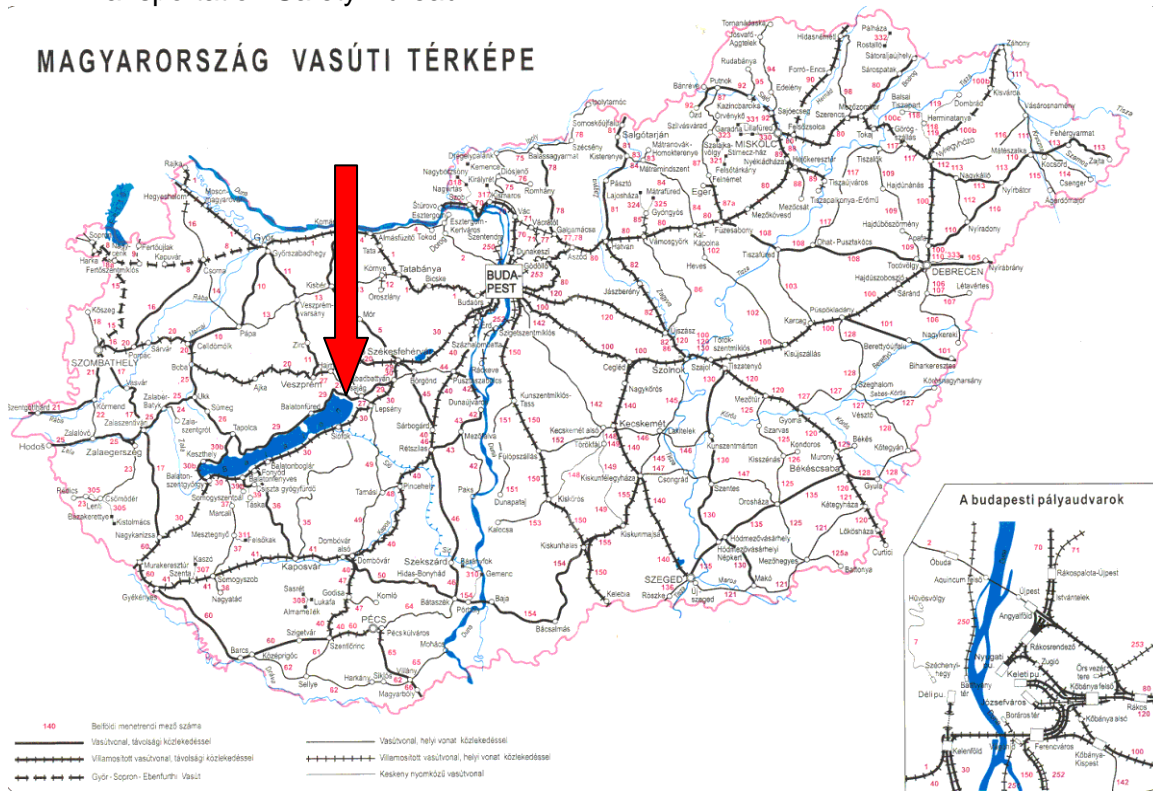


Figure 1: The location of the accident on the railway map of Hungary



Figure 2: Location of level crossing no. AS380 secured with warning lights

1. Factual information

1.1 Course of the event

Locomotive (registration number M41-2311) of passenger train no. 1972 running from Budapest-Déli station (Budapest Southern Railway Station) to Balatonfüred collided with a Ford Fiesta type car at 10 hours 09 minutes on 15th July 2006 between Csajág and Balatonkenese stations in railway section no. 380+29, at level crossing no. AS380 secured with warning lights giving stop signal towards the road. Following the collision, the train pushed the car in front of itself on a 209.9 metre distance. After the train had stopped, the spilling fuel in the engine compartment of the car ignited. The engine driver and the arriving police extinguished the fire with a fire extinguisher. As a consequence of the collision, the pregnant woman sitting on the front right seat died of her injuries. The driver of the car suffered serious, perilous skull injuries and was taken to Veszprém County Hospital by an ambulance helicopter.

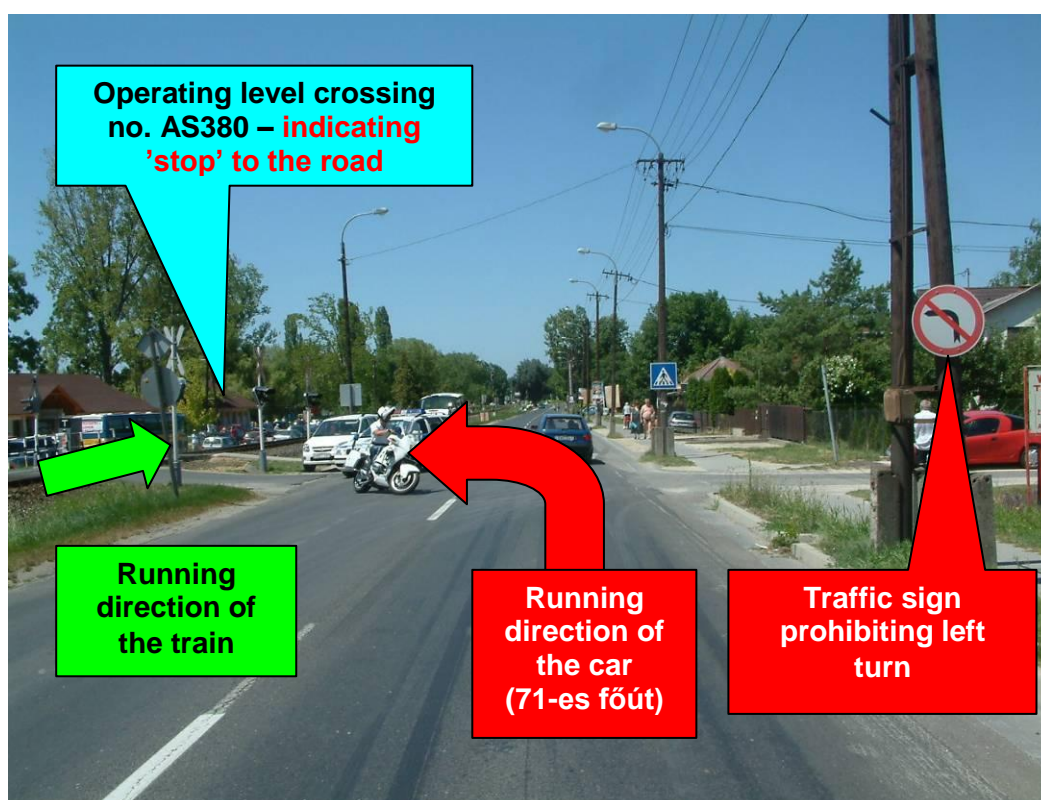


Figure 3: Traffic situation prior to the accident

1.2 Injuries to persons

Injuries	Staff	Passengers	LC users	Others
Fatal	-	-	1	-
Serious	-	-	1	-
Minor	-	-	-	-

1.3 Damage to road vehicle involved in the accident

The Ford Fiesta car was written off (See Figure 17).

1.4 Damage to railway vehicles

- **Diesel locomotive (registration number M41-2311) of passenger train no. 1972 of MÁV Zrt.** became unserviceable (See Figure 4), its Ackermann pneumatic switch broke off, its main brake cylinder sustained damage and its deflector bent.
- According to MÁV Zrt. BIG Regional VBO (Szombathely city), the repair of the locomotive cost 160.000 HUF. The repairs were carried out by KJK.



Figure 4: The unserviceable locomotive

1.5 Damage to infrastructure

- According to VBO Szombathely, the railway track was not damaged. However, the shifted STRAIL plate of the pedestrian crossing had to be set back. (See Figure 5).
- The service of the signal box specialists cost 14 086 HUF.
- Although the engine oil and the fuel spilt from the car to the railway embankment, it did not cause significant damage, therefore it was not necessary to indemnify damages.

The IC did not receive any information about further damage by the completion of the investigation.

The IC did not receive information on the final amount of the damages by the completion of the final report.

1.6 Damage to the property of third-party

The paintwork of a Renault car coming from the direction of Balatonfűzfő to Balatonakarattya on main road no. 71 was slightly damaged (on the top of the engine compartment, on the front right door and on the rear right fender) as a

result of stones scattered from the railway embankment to main road no. 71. According to the police, the damage to this car amounted to approximately 100.000 HUF.



Figure 5: The slightly shifted STRAIL plate at the pedestrian crossing



Figure 6: The engine-oil and fuel spilt from the car to the ballast.

1.7 Personnel information

Engine driver of train no. 1972

- 49-year-old man
- Issue of driving licence: 14 September 2001
- Driving licence valid: 15 September 2007
- Licence valid for the following type of vehicles: V, VT, D, DT,
- Beginning and location of his duty on 15 July 2006: 04 hours 30 minutes, Tapolca.

1.8 Train information

Train number	1972
Train type	passenger train
Type of traction	CSM
Departure station	Budapest-Déli pu.
Destination station	Balatonfüred
Registration number of locomotive	M41-2311
Owner of locomotive	MÁV Zrt.
Owner of carriages	MÁV Zrt.
Number of carriages	8
Length of train	192 m
Tonnage	321 t
Prescribed braked weight percentage	69%
Actual braked weight percentage	100%
Type of braking	express train pneumatic brake
Permitted speed	80/80 km/h

1.9 Characteristics of the locomotive

Type of locomotive	M41 series diesel locomotive
Registration number of locomotive	2311
Wheel diameter	1040 mm
Type of tachometer and data recorder	TEL 1000
Position of odometer	171 660 kms
Hours of operation	5376
Position of goods-passenger braking system	passenger
Type of brake valve	PBL3-98
Date of „C” examination	5 May 2005
Location of „C” examination	Szolnok Repair Yard
Time of last daily examination	9 May 2006, between 21:00 and 22:00
Location of daily examination	Székesfehérvár KJK
Accumulated operation time since last examination	60 hours

1.10 Meteorological information

At the time of the accident, the weather was calm and clear with 25°C degrees outside temperature and normal visibility (normal daylight conditions).

The meteorological conditions had no influence on the accident.

1.11 Description of rail track and level crossing no. AS380

The rail track

The structure of the rail track is of 48 kg per linear metre rail fitted on reinforced-concrete sleepers in ballast chips.

The permitted speed on the rail track was 80 km/h at the time of the accident.

The permitted general braking distance on the line is 700 metres.

The rail track runs parallel with main road no. 71 from Balatonakarattya to Balatonfűzfő. The rail track runs straight from section no. 377 to and beyond the site of the accident (section no. 380+29) until section no. 384 in the direction of Balatonkenese station.

The rail track lies on a 1,2 ‰ slope (from the start point – Csajág direction) from section 362+03 to section 382+50, and it is level between sections 382+50 and 385+00.

Level crossing no. AS380 is in Balatonkenese (downtown).

The level crossing is covered with asphalt and the road which runs through the level crossing (Vak-Bottyán utca) is also asphalted with no signs on the road surface.

Maintainer of road: Local Government of Balatonkenese.

The width of the road is: 6.40 metres.

The crossing angle of the road and the rail track is 90°.

The centre of the track is 7.42 metres from the edge of main road no. 71 (Balatoni út).

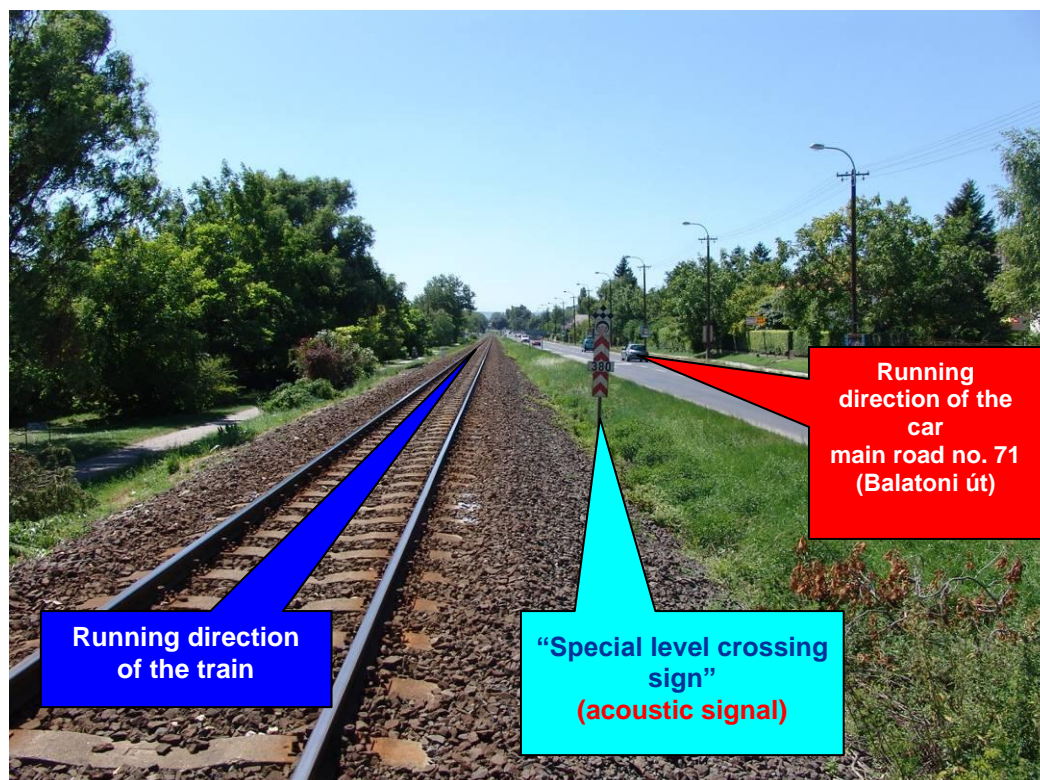


Figure 7: The “special level crossing sign” on the right side of the rail track

There is a “special level crossing sign” in the start point direction (Csajág), at section no. 376+28 on the right side of the rail track before the level crossing (see Figure 7).

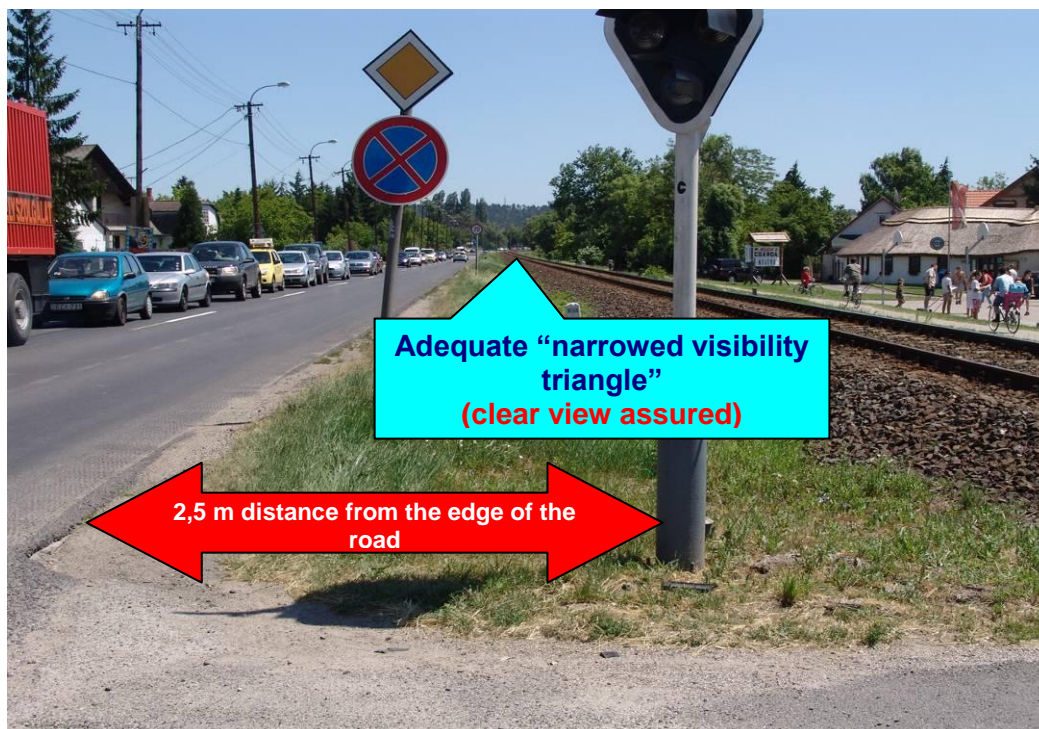


Figure 8: Narrowed visibility triangle

The visibility (so called “narrowed visibility triangle” - $L_v=400$ m) was assured – in compliance with 26.4 of KM Decree of 20/1984 (XII. 21.) – on the right side of the rail track in the direction of Csajág. The rail track is visible for over 400 metres length in the direction of Csajág from a 1 metre distance measured from the centre of the road which runs across the LC (See Figure 8).

Level crossing (hereinafter referred to as LC) no. AS380

LC no. AS380 is situated in the section between Csajág and Balatonkenese stations.

LC no. AS380 is fitted with automatic warning lights controlled by the train (intermittent automatic train-running control). When the train reaches the triggering sensor at the so called “entry point” (13 kHz track circuit) the warning lights turn to red and when leaving the LC at the so called “exit point” sensor (13 kHz track circuit), the warning lights turn back to white signalling.

The positions (operation) of the warning lights are indicated on the control panel of D55 type signal box in the traffic office of Balatonkenese station where possible operational irregularities or failures of the warning lights are immediately indicated by both visual and acoustic signals, warning the movements inspector of such events.

LC no. AS380 is equipped with three **warning lights**. Two warning lights - “a” and “c” - from the direction of main road no. 71 (Balatoni út, Balatonkenese town) and one - “b” - from the direction of Lake Balaton.

“a” and “c” warning lights are 2.5 metres from main road no. 71 (See Figure 8).

Warning light “a” is perpendicular to the LC, set in the direction of Vörösmarty tér (which is on the other side of main road no. 71 (Balatoni út) (See Figure 9).



Figure 9: LC no. AS380, turning possibilities from the direction of Vörösmatry tér



Figure 10: LC no. AS380, turning possibilities from main road no. 71 (Balatoni út) from the direction of Balatonkenese downtown

Warning light "c" is set towards vehicles arriving at the LC from main road no. 71 (Balatoni út) from the direction of Balatonkenese downtown (See Figure 10).

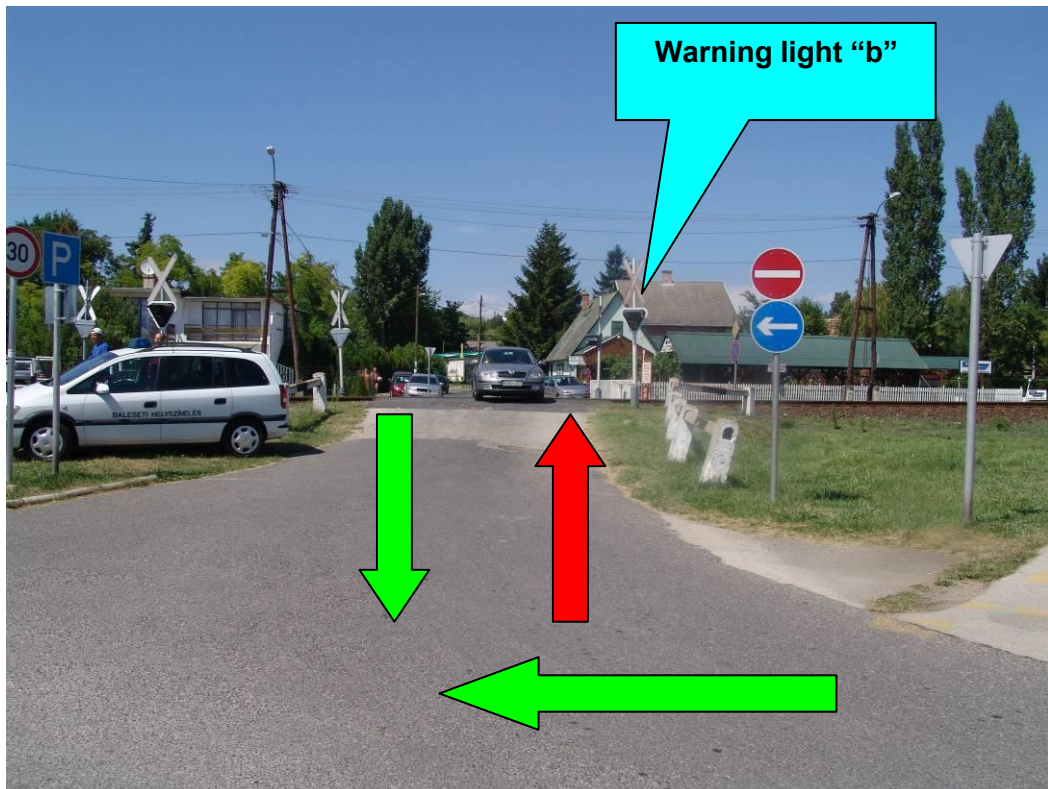


Figure 11: LC no. AS380 from the direction of Lake Balaton



Figure 12: LC no. AS380 on Balatoni út from the direction of Balatonakarattya

Warning light "b" is perpendicular to the rail track and is set in the direction of Lake Balaton from where there is a "No Entry" traffic sign prohibiting the left turn

towards the LC (See Figure 11). However, there is no sign from the direction of main road no. 71, which would indicate that there is one-way traffic through the LC in the direction of Lake Balaton.

There is no warning light on Balatoni út in the direction of vehicles arriving from Balatonakarattya as a “No Left Turn” traffic sign prohibits the entry to the LC (See Figure 12).

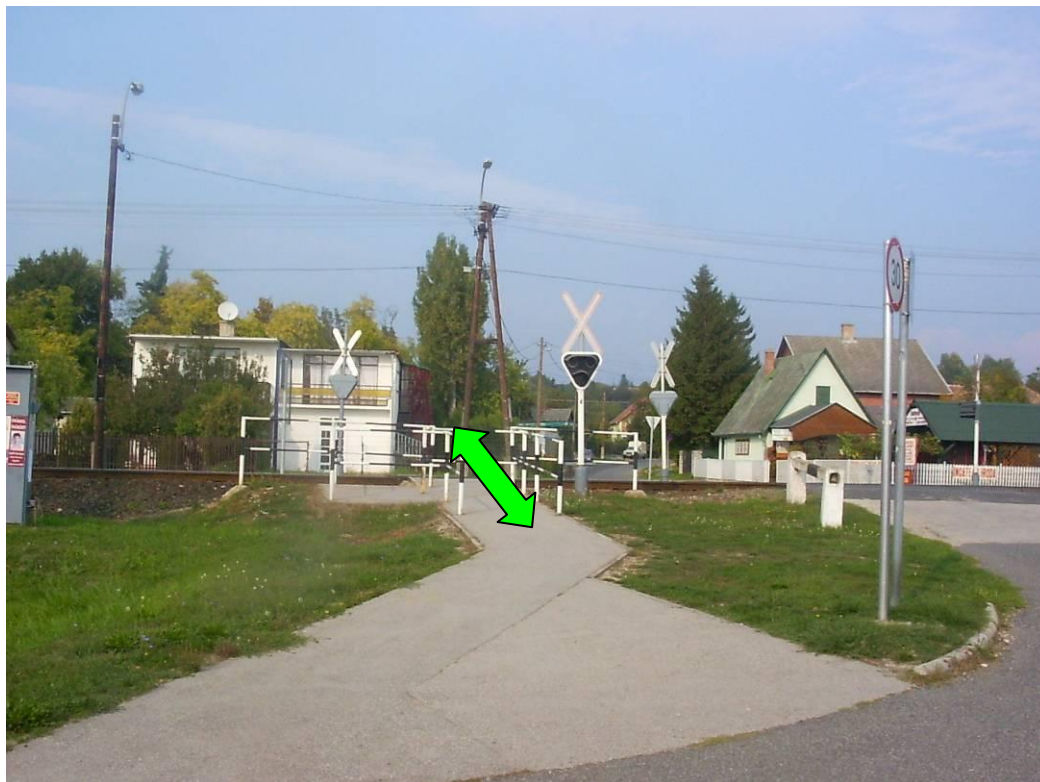


Figure 13: Pedestrian crossing equipped with warning lights

Next to LC no. AS380 (in the direction of Balatonkenese station), there is a pedestrian crossing secured with warning lights and so called ‘labyrinth barriers’, and the crossing is paved with STRAIL plates (See Figure 13).

Due to their construction, the warning lights do not have a built-in system for registering operations.

1.12 Communications

Communications equipment had no effect on the accident, therefore their detailed description is not required.

1.13 Station information

The characteristics of Csajág and Balatonkenese stations had no effect on the accident, therefore their detailed description is not required.

1.14 Data recorders of trains

On diesel locomotive (registration number M41-2311) of train no. 1972 a TEL 1000 type electronic tachometer and data recorder was in operation.

At the time of the accident, the built-in clock of the tachometer showed the correct time (it was exact).

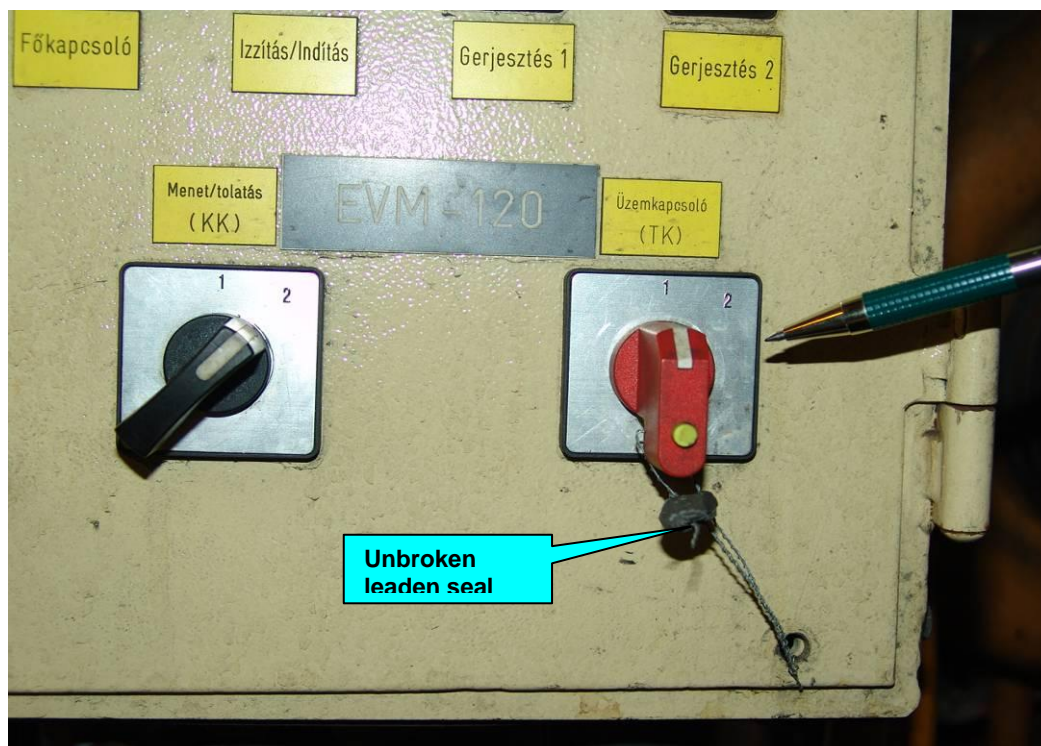


Figure 14: EVM 120 handle fitted with an unbroken leaden seal

The EVM 120 handle was sealed adequately (See Figure 14).



Figure 15: The driver's cab of the locomotive (registration no. M41-2311)

1.15 Tests and research

After the rail track had been cleared, the IC checked the operation of the warning lights at LC no. AS380 as well as its signals on the signal box in the traffic office with several subsequent trains running on the track. The IC established that the warning lights operated normally and faultlessly at all trains running on the given section of the track and that the signals on the control

panel of the signal box were in accordance with the operation of the warning lights at all times.

On 24th June 2007, the IC recorded on VHS and on photographs (See Figure 16) that several cars coming from the direction of Balatonakarattya turned left and drove through LC no. AS380 regardless of the "No left turn" traffic sign (on 12 occasions in 30 minutes). On one occasion, a car turned left and drove past warning light "a" when the driver realised that a train was coming from the direction of Balatonakarattya. He then stopped and quickly reversed back to main road no. 71 where he nearly crashed into a car coming from the direction of Balatonkenese. (The driver had noticed the red "Stop" signal of the warning lights only in the last minute before the train ran through the LC as there is no opposite warning light in the direction of Balatonakarattya). On five occasions, cars drove onto main road no. 71 from the direction of Lake Balaton through the LC ignoring the "No entry" traffic sign.



Figure 16: A car turning left regardless of the "No left turn" traffic sign

1.16 Organisational and management information

The required rest time was provided for the engine driver of passenger train no. 1972 prior to his shift.

The engine driver knew the railway line well.

The driver's cab of the diesel locomotive (registration no. M41-2311) is well designed (in ergonomic aspects); it did not hinder the engine driver from seeing LC AS380.

1.17 Additional information

Four similar accidents occurred at LC no. AS380. in the space of almost a year.

1st occurrence (field investigation was not conducted)

Passenger train no. 974 running from Budapest-Déli station to Tapolca collided with a BMW type car at 14 hours 20 minutes on 11th July 2006 between Csajág and Balatonkenese stations at level crossing no. AS380 secured by warning lights (operating normally). The car was turning left from main road no. 71 (Balatoni út) from the direction of Balatonakarattya onto the LC, ignoring the “No left turn” traffic sign. No one was injured in the accident.

2nd occurrence (this present investigation)

Passenger train no. 1972 running from Budapest-Déli station (Budapest Southern Railway Station) to Balatonfüred collided with a Ford Fiesta type car at 10 hours 09 minutes on 15th July 2006 between Csajág and Balatonkenese stations at level crossing no. AS380 secured by warning lights (operating normally) giving stop signal towards the road. The car was turning left from main road no. 71 (Balatoni út) from the direction of Balatonakarattya onto the LC, ignoring the “No left turn” traffic sign. As a consequence of the collision, one of the two persons sitting in the car died at the site of the accident, the other suffered serious perilous injuries (See Figure 17).

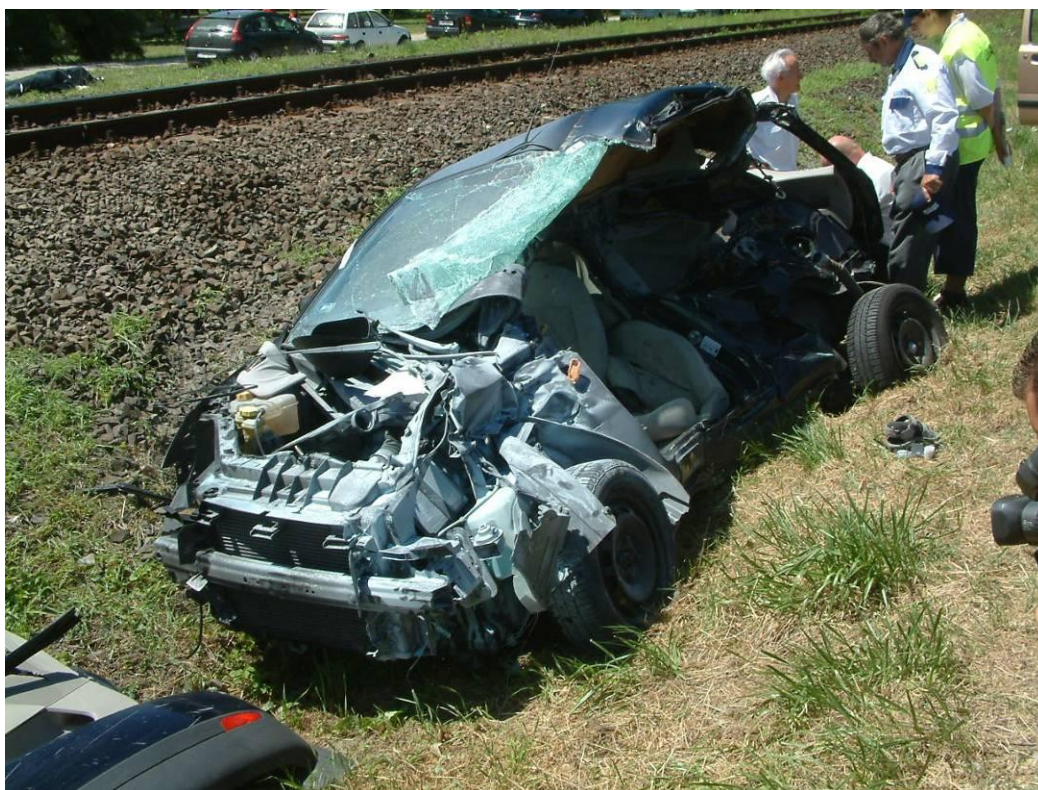


Figure 17: Collision involving train no. 1972 and a car occurred on 15th July 2006

3rd occurrence (field investigation was conducted)

Non-scheduled passenger train no. 13972 collided with an Opel Corsa type car at 11 hours 18 minutes on 9th September 2006 between Csajág and Balatonkenese stations at level crossing no. AS380 secured by warning lights (operating normally). The car was turning left from main road no. 71 (Balatoni út) from the direction of Balatonakarattya onto the LC, ignoring the “No left turn” traffic sign. As a consequence of the collision, one of the four persons sitting in the car suffered serious injuries while the other three persons suffered minor injuries (See Figure 18).



Figure 18: Collision involving train no. 13972 and a car occurred on 9th September 2006

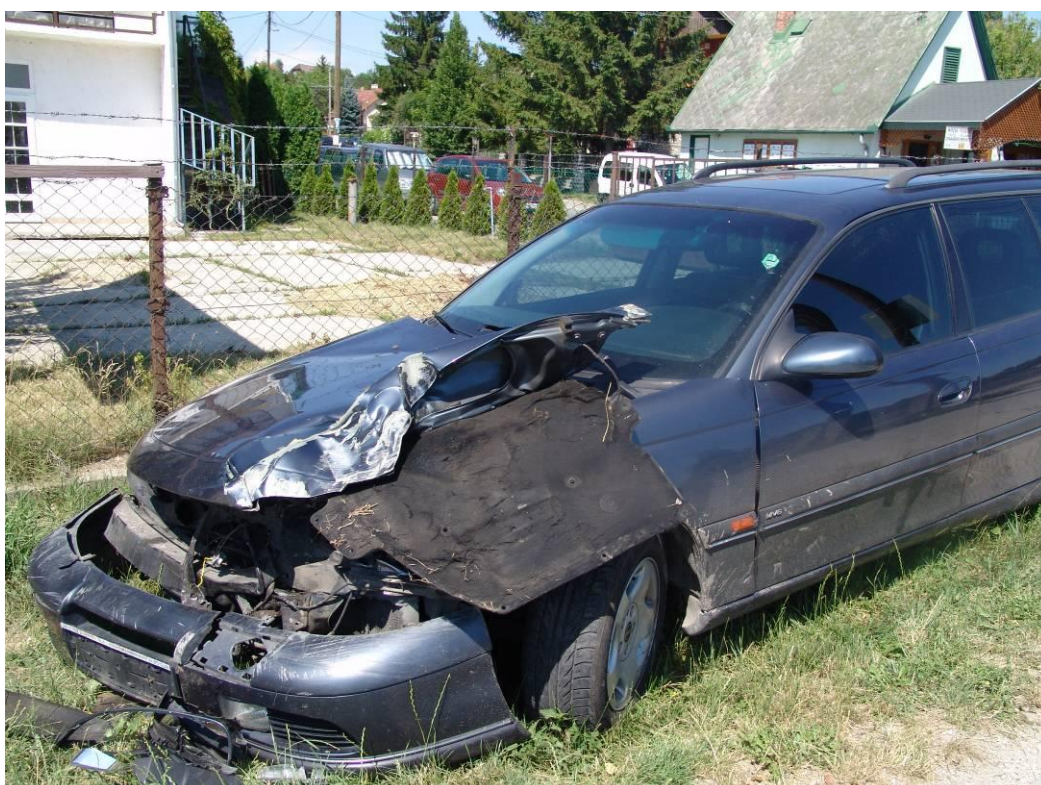


Figure 19: Collision involving train no. 16909-2 and a car occurred on 24th June 2007

4th occurrence: (field investigation was conducted)

Train no. 16909-2 running from Székesfehérvár to Tapolca collided with an Opel Omega type car at 11 hours 43 minutes on 24th June 2007 between Csajág and Balatonkenese stations at level crossing no. AS380 secured by warning lights (operating normally). The car was turning left from main road no. 71 (Balatoni út) from the direction of Balatonakarattya onto the LC, ignoring the “No left turn” traffic sign. No one was injured in the accident (See Figure 19).

2. Analysis

By the time the IC arrived at the site of the accident (at 12 hours 30 minutes), the deceased passenger and the seriously injured driver of the car as well as the eight carriages of train no. 1972 had been taken away from the site. The damaged car had also been removed from the rail track. After the completion of the site survey of the police, train no 1972 was running in a very slow pace to Balatonkenese station where the damaged locomotive (registration no. M41-2311) was replaced by another locomotive and the train afterwards continued its normal service (at 12 hours 30 minutes). The IC found the unserviceable locomotive (M41-2311) at Balatonkenese station. By this time, traffic had been restored on the line and trains had been running normally on the cleared rail track.

Based on the evaluation of the data stored by TEL 1000 data recorder, the IC has established the following:

- According to the ‘instruction’ of the “Special level crossing sign”, the engine driver hooted a “**Warning!**” acoustic signal 361 metres from the LC at 10 hours 08 minutes 37 seconds.
- The speed of the train prior to emergency braking was: 79 km/h.
- According to the recordings of TEL 1000, the train control installation picked up a so called “**Vmax**” signal from the rail track. Thus by this time, entry signal “A” of Balatonkenese station indicated “Line clear” (open position) to train no. 1972.
- The engine driver noticed the car turning onto the LC at 10 hours 08 minutes 52 seconds (including 1 sec. reaction time).
- Distance run during reaction time: approximately 22 metres with 79 km/h speed.
- Time of commencement of emergency braking: 10 hours 08 minutes 53 seconds.
- Place of commencement of emergency braking: 27 metres from the location of the collision.
- Distance run until braking effect was reached: 65 metres.
- Distance run from the time the engine driver noticed the car until the collision: approximately 49 metres. Thus, braking effect was not yet reached at the time of the collision.
- Time of the collision: 10 hours 08 minutes 54 seconds.
- Speed of the train at the time of the collision: 79 km/h.
- Distance run from the commencement of emergency braking until stopping: 317 metres.
- Distance run from the site of the collision to the site where the train stopped: 290,9 metres.
- Time of reaching braking effect (commencement of deceleration): 10 hours 08 minutes 56 seconds.
- At 10 hours 08 minutes 56 seconds (when braking effect was reached), the TEL 1000 registered a ‘no signal’ digital message which did not change even when the train departed towards Balatonkenese station.
- Distance run from the commencement of deceleration to stopping: 252 metres. According to this fact, the average value of deceleration was 0.9–1 m/sec², which is normal for these types of trains. The contact and friction of the car -

being across in front of the locomotive - with the rail track (pair of rails and basalt) slightly increased the deceleration.

- Time of stopping: 10 hours 09 minutes 16 seconds.
Having passed and switched "A" entry signal of Balatonkenese station back to Stop position (red lights), the train stopped.
The LC and its warning lights operated normally and faultlessly in the course of the occurrence. After the train had passed through the LC - that is, when the last pair of wheels left the sensor (13 kHz track circuit) – the warning lights automatically switched to 'flashing white' signal towards the road.

The LC and its warning lights were in compliance with the regulations of the authorities and were distinctly visible from the road.
- The placing of the road traffic signs were in compliance with the regulations.
Prior to the accident, the technical condition of locomotive M41-2311 was satisfactory and in compliance with the transport safety regulations.
The engine driver was qualified and authorized to drive the locomotive. He acted satisfactorily and performed the prescribed tasks in the course of the accident.
The engine driver did not exceed the 80 km/h speed limit for the line and the train.
The engine driver said that he had immediately pressed the emergency signal button which started the emergency braking (Figure 15).
- The brake system of the locomotive worked well.
The result of the breathalyser test on the engine driver done by the police was negative.
The two eyewitnesses interviewed by the police also saw that the car turned left and drove onto the LC regardless of the Stop signal of the warning lights.
The movements inspector at Balatonkenese did not find any circumstance on the signals of the control panel that would have disturbed or interfered into the operation of the LC at the time of the occurrence.
There was no entry in the error log of Balatonkenese station regarding errors of LC AS380.
The position of the counter of LC AS380 on the control panel of Domino 55 at Balatonkenese station did not change.

3. Conclusions

3.1 Wrong procedures and measures

On all four above mentioned occasions, the damaged cars were driving on main road no. 71 from the direction of Balatonakarattya towards Balatonkenese then they turned left onto the LC regardless of the **“No left turn”** traffic sign. LC no. AS380 and its warning lights were operating normally in all cases (they indicated Stop signal – flashing red lights – towards the road).

Direct cause of the occurrence of the accident:

- Non-compliance with the regulations of the Highway Code (KRESZ in Hungarian).

3.2 Additional remarks

No. SR2 LC (secured with warning lights and half barrier) of Balatonkenese station located approximately 500 metres from LC no. AS380 in the direction of Balatonkenese is a considerably safer LC as there are turning lanes and acceleration lanes leading to the LC (See Figures 20, 21 and 22).

There is another LC (no. AS373) in the inner-town area of Balatonkenese approximately 700 metres from LC no. AS380 in the direction of Balatonakarattya with a connecting turning lane, which is also a safer LC (See Figure 23).

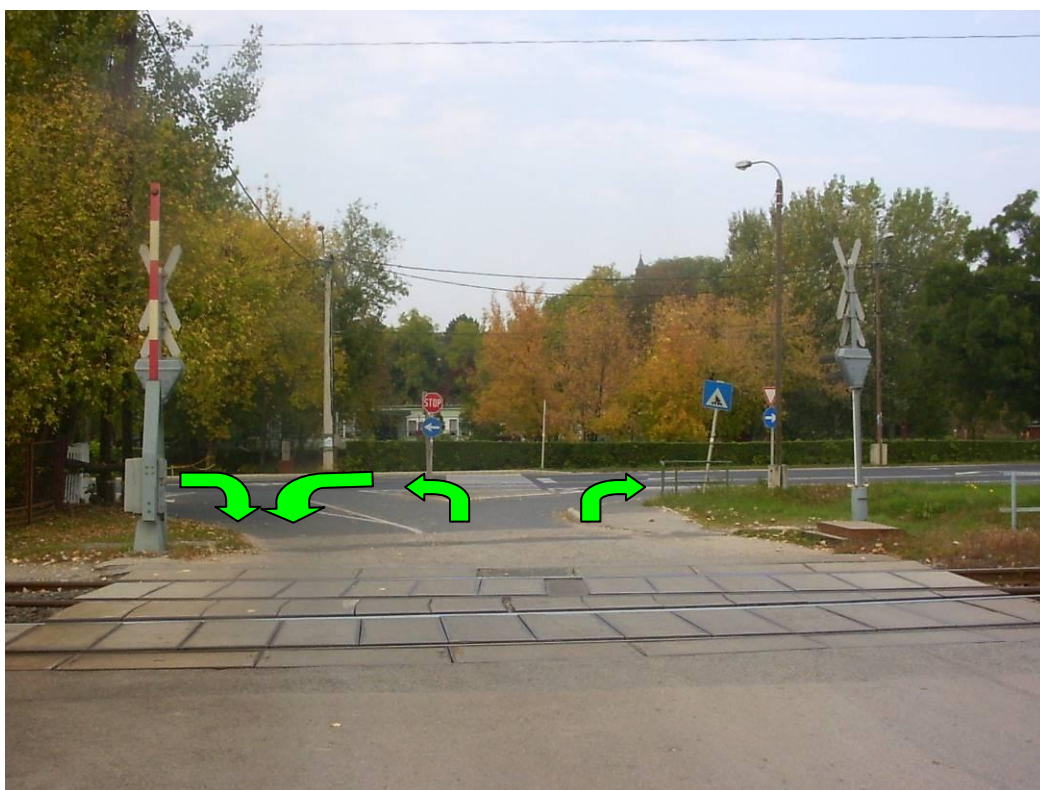


Figure 20: LC no. SR2 of Balatonkenese station connecting to main road no. 71



Figure 21: Turning lanes at LC SR2 on main road no. 71 in the direction of Balatonakarattya

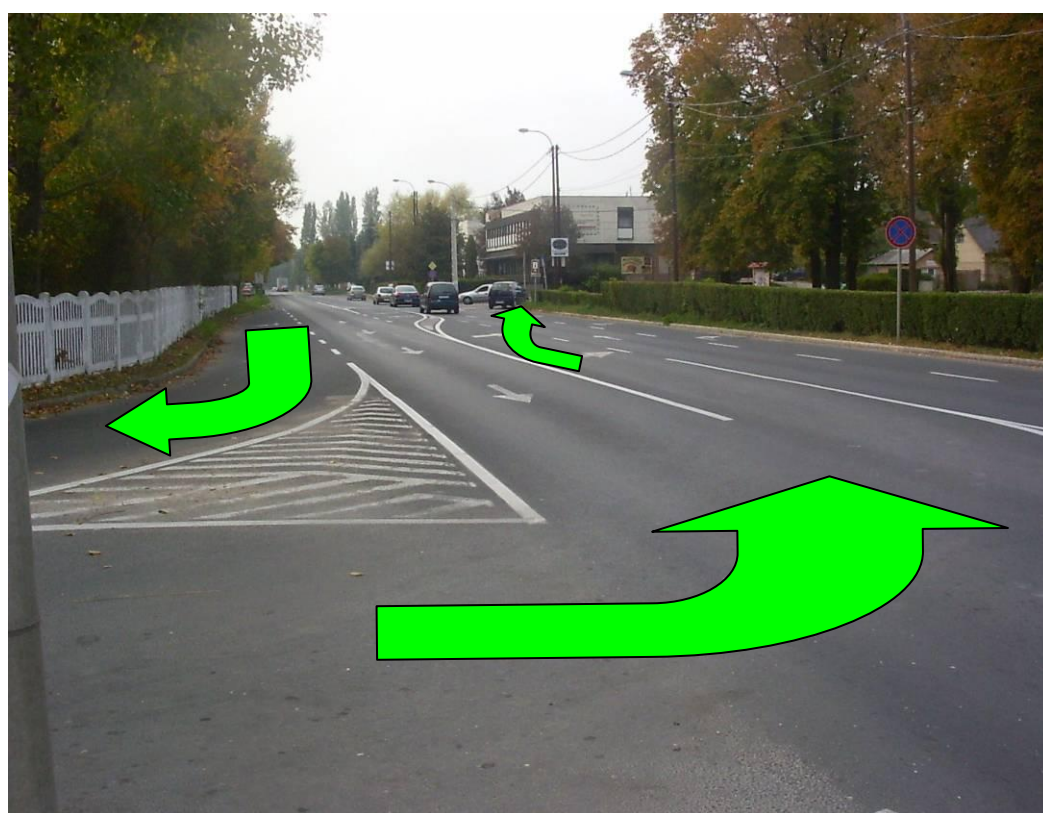


Figure 22: Turning lanes at LC SR2 on main road no. 71 in the direction of Balatonfűzfő



Figure 23: LC no. AS373 secured with warning lights in the direction of Balatonakarattya

As “a” and “c” warning lights of LC no. AS380 are only 2.5 metres from the edge of the main road, there is not enough space for vehicles to stop in front of the warning lights (when the lights are red) and thus, stopping vehicles may hinder the traffic on main road no. 71 (See Figure 24).



Figure 24: Vehicles standing in front of the Stop signal of the warning lights hider the traffic on main road no. 71



Figure 25: Running trains may reach and collide with vehicles passing the warning lights or those stopping in the clearance

Although the vehicles passing or stopping at “a” and “c” warning lights of LC no. AS380 no longer hinder other vehicles from driving on main road no. 71 from the direction of Balatonkenese, they are in the clearance area posing obstacles to trains arriving from Balatonakarattyá or Balatonkenese (See Figure 25).

A street (maintained by the local government) runs parallel with the rail track on the other side (Lake Balaton side), which is a one-way street only in the summertime from the direction of LC no. AS380 to Balatonkenese station.

4. Safety recommendations

Based on the findings of the investigation, the IC issues the following safety recommendations:

BA2006-0033-5-01: The IC recommends the National Transport Authority that it should - together with the bodies concerned - re-examine the position of LC no. AS380. The NTA should also consider whether it is justified to maintain LC no. AS380 - taking into consideration that LC no. SR2 at Balatonkenese station approximately 500 metres away is secured with warning lights and half barrier, and LC no. AS373 approximately 700 metres away in the direction of Lake Balaton are much safer and there are turning lanes to both latter LCs - or whether the application of other technical instruments should be ordained.

The reasons behind the safety recommendation::

On all four above mentioned occasions, the damaged cars were driving on main road no. 71 from the direction of Balatonakarattyá towards Balatonkenese then they turned left onto the LC regardless of the **“No left turn”** traffic sign. LC no. AS380 and its warning lights were operating normally in all cases.

LC no. SR2 secured with warning lights and half barrier at Balatonkenese station approximately 500 metres from LC no. AS380, and LC no. AS373 approximately 700 metres away as well as the main roads parallel with the rail track would ensure a much safer traffic. Furthermore, if LC no. AS380 was not used as an LC or if it was used only as a pedestrian crossing, it would not pose obstacles and hinder traffic either on the railway line or on main road no. 71.

4.1 Measures taken, observations and opinions regarding the issued safety recommendation

On account of the recurrent accidents, MÁV-START Zrt. recommended MÁV Zrt. Pályavasút to close down LC no. AS380 which is – in their view – is at an unsuitable location.

MÁV Zrt. agreed with the safety recommendation and as a similar accident happened in 2006 at LC no. AS380, it recommended the Transport Supervisory Authority of Veszprém County to re-examine the position of LC no. AS380 and to close the LC from road traffic considering that there is another LC 500 metres away secured with warning lights and half barrier which is safer and more favourably positioned from both railway and road traffic aspects. The Transport Supervisory Authority did not initiate the close-down of the LC, however, in order to enhance safety, it supported the supplementation of the LC with half barrier as well as the replacement of lenses of the warning lights with “LED” lenses which provide better visibility. LC no. AS380 was supplemented with half barrier and the lenses of its warning lights were replaced on 21st December 2007. The deadline of the completion of this project was 31st March 2008.

The representative of the NTA informed the IC at the closing discussion of the draft report that the authorities may institute proceedings regarding the close-down of the LC - pursuant to section (3), Article 3 of KM Decree no. 20 of 1984 (XII. 21) - only **“if and when road traffic is insignificant and it can be directed to other LC or railway pedestrian crossing”**. In other cases, the Transport Authority can institute proceedings only upon petition. The re-examination of LC no. AS380 and its surroundings are justified in transport safety aspects. The re-examination should be performed by initiating the railway maintenance organisation, the road maintenance organisations as well as the competence police authorities.

The participants of the closing discussion agreed that the re-examination (from transport safety point of view) of LC no. AS380 was justified.

Budapest, 28th July 2008.

András Mihály
Member of IC

Ferenc Pataki
Member of IC

Iván Lócsi
Investigator-in-charge

*NOTE: This present document is the translation of the Hungarian version of the Final Report. Although efforts have been made to translate it as accurately as possible, discrepancies may occur.
In this case, the Hungarian is the authentic, official version.*