



***Federal Railroad Administration  
Office of Railroad Safety  
Accident and Analysis Branch***

***Accident Investigation Report  
HQ-2017-1192***

***CSX Transportation (CSX)  
Biloxi, MS  
March 7, 2017***

***Note that 49 U.S.C. §20903 provides that no part of an accident or incident report, including this one, made by the Secretary of Transportation/Federal Railroad Administration under 49 U.S.C. §20902 may be used in a civil action for damages resulting from a matter mentioned in the report.***

**SYNOPSIS**

**Synopsis**

A northbound CSX Transportation (CSX) freight Train Q606-07 collided with a motor coach at a highway-rail grade crossing on March 7, 2017, at 2:11 p.m., CST. The accident occurred in Biloxi, Mississippi, at the Main Street public highway-rail grade crossing (U.S. DOT No. 340185W) at CSX Milepost 000726.61 on CSX's Atlanta Division, NO&M Subdivision. The motor coach carried a driver and 49 passengers.

Forty passengers and the driver sustained injuries, 5 passengers were uninjured, and 4 passengers were fatally injured.

The motor coach was destroyed with an estimated loss of \$500,000. There were no injuries to the train crew. The lead locomotive sustained an estimated \$3,590 in damages, and track and signal sustained an estimated \$32,662 in damages.

No equipment derailed, no hazardous materials were involved in this collision. This was not PTC-preventable. This is an Amtrak route with discontinued service.

At the time of the accident, it was daylight with clear skies, south-southwest winds of 8 mph and 68 °F.

The accident was caused by the motor coach driver's inattentiveness to highway-rail grade crossing signs, when the driver continued through a clearly marked low ground clearance – humped crossing with a long wheelbase vehicle. The Federal Railroad Administration cause code for this accident is M302 (Highway user inattentiveness).

**TRAIN SUMMARY**

1. Name of Railroad Operating Train #1 CSX Transportation	1a. Alphabetic Code CSX	1b. Railroad Accident/Incident No. 167264
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**GENERAL INFORMATION**

1. Name of Railroad or Other Entity Responsible for Track Maintenance CSX Transportation	1a. Alphabetic Code CSX	1b. Railroad Accident/Incident No. 167264
2. U.S. DOT Grade Crossing Identification Number 340185W	3. Date of Accident/Incident 3/7/2017	4. Time of Accident/Incident 2:11 PM
5. Type of Accident/Incident Hwy-Rail Crossing		
6. Cars Carrying HAZMAT 19	7. HAZMAT Cars Damaged/Derailed 0	8. Cars Releasing HAZMAT 0
	9. People Evacuated 0	10. Subdivision NO&M
11. Nearest City/Town Biloxi	12. Milepost (to nearest tenth) 000726.6	13. State Abbr. MS
		14. County HARRISON
15. Temperature (F) 68 °F	16. Visibility Day	17. Weather Clear
		18. Type of Track Main
19. Track Name/Number Single Main	20. FRA Track Class Freight Trains-60, Passenger Trains-80	21. Annual Track Density (gross tons in millions) 24.8
		22. Time Table Direction North

**OPERATING TRAIN #1**

1. Type of Equipment Consist: Freight Train					2. Was Equipment Attended? Yes			3. Train Number/Symbol Q606-07			
4. Speed (recorded speed, if available) R - Recorded 19.0 MPH E - Estimated		Code R	5. Trailing Tons (gross excluding power units) 3990		6a. Remotely Controlled Locomotive? 0 = Not a remotely controlled operation 1 = Remote control portable transmitter 2 = Remote control tower operation 3 = Remote control portable transmitter - more than one remote control transmitter					Code 0	
6. Type of Territory Signalization: <u>Signaled</u> Method of Operation/Authority for Movement: <u>Signal Indication</u> Supplemental/Adjunct Codes: _____											
7. Principal Car/Unit		a. Initial and Number		b. Position in Train		c. Loaded (yes/no)		8. If railroad employee(s) tested for drug/alcohol use, enter the number that were positive in the appropriate box		Alcohol	Drugs
(1) First Involved <i>(derailed, struck, etc.)</i>		CSXT 230		1		no				0	0
(2) Causing <i>(if mechanical, cause reported)</i>		0		0		no		9. Was this consist transporting passengers?		No	
10. Locomotive Units (Exclude EMU, DMU, and Cab Car Locomotives.)	a. Head End	Mid Train		Rear End		11. Cars (Include EMU, DMU, and Cab Car Locomotives.)	Loaded		Empty		e. Caboose
		b. Manual	c. Remote	d. Manual	e. Remote		a. Freight	b. Pass.	c. Freight	d. Pass.	
		(1) Total in Train	3	0	0		0	0	(1) Total in Equipment Consist	27	
(2) Total Derailed	0	0	0	0	0	(2) Total Derailed	0	0	0	0	0
12. Equipment Damage This Consist 3590			13. Track, Signal, Way & Structure Damage 32662								
14. Primary Cause Code M302 - Highway user inattentiveness											
15. Contributing Cause Code N/A - N/A											
Number of Crew Members						Length of Time on Duty					
16. Engineers/Operators		17. Firemen		18. Conductors		19. Brakemen		20. Engineer/Operator		21. Conductor	
1		0		1		0		Hrs: 6 Mins: 41		Hrs: 6 Mins: 41	
Casualties to:		22. Railroad Employees		23. Train Passengers		24. Others		25. EOT Device?		26. Was EOT Device Properly Armed?	
Fatal		0		0		4		Yes		Yes	
Nonfatal		0		0		41		27. Caboose Occupied by Crew?		N/A	
28. Latitude 30.399123000				29. Longitude -88.885662000							

**CROSSING INFORMATION**

Highway User Involved		Rail Equipment Involved	
1. Type Bus		5. Equipment Train (Units Pulling)	
2. Vehicle Speed ( <i>est. mph at impact</i> ) 0	3. Direction ( <i>geographical</i> ) North	6. Position of Car Unit in Train 1	
4. Position of Involved Highway User Stalled or Stuck on Crossing		7. Circumstance Rail Equipment Struck Highway User	
8a. Was the highway user and/or rail equipment involved in the impact transporting hazardous materials? Rail Equipment		8b. Was there a hazardous materials release by N/A	
8c. State here the name and quantity of the hazardous material released, if any. N/A			
9. Type of Crossing  1. Gates      4. Wig wags      7. Crossbucks      10. Flagged by crew 2. Cantilever FLS      5. Hwy. traffic signals      8. Stop signs      11. Other ( <i>spec. in narr.</i> ) 3. Standard FLS      6. Audible      9. Watchman      12. None  1, 3, 6, 7, 11		10. Signaled Crossing Warning 1, 1, 1	11. Roadway Conditions Dry
12. Location of Warning Both Sides		13. Crossing Warning Interconnected with Highway Signals No	14. Crossing Illuminated by Street Lights or Special Lights No
15. Highway User's Age 60	16. Highway User's Gender Male	17. Highway User Went Behind or in Front of Train and Struck or was Struck by Second Train No	18. Highway User Other (specify in narrative)
19. Driver Passed Standing Highway Vehicle No		20. View of Track Obscured by ( <i>primary obstruction</i> ) Not Obstructed	
Casualties to:	Killed	Injured	21. Driver was Injured
23. Highway-Rail Crossing Users	4	41	24. Highway Vehicle Property Damage ( <i>est. dollar damage</i> ) 500000
25. Total Number of Vehicle Occupants ( <i>including driver</i> )	50		
26. Locomotive Auxiliary Lights? Yes		27. Locomotive Auxiliary Lights Operational? Yes	
28. Locomotive Headlight Illuminated? Yes		29. Locomotive Audible Warning Sounded? Yes	

**10. Signaled Crossing Warning**

**Explanation Code**

- |  |  |
|--|--|
| 1 - Provided minimum 20-second warning             | A - Insulated rail vehicle   |
| 2 - Alleged warning time greater than 60 seconds   | B - Storm/lightning damage   |
| 3 - Alleged warning time less than 20 seconds      | C - Vandalism  |
| 4 - Alleged no warning                             | D - No power/batteries dead  |
| 5 - Confirmed warning time greater than 60 seconds | E - Devices down for repair  |
| 6 - Confirmed warning time less than 20 seconds    | F - Devices out of service   |
| 7 - Confirmed no warning                           | G - Warning time greater than 60 seconds attributed to accident-involved train stopping short of the crossing, but within track circuit limits, while warning devices remain continuously active with no other in-motion train present |
| N/A - N/A  | H - Warning time greater than 60 seconds attributed to track circuit failure (e.g., insulated rail joint or rail bonding failure, track or ballast fouled)   |
|  | J - Warning time greater than 60 seconds attributed to other train/equipment within track circuit limits   |
|  | K - Warning time less than 20 seconds attributed to signals timing out before train's arrival at the crossing/island circuit   |
|  | L - Warning time less than 20 seconds attributed to train operating counter to track circuit design direction  |
|  | M - Warning time less than 20 seconds attributed to train speed in excess of track circuit's design speed  |
|  | N - Warning time less than 20 seconds attributed to signal system's failure to detect train approach   |
|  | O - Warning time less than 20 seconds attributed to violation of special train operating instructions  |
|  | P - No warning attributed to signal systems failure to detect the train  |
|  | R - Other cause(s). Explain in Narrative Description   |

SKETCHES

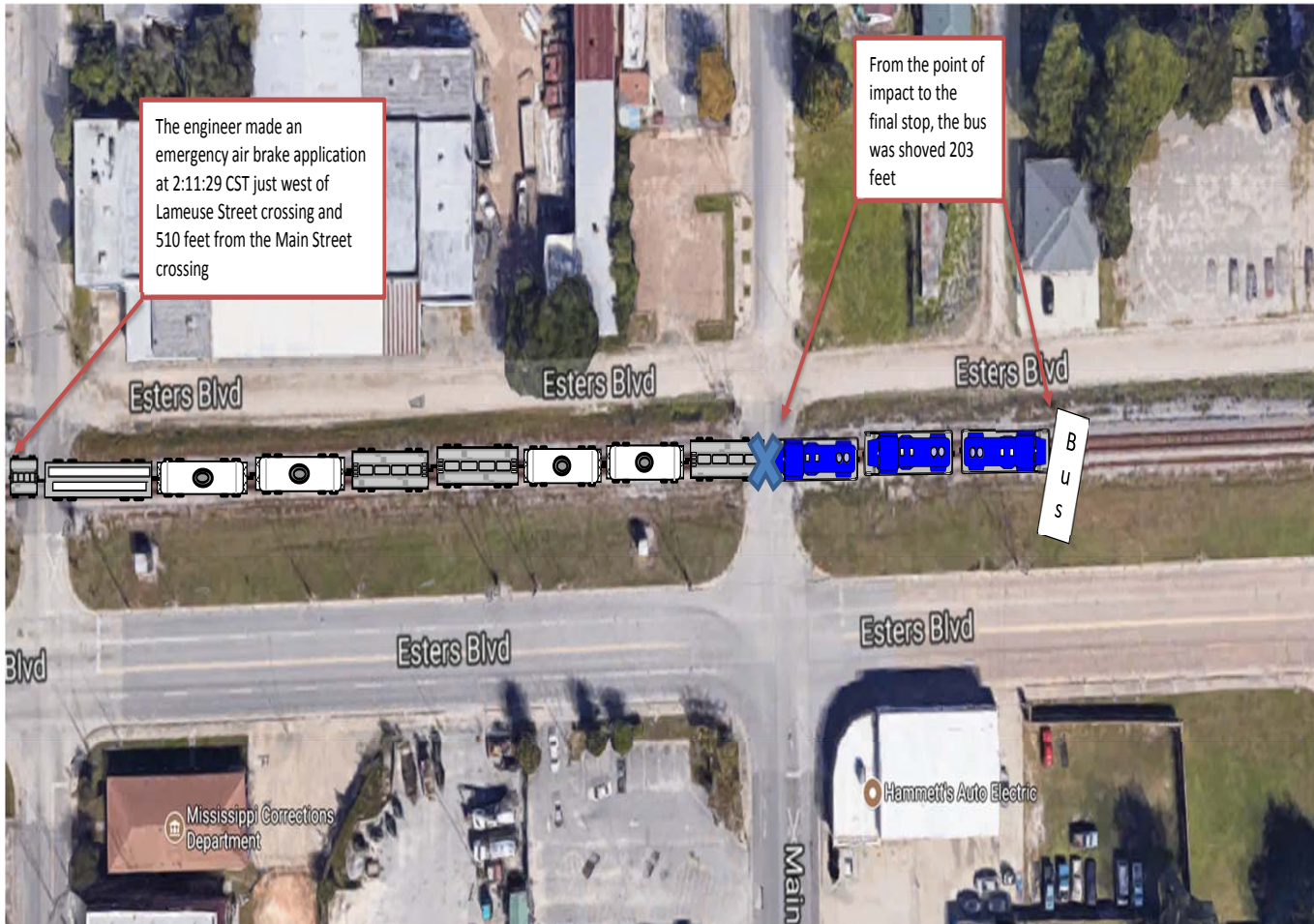
Sketch of Accident Scene

HQ-2017-1192



Geographical Direction







## NARRATIVE

**Circumstances Prior to the Accident***Train Q606-07*

The crew of CSX Transportation (CSX) Train Q606-07 included a locomotive engineer and conductor. They went on duty at 7:30 a.m. CST, on March 7, 2017, at CSX's Gentilly Yard in New Orleans, Louisiana. This was the away-from-home terminal for both crew members. Prior to reporting for duty, both crew members received more than the required statutory off-duty period.

The train consisted of 3 locomotives, 27 loaded, and 25 empty cars of several varieties. It was 3,164 feet long, and weighed 3,990 tons. The train originated at Gentilly Yard and received the required pre-departure inspection and Class 1 air brake test prior to departure. The train departed Gentilly Yard at 7:50 a.m., traveling east. The train was scheduled to proceed to Mobile, Alabama, with no pick-ups or set-offs en route. The lead locomotive was equipped and running with Trip Optimizer and Positive Train Control (PTC). PTC was active.

As the train approached the accident area, the Engineer was seated at the controls of the leading locomotive, the Conductor was seated on the opposite side. The speed of the train was 27 mph, operating on a clear signal indication as it passed Milepost (MP) 000727 around 2:09 p.m. The Trip Optimizer was slowing the train for the draw bridge at MP 000724.3. As the train crossed Bohn Street, the crew noticed the motor coach bus on the Main Street crossing. There are six highway-rail grade crossings within a half-mile west of Main Street. The Engineer stated he saw the bus in the distance, but did not know it was stuck; he was focusing most of his attention on the crossings immediately in front of the train and any pedestrians or vehicles traveling on the adjacent roads. About 2:11 p.m., at MP 000726.77, the train neared the bus. The Engineer asked the Conductor if the bus was held up by traffic, and whether the bus was going to move. As they got closer, the Engineer still expected the bus to clear the crossing and when it didn't, the Engineer told the Conductor, "I'm going to shoot the brakes." Approaching Main Street from the west, the track is tangent for 1 mile with a 0.26-percent descending grade. East of the Main Street crossing the track is tangent for 1,584 feet with a 0.30-degree curve to the left.

The method of operation is by signal indication from a traffic control system. This is Class 4 track with 60 mph maximum speed for freight and 80 mph maximum speed for passenger trains. CSX's Timetable authorized train speed through the area of the accident is 45 mph for both passenger and freight trains.

*The Bus*

Echo Transportation, a charter bus service company, leased and operated the 2016-model Van Hool motor coach bus for a casino tour arranged by Diamond Tours, Inc. The tour left Bastrop, Texas, on March 5, 2017, with a scheduled return on March 11, 2017. The bus Driver (Driver) and passengers stayed at the Hollywood Casino and Resort in Bay St. Louis, Mississippi, the night before the accident. Their prearranged departure time from the casino was 1:00 p.m.

The Driver had more than 12 hours of off-duty time prior to going on duty. At 12:00 p.m., he conducted a pre-trip inspection of the motor coach and started the vehicle to cool the interior with the air conditioner. About 12:45 p.m., the Driver pulled the bus to the resort for loading of passengers. Once loaded, they



departed Hollywood Casino and Resort destined for the Boomtown Casino in Biloxi, Mississippi. The planned route was east on Interstate 10, however, at the request of the passengers, the Driver changed to the more scenic route, using U.S. Highway 90 along the coast.

The motor coach traveled east on U.S. Highway 90 and turned north onto Main Street. As the motor coach proceeded north on Main Street, it passed Hammett's Auto Electric Company at the corner of Main Street and Esters Boulevard. This was captured by Hammett's security camera and showed the time as 1:54 p.m.

As the motor coach approached the accident area, it crossed the intersection of Main Street and Esters Boulevard. The Driver noticed the regulatory educational plaque noting, "Low Ground Clearance" and the sign displaying a tractor with a low-boy trailer in a hang-up situation, but was distracted by a westbound car on Esters Boulevard not stopping for a stop sign.

The motor coach came to a stop on the south approach to Main Street highway-rail grade crossing (DOT# 340185W) and the Driver put on the hazard lights. He noticed the slope of the crossing approach, and raised the motor coach with the kneeling feature. The kneeling feature is an electrically controlled air-operated system that reduces the ground-to-first-step height, allowing the passengers to get on and off the motor coach more easily. It accomplishes this by adding or removing air from the front and rear axle air springs to raise or lower the vehicle.

At that time, the highway-rail grade crossing gates were up; the lights and bells were not activated. The Driver looked in both directions for trains, after seeing none, he proceeded north through the highway-rail grade crossing. At the top of the highway-rail grade crossing, the Driver noticed how steep the north side approach was and exclaimed, "Jesus," but kept going. When the front wheels started down the north side approach, the motor coach got stuck. The Driver made numerous attempts to reverse the motor coach and then pull forward, but the motor coach could not move. A passenger noticed the train lights and yelled to the Driver that a train was coming. At first, the Driver thought the passenger was joking until he saw the locomotive lights. The Driver opened the front door and told the tour guide "we have to get everyone off the bus." The tour guide began evacuating passengers from the motor coach. The Driver noted that the crossing bell was ringing and the lights were flashing.

Traveling north on Main Street, the road is tangent for 1,102 feet from Howard Avenue to the highway-rail grade crossing and a ½-mile beyond. The road is practically level until you reach the highway-rail grade crossing. The vertical grade for northbound traffic as it approached the railroad tracks on Main Street is an approximate 6.9-percent ascending grade. As northbound traffic crosses the tracks, there is an approximate 21.5-percent descending grade. Because of the extreme slope, the crossing is clearly marked with the required regulatory educational plaque noting, "Low Ground Clearance," and the sign displaying a tractor with a low-boy trailer in a hang-up situation in accordance with the USDOT/FHWA Manual on Uniform Traffic Control Devices.

All times in this report are listed as Central Standard Time, all CSX documents times are listed as Eastern Standard Time. There is a 1-hour difference between Biloxi local time and "railroad" time. The railroad timetable direction is reported as north. The geographic direction in the accident area is east and west. Geographical directions are used throughout this report.

### **The Accident**

At 2:11:29 p.m., the train was running at 27 mph when the Engineer initiated an emergency air brake

application at MP 000726.74, about 510 feet west of Main Street crossing. At 2:11:43 p.m., the train collided with the motor coach broadside at 19 mph as it straddled the crossing. The motor coach was shoved east down the track 203 feet, until everything came to a stop at 2:12:00 p.m. The motor coach remained on the track with the front of the locomotive into its side.

The Engineer announced on the radio “emergency” three times and stated “606 has hit a bus and it’s bad, send help.” The Engineer contacted the Dispatcher on the radio and notified him of the accident. The Conductor retrieved his personal cell phone from his case, turned it on and called the Trainmaster. According to the Conductor and Engineer, the Biloxi Police Department were first on-scene, arriving within 3 minutes of the accident. The Conductor dismounted the locomotive to provide help, or assist police if needed. The Engineer stayed at the controls of the locomotive. Shortly after, additional police and emergency responders arrived and the Conductor was no longer needed; he returned to the locomotive cab. Both crew members stayed in the cab until relieved. The train crew was transported to CSX’s Mobile, Alabama, Yard, where they went off-duty.

The passengers of the motor coach were in the process of evacuating through the right front door when the train collided with the motor coach. Six passengers got off and out of the way prior to impact. Some passengers were in the stairwell or on the ground alongside the motor coach and were knocked down and caught under the motor coach and locomotives. Three of them were fatally injured. The other fatality was to a passenger standing in the aisle of the motor coach. The Driver, who remained in his seat, had broken ribs and a punctured lung on his left side. Four passengers had life-threatening injuries, five passengers were uninjured, and the remaining passengers had moderate to minor injuries. Firefighters extracted two passengers using the Jaws of Life.

In addition to the Biloxi Police Department, there was a massive response to the accident. The emergency responders included the Harrison County Sheriff Department, Mississippi State Highway Patrol, Mississippi Motor Carrier Compliance, Mississippi DOT, Biloxi Fire and Rescue, D’Iberville Fire and Rescue, Keesler Air Force Base Emergency Medical Services, American Medical Response Ambulance Service, Harrison County Ambulance Service, Jet Rescue Air Ambulance Service, and Base Medical Transport Air Ambulance Service. Within 90 minutes, all passengers were removed from the motor coach and transported to five area hospitals: Singing River Hospital, Ocean Springs Hospital, Garden Park Community Hospital, Biloxi Memorial Hospital, and Gulf Port Memorial Hospital.

### **Analysis and Conclusions**

Analysis – Toxicology: Testing is not required for train crew members involved in a highway-grade crossing accident per Title 49 Code of Federal Regulation (CFR) Section 219.201(b).

Echo Transportation had the hospital administer a DOT Federal Motor Carrier Safety Administration (FMCSA) post-accident alcohol and drug test immediately after the accident and the toxicology results were negative for alcohol and drugs.

Conclusion: Alcohol and Drugs were not a factor for this accident.

Analysis – Fatigue Analysis: Q606-07 Train Conductor: The Federal Railroad Administration (FRA) uses an overall effectiveness rate of 77.5 percent as the baseline for fatigue analysis. At or above this baseline, FRA does not consider fatigue as probable for any employee. Software sleep settings vary according to information obtained from each employee. If an employee does not provide sleep information, FRA uses the default software settings. FRA obtained fatigue-related information, including

a 10-day work history, for the subject of this investigation.

Information for the employee is as follows:

Conductor assigned to Train Q606-14

Sleep setting - Good

Overall effectiveness = 83.13 percent

Lapse index = 2.57

Reaction time = 120.3 percent

Chronic sleep debt = 6.43

Hours of continuous wakefulness = 10.6

Time of day 2:15 p.m.

Conclusion: FRA determined fatigue was not present and not a causal or contributing factor in this accident.

Analysis - Fatigue Analysis: Q606-07 Train Engineer: FRA uses an overall effectiveness rate of 77.5 percent as the baseline for fatigue analysis. At or above this baseline, FRA does not consider fatigue as probable for any employee. Software sleep settings vary according to information obtained from each employee. If an employee does not provide sleep information, FRA uses the default software settings. FRA obtained fatigue-related information, including a 10-day work history, for the subject of this investigation.

Information for the employee is as follows:

Engineer assigned to Train Q606-07

Sleep setting - Good

Overall effectiveness = 79.59 percent

Lapse index = 3.19

Reaction time = 125.64 percent

Chronic sleep debt = 7.41

Hours of continuous wakefulness = 10.97

Time of day 2:15 p.m.

Conclusion: FRA determined fatigue was not present and not a causal or contributing factor in this accident.

Analysis – Track Structure: CSX and FRA conducted track inspections in the accident area after the train and motor coach were moved. A track alignment deviation, 43 feet east of Main Street was identified and determined to be caused by the impact between the train and motor coach during the accident. No other track deficiencies were found that would have contributed or been causal to this accident.

FRA reviewed CSX's track inspection records pertinent to the segment of track at the accident location over a 3-month period from December 1, 2016, to March 7, 2017. During that period, CSX conducted weekly inspections and took no exceptions to track conditions. On February 14, 2017, CSX identified loose, worn, or missing frog bolts at MP 000723.1, about 3 miles east of the accident location. No exceptions were noted to track conditions during the most recent FRA track inspection on October 10, 2016.

Conclusion: Track structure was not a factor for this accident.

Analysis – Warning Devices and Control Equipment for Main Street Highway-rail Grade Crossing at MP

000726.61 (U.S. DOT No. 340185W): The highway-rail grade crossing warning devices at Main Street consist of 16, 12-inch diameter LED flashing lights, 2 gates, 1 electronic bell, 2 cross buck signs, and 2 emergency notification system (ENS) signs, all of which are mounted on 2 separate 5-inch diameter signal masts attached to concrete foundations in the ground.

The northwest quadrant signal consists of a total of eight lights; one set of back-to-back, 12-inch LED's, a jury arm supporting one set of back-to-back 12-inch LED's, one gate arm, one cross buck sign, and one ENS sign.

The southeast quadrant signal consists of a total of eight lights; one set of back-to-back 12-inch LED's, a jury arm supporting of one set of back-to-back 12-inch LED's, one gate arm, a bell, one cross buck sign, and one ENS sign.

The warning devices are controlled by a Safetran Grade Crossing Predictor Model 3000ND2 bi-directional redundant unit which is mounted inside a 6'-by-6' aluminum bungalow. Additional equipment mounted inside the case consists of a Hawk Data Recording Unit, three NRS Battery Chargers, Model ELC-12/20-S and three battery banks.

The circuit plans show the eastbound approach length at 2,636 feet and westbound approach length at 2,098 feet with the program of the GCP 3000 unit designed for 25 seconds of constant warning time. The circuit plans show the island circuit design at 132 feet. FRA verified all approach and island circuit distances.

All operational tests, downloads, photographs, and documentation revealed that the highway-rail grade crossing warning devices and control equipment functioned as intended at the time of the accident. A download of the data from the Hawk Unit revealed the unit detected the train. The warning time was 30 seconds (Federal Regulation requires a minimum of 20 seconds).

Sight distances for trains operating in both directions were found unobstructed for more than a ½-mile on each side of the highway-rail grade crossing.

Conclusion: The highway-rail grade warning devices and control equipment at Main Street worked as intended. The highway-rail grade crossing warning devices and control equipment were not a contributing cause of this accident.

Analysis - Roadways, Measurements, Signs and Markings: Main Street is a two-lane, paved city street with a posted speed limit of 25 mph and intersects the highway-rail grade crossing at a 90-degree angle.

There are no obstructions interfering with site distance of rail traffic in either direction when stopped at the crossing.

The highway-rail grade crossing is constructed of asphalt, and the road surface at the crossing is 27-feet wide.

Traveling north on Main Street, about 382-feet from the nearest rail of the highway-rail grade crossing there is an advance warning sign on the east side of the road. About 155-feet south of the nearest rail there is a highway-rail grade crossing pavement symbol painted on the road.

Traveling south on Main Street, about 255-feet north of the nearest rail of the highway-rail grade crossing there is an advance warning sign located on the west side of the road. There is no highway-rail grade crossing pavement symbol painted on the north side of the road. The roadway had previously been milled-up for resurfacing.

On both sides of the highway-rail grade crossing 25-feet from the nearest rails are stop bars painted on

the crossing approaches.

Esters Boulevard runs parallel to the tracks on the north and south side. On the south side of the tracks, Esters Boulevard is a four-lane highway with a solid double yellow center line. On the northside of the track, Esters Boulevard is a two-lane unmarked paved road.

Installed in advance of the crossing on the southeast and northwest corners of Main Street and Esters Boulevard, are the required regulatory educational plaques noting, "Low Ground Clearance" and signs displaying a tractor with a low-boy trailer in a hang-up situation. These signs are attached to a galvanized U-channel post.

Sight distances for highway users in both directions is unobstructed for more than a half-mile on each side of the highway-rail grade crossing.

Conclusion: The crossing is well-marked with advance warning signs. Additional signs were present indicating this is a humped crossing with low-ground clearance and not suitable for long wheelbase vehicles. The location of these signs were placed to ensure that once noticed, a vehicle could detour without issue. The sight distances and advanced approach signs were not a contributing cause of this accident.

Analysis – Mechanical Inspection: A complete Class 1 air brake test was performed on the train after the accident by FRA with the assistance of CSX. The locomotive horn, head lights, auxiliary lights, bell, and alerter were tested. All required locomotives inspections, tests, and records were in compliance with federal regulations. Records show the train received the required pre-departure inspection and air brake tests prior to departing Gentilly Yard. No exceptions to the locomotives or freight cars were taken.

During post-accident interviews, the Engineer stated he only had the lead locomotive operating, and had no issues with the train.

Post-accident investigations confirmed that as the train approached the highway-rail grade crossing, the horn and bell were sounding, the head lights and auxiliary lights were on and working as intended. PTC was active but will not prevent collisions with a vehicle at a highway-rail grade crossing.

Conclusion: There was no defective conditions noted on the equipment that would have contributed to or could have caused this accident.

Analysis – Train Handling: The locomotive event recorder data and forward-facing Rail-View camera from the lead locomotive of the train were downloaded and analyzed by CSX. The analysis disclosed the Engineer operated the train within authorized timetable speeds, followed all applicable railroad operating rules, and airbrake/train handling rules. FRA reviewed the results of this analysis, and concurred with the conclusions.

There are six highway-rail grade crossings within a half-mile as the train traveled from MP 000727.11, Bohn Street to MP 000726.61, Main Street. The Rail-View video showed the Engineer had a clear and unobstructed view of the track and highway-rail grade crossings. A review of the video draws your attention to the highway-rail grade crossings directly in front of the locomotive. After reviewing the video several times, the motor coach can be seen on the Main Street highway-rail grade crossing while the locomotive is around MP 000726.77. It was difficult to determine if the motor coach was stuck. The Engineer initiated an emergency air brake application around MP 000726.74.

Conclusion: Train handling was not a factor in this accident.

Analysis – Sight Distance: On March 8, 2017, the day after the collision, a re-enactment was conducted.

CSX provided FRA and the National Transportation Safety Board with a large truck, similar to the size of the motor coach, and an eastbound train for a sight distance test. The truck was positioned on the highway-rail grade crossing and the train traveled east toward the accident site at under 10 mph. Once the locomotive reached Bohn Street, the truck could be seen from the cab of the locomotive. At that speed and distance, it could not be determined if the truck was stopped or moving. At Magnolia Street MP 000726.81, there was a very clear view of the truck. However, the onboard observers were constantly watching the traffic on the adjacent roads and intersecting streets crossings directly in front of the locomotive.

Conclusion: The test showed the crew member's view was unobstructed, sight distance was not a factor.

Analysis – Motor Coach and Driver Performance: The Motor Coach bus was properly registered. The Mississippi Department of Public Safety, Motor Carrier Safety Division Officers conducted a Level 3 Inspection of the vehicle, with no citations being issued.

The examination report listed two violations:

1. Code 395.8a – No driver record of on duty Status
2. Code 392.2RG – No cab card

During an interview of the Driver, he stated he provides the passengers with a safety briefing at the beginning of the tour, which related to emergencies, locations of the emergency exits and how they operate.

The Driver had a valid Texas, Class B Commercial Driver's License (CDL) with passenger/school bus endorsement, without restrictions. The CDL had an issue date of January 2017, and an expiration date of March 2021.

Interviews of several passengers found they had a favorable opinion of the Driver. They were very complimentary.

A review of the Driver's performance showed several areas of concern. During the interview, the Driver stated, as he approached the crossing on Main Street, he saw the low ground clearance sign, but was distracted by a car on Esters Boulevard. His words were, "I saw the sign but, I didn't see the sign." After the motor coach crossed the intersection of Main Street and Esters Boulevard, the Driver noticed the slope of the crossing approach so he raised the motor coach with the kneeling feature. He then proceeded through the crossing. He stated, "I proceeded to go over the track. When I got to the top of the track with the bus, and I looked down, I said, "Jesus," and kept going. "That's when the bus got hung up."

Based on the time the motor coach got stuck on the crossing and when the collision occurred, more than 5 minutes elapsed; however, the passengers did not begin to evacuate until about one minute before the collision. There were no attempts by the Driver to call 911, or the 1-800 number posted on the Emergency Notification Signs mounted on the crossing signal masts.

Conclusion: The motor coach was properly registered with a current license and in good condition. The Driver was properly licensed. The Driver failed to fully recognize the low ground clearance sign and comprehend the potential hazards of driving over the humped crossing with a long-wheelbase vehicle.

### **Overall Conclusion**

All train and locomotive inspections were completed as required. All locomotive safety devices functioned as intended. Based on crew interviews and the locomotive event recorder data, there were no

exceptions to the train's operation. The highway-rail grade crossing warning devices and control equipment functioned as intended.

**Probable Cause**

The accident was caused by the Driver's inattentiveness to highway-rail grade crossing signs, when the Driver continued through a clearly marked low ground clearance – humped crossing with a long wheelbase vehicle. FRA's cause code for this accident is M302 – Highway user inattentiveness.