



AVIATION



HIGHWAY



MARINE



RAILROAD



PIPELINE

October 4, 2023

Railroad Investigation Report RIR-23-13

# Watco Dock and Rail, L.L.C.

## Employee Fatality

Houston, Texas  
October 29, 2021

**Abstract:** This report discusses the October 29, 2021, fatality of a conductor who was killed when his train collided with a combination vehicle at a private highway-railroad grade crossing in Houston, Texas. The safety issue identified in this report is the need to prohibit railroad employees from riding shoving movements through highway-railroad grade crossings equipped with only flashing lights or passive warning devices and without ground protection. One recommendation is made to the Federal Railroad Administration, and one recommendation is made to the General Code of Operating Rules Committee, the Northeast Operating Rules Advisory Committee, Canadian National Railway, the Norfolk Southern Corporation, and the American Short Line and Regional Railroad Association.

## Contents

<b>Figures .....</b>	<b>iv</b>
<b>Acronyms and Abbreviations.....</b>	<b>v</b>
<b>Executive Summary.....</b>	<b>vi</b>
What Happened.....	vi
What We Found .....	vi
What We Recommended .....	vii
<b>1 Factual Information.....</b>	<b>1</b>
1.1 Accident Description .....	1
1.2 Events Before the Accident.....	5
1.3 Watco Dock and Rail.....	5
1.4 Gemini Motor Transport.....	5
1.5 Highway-Railroad Grade Crossing Description .....	5
1.6 Rules and Regulations Governing the Accident Movement.....	7
1.6.1 Federal Railroad Administration Regulations for Shoving or Pushing.....	7
1.6.2 General Code of Operating Rules.....	7
1.6.3 Gemini Motor Transport Code of Conduct.....	8
1.7 On-Site Observations .....	8
1.8 Personnel Information .....	9
1.9 Postaccident Toxicology Testing .....	9
1.10 Similar Grade-Crossing Accidents.....	10
1.11 Postaccident Actions .....	11
1.11.1 Watco .....	11
1.11.2 Gemini Motor Transport .....	12
<b>2 Analysis.....</b>	<b>13</b>
2.1 Introduction .....	13
2.2 Accident Summary.....	14
2.3 Protecting Railroad Workers at Highway-Railroad Grade Crossings .....	14
<b>3 Conclusions.....</b>	<b>18</b>

---

3.1 Findings.....	18
3.2 Probable Cause .....	18
<b>4 Recommendations .....</b>	<b>19</b>
New Recommendations.....	19
<b>Appendixes .....</b>	<b>21</b>
Appendix A: Investigation .....	21
Appendix B: Consolidated Recommendation Information .....	22
<b>References.....</b>	<b>24</b>

## Figures

Figure 1. Overhead photograph of accident location. (Source: Google Earth.).....	2
Figure 2. Exemplar tank car depicting the vertical handhold and platform. (Source: Transportation Safety Board of Canada.) .....	3
Figure 3. Highway-railroad grade crossing at Greens Port Industrial Park (Source: Federal Railroad Administration.).....	6
Figure 4. Flood lights at the industrial park entrance. ....	8
Figure 5. Highway-railroad grade crossing signage with LED lights. ....	12

## Acronyms and Abbreviations

ASLRRRA	American Short Line and Regional Railroad Association
CFR	<i>Code of Federal Regulations</i>
FRA	Federal Railroad Administration
GCOR	General Code of Operating Rules
NORAC	Northeast Operating Rules Advisory Committee
NTSB	National Transportation Safety Board
Watco	Watco Companies, L.L.C.
WDRL	Watco Dock and Rail, L.L.C.

## Executive Summary

### What Happened

On October 29, 2021, about 4:02 a.m. local time, a Watco Dock and Rail, L.L.C. (WDRL) conductor from WDRL train 202 was killed protecting a shoving movement when the train collided with a Gemini Motor Transport-operated combination vehicle at a private highway-railroad grade crossing outside the Greens Port Industrial Park in Houston, Texas. The conductor was riding on the platform of the leading railcar of train 202 when he was pinned between the train and the combination vehicle as both vehicles simultaneously entered the grade crossing of the industrial park.

### What We Found

In this accident, the combination vehicle driver approached the entrance to the industrial park, traveling parallel to the tracks in the same direction as train 202, then turned onto the driveway and entered the crossing without first coming to a complete stop. The crossing was equipped with only passive warning devices. There was no physical barrier to the tracks such as a gate, and there was no crew on the ground with full visibility of the area. This left the train conductor with a limited amount of time to observe the approaching vehicle before the train entered the crossing. Although required by the Gemini Motor Transport's Driver Code of Conduct to stop before entering a highway-railroad grade crossing, the driver did not. We concluded that requiring ground protection at passive grade crossings will assure trains do not enter the crossing until it is clearly seen by the train crew that no traffic is approaching or stopped at the crossing. We also found that railroads throughout the United States rely on their own operating rules, which allow train crews to ride shoving movements through a highway-railroad grade crossing equipped only with flashing lights or passive warning devices, without the benefit of ground protection, increasing the risk of collision if the train crew or vehicle driver is not aware or does not observe the potential conflict.

The National Transportation Safety Board determines that the probable cause of the Houston, Texas, accident was the failure of the combination vehicle driver to follow the Gemini Motor Transport Driver Code of Conduct to stop the vehicle before entering the highway-railroad grade crossing. Contributing to the accident was the train's movement through a passive highway-railroad grade crossing without adequate protection.

## **What We Recommended**

As a result of this investigation, we recommended that the Federal Railroad Administration and rules committees, railroads, and associations prohibit railroad employees from riding shoving movements through highway-railroad grade crossings equipped only with flashing lights or passive warning devices unless ground protection is provided.

# 1 Factual Information

## 1.1 Accident Description

On October 29, 2021, about 4:02 a.m. local time, a Watco Dock and Rail, L.L.C. (WDRL) conductor from WDRL train 202 was killed while protecting a shoving movement<sup>1</sup>. The train collided with a Gemini Motor Transport (Gemini)-operated truck tractor/semitrailer (combination) vehicle at a private highway-railroad grade crossing outside of the Greens Port Industrial Park in Houston, Texas. The conductor was riding on the platform of train 202's leading railcar when he was pinned between the train and the combination vehicle as both vehicles simultaneously entered the grade crossing on the driveway entering the industrial park. (See figure 1.) WDRL estimated the damage to the railcar to be about \$3,800, and Love's Travel Stops & Country Stores estimated damages to the combination vehicle to be about \$33,400.<sup>2</sup> Visibility conditions at the time of the collision were dark and clear, and the temperature was 59°F.

---

<sup>1</sup> (a) All times in this report are in local time unless otherwise noted. (b) Visit [ntsb.gov](https://www.nts.gov) to find additional information in the [public docket](#) for this NTSB investigation (case number RRD22LR002). Use the [CAROL Query](#) to search safety recommendations and investigations. (c) Train 202 is also known as job 202 at WDRL, but for the purposes of this report, it will be referred to as train 202. (d) A *shoving movement* is the process of pushing tank cars or pushing a train from the rear with a locomotive. *Protecting* a shoving movement is when a crewmember or other qualified employee visually determines that the route is clear of obstructions and conflicting movements. (e) *Private highway-railroad grade crossings* are on privately owned roadways and are intended for use by the owner or by the owner's licensees and invitees. They are not intended for public use and are not maintained by a public highway authority. Private grade crossings may be governed by legal agreements between private property owners and private railroad companies.

<sup>2</sup> The combination vehicle was owned by Love's Travel Stops & Country Stores, Inc., but operated by Gemini Motor Transport.





**Figure 1.** Overhead photograph of accident location. (Source: Google Earth.)

The train crew consisted of one locomotive engineer, the accident conductor, and another conductor. The train consisted of 2 locomotives and 25 tank cars. Fifteen of the 25 tank cars were hauling gasoline, and the remaining 10 tank cars were hauling diesel fuel. The combination vehicle was placarded to carry hazardous materials and was carrying fuel residue at the time.

On the day of the accident, at 3:58:22 a.m., the crew began shoving the 2 locomotives and 25 tank cars about 30 to 40 railcar lengths southward from the lead track to switching track 905. The engineer was operating the locomotive, and the accident conductor was positioned on the west side of the last car's platform to protect the shoving movement. The other conductor was on the ground next to tank cars south of the crossing.<sup>3</sup> The combination vehicle was traveling on Federal Road parallel to the tracks in the same direction as train 202.

Event recorder data from the lead locomotive showed that train 202 was traveling about 8 mph (2 mph less than the maximum authorized speed of 10 mph) as it approached the highway-railroad grade crossing.<sup>4</sup> Surveillance camera video from a local business showed that the accident conductor was positioned on the end of

---

<sup>3</sup> Though the conductor was on the ground, he was not positioned at the crossing to monitor for traffic. See section 1.6 for a discussion of protection during shoving movements through crossings.

<sup>4</sup> Train 202 was operating under Watco System Special Instructions. Effective April 1, 2020.

the tank car as required by WDRL's Transportation Safety Rule T-17, Riding In or On Moving Equipment, with three points of contact (two feet on the platform and one hand on a vertical handhold). (See figure 2.) The accident conductor held onto the vertical handhold with his left hand, so that his body was partially turned away from the side of the highway-railroad grade crossing from which Federal Road traffic approaches. He was holding his lantern in the crook of his right elbow with his right hand on the radio microphone button to communicate with the locomotive engineer.



**Figure 2.** Exemplar tank car depicting the vertical handhold and platform. (Source: Transportation Safety Board of Canada.)

The combination vehicle approached the entrance to the industrial park while traveling southbound on Federal Road at the posted speed of 35 mph as train 202 approached the crossing. Surveillance camera video obtained from a local business located on Federal Road indicated that, at 4:02:23 a.m., the train approached the private grade crossing as the southbound combination vehicle was making a left turn from Federal Road onto the driveway toward the grade crossing. At 4:02:25, the combination vehicle began to cross the tracks, at which point the train was visible through the driver's window, and he issued an expletive. At 4:02:27 a.m., the train and combination vehicle collided. According to the train's event recorder, at 4:02:28

a.m. the engineer initiated an emergency brake application.<sup>5</sup> At 4:02:37 a.m., the combination vehicle and train came to rest. No hazardous material was released as a result of the accident.

The engineer called the accident conductor on the radio but did not receive a response. The engineer told the National Transportation Safety Board (NTSB) that shortly after he tried to reach the accident conductor on his radio, a manager who was monitoring the radio also tried to contact the accident conductor but did not receive a response. The manager then called the other conductor and told him to go check on the unresponsive conductor. The engineer remained on the locomotive until the yardmaster notified him about what happened, and he then secured the train. WDRL management contacted emergency services.

The engineer stated in postaccident interviews with the NTSB that just before the accident the conductor had given him a 7-railcar countdown to a stop and then the conductor said, "Stop."<sup>6</sup> The engineer stated that he could tell by the sound of the conductor's voice that something was wrong, which was why he initiated the emergency brake application.

The combination vehicle driver told the NTSB that he did not see anything unusual as he approached the left turn onto the driveway to the industrial park. He looked both ways before turning, proceeded to make the left turn, and used his mirrors to look back at his semitrailer to see that he was not going to hit the median after turning. The driver said the turn area used to be wider, but recent road construction extended the median, narrowing the area that drew his focus. The driver then looked back at the semitrailer a second time, and during this second look-back, he saw train 202 out of the corner of his eye. He said that when he saw train 202 coming, his instinct was to accelerate instead of brake, because he was partially across the grade crossing. The driver swerved to try to avoid being struck by train 202, and the collision occurred.

---

<sup>5</sup> An *emergency brake application* is the maximum brake force available and is designed to stop the train as quickly as possible. The engineer typically will only use the emergency brake application as a last resort.

<sup>6</sup> Railroad personnel commonly use railcar lengths to communicate distances during shoving movements.

## 1.2 Events Before the Accident

On October 28, 2021, the crew for WDRL train 202 reported for duty about 6:00 p.m. at the Greens Port Industrial Park. The crew conducted a job briefing and began working in the west yard until around midnight, when they took a lunch break. When they returned to work, the crew conducted another job briefing before performing the accident shoving movement.

## 1.3 Watco Dock and Rail

Watco Companies, L.L.C. (Watco) is a transportation company based in Pittsburg, Kansas. Watco is composed of four divisions: transportation, mechanical, terminal and port services, and compliance. WDRL is a subsidiary of Watco and provides switching service in the Greens Port Industrial Park in Houston, Texas. Watco also owns Watco Transportation Services, L.L.C., which operates 41 short line railroads in the United States, representing 5,500 miles of leased and owned track.

## 1.4 Gemini Motor Transport

The driver involved in the accident was employed by Gemini. Gemini, headquartered in Oklahoma City, Oklahoma, is a nationwide for-hire fuel and specialty products motor carrier that employs about 1,200 professional drivers nationwide. Gemini has more than 1,050 trucks and drivers who travel more than 100 million miles annually across the United States.

## 1.5 Highway-Railroad Grade Crossing Description

The private highway-railroad grade crossing at the accident location was just outside the gated perimeter of the Greens Port Industrial Park located near the Houston Ship Channel on property leased to Musket Corp. The industrial park contained over 30 miles of track and could store over 1,600 railcars with WDRL providing switching services.<sup>7</sup> Access control gates extended across the railroad tracks on either side of the driveway. The gates were manually operated and had to be open to allow train movement through the crossing; when open, lights on top of

---

<sup>7</sup> Title 49 *Code of Federal Regulations (CFR)* 229.5 defines *switching services* as the classification of railroad freight and passenger cars according to commodity or destination; assembling cars for train movements; changing the position of cars for purposes of loading, unloading, or weighing; placing locomotives and cars for repair or storage; or moving rail equipment in connection with work service that does not constitute a train movement.

the gate would be flashing.<sup>8</sup> The engineer stated that the gate was normally open when he was working.

The grade crossing was equipped with passive warning devices including pavement markings and an advance warning sign facing Federal Road. (See figure 3.) The grade crossing was not equipped with active warning devices (such as lights that flash only when a train is approaching or occupying a crossing) or crossing gates, nor was an employee stationed at the crossing to protect it.



**Figure 3.** Highway-railroad grade crossing at Greens Port Industrial Park (Source: Federal Railroad Administration.)

---

<sup>8</sup> The lights were not railroad equipment and were illuminated whenever the gate was open. They were not activated by the presence of the train.

## 1.6 Rules and Regulations Governing the Accident Movement

### 1.6.1 Federal Railroad Administration Regulations for Shoving or Pushing

Title 49 *Code of Federal Regulations (CFR)* 218.99(e)(4)(iv) requires that a shoving movement:

shall not enter or foul a highway-rail grade crossing or pedestrian crossing except when: (A) crossing gates are in the fully lowered position; or (B) a designated and qualified employee is stationed at the crossing and has the ability to communicate with trains; or (C) at crossings equipped only with flashing lights or passive warning devices, when it is clearly seen that no traffic is approaching or stopped at the crossing and the leading end of the movement over the crossing does not exceed 15 mph.<sup>9</sup>

### 1.6.2 General Code of Operating Rules

Watco and the Class I railroads west of the Mississippi River, most of the Class II railroads, and numerous short line railroads have adopted the General Code of Operating Rules (GCOR) to govern the operations of their railroads and enhance railroad safety.<sup>10</sup> Railroads operating under GCOR can modify the operating rules to suit their specific operations.

GCOR 6.32.1 - Providing Warnings Over Road Crossings states that when railcars are being shoved through a crossing,

an employee must be present on the ground at the crossing to provide warning until crossing is occupied. Make any movement over the crossing only on the employee's signal. Warning is not required when crossing is equipped with:

Gates that are in the fully lowered position

---

<sup>9</sup> *Foul* means the placement of rail equipment in such proximity to a highway-rail grade crossing that the rail equipment could be struck by a motor vehicle.

<sup>10</sup> The GCOR is developed by the GCOR Committee, which comprises railroad operating rules officers with a common interest in the safety of railroad employees, customers, and the public. The version of the GCOR in use at the time of the accident was the Eighth Edition, effective April 1, 2020.

or

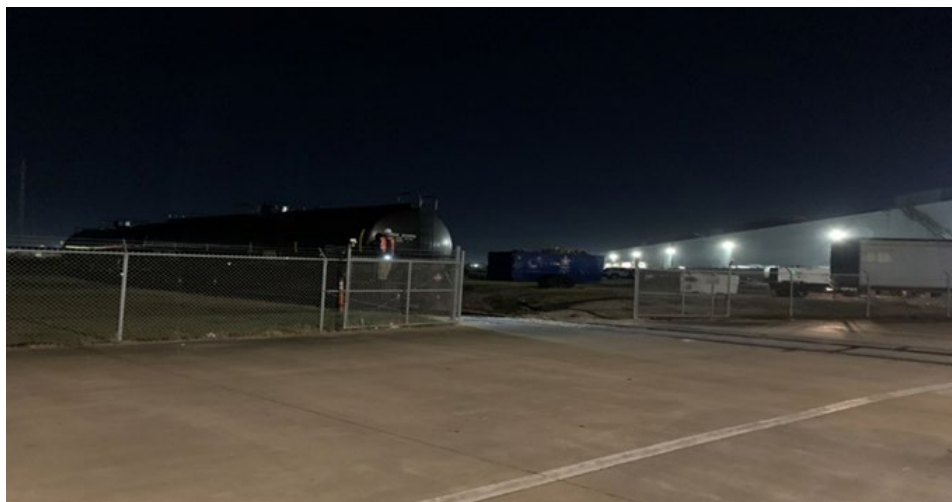
Flashing lights or passing warning devices (cross-bucks, stop signs, etc.) when it is clearly seen that no traffic is stopped at the crossing or is approaching the crossing. Leading end of shoving movements must not exceed 15 MPH over crossings. (GCOR 2020)

### 1.6.3 Gemini Motor Transport Code of Conduct

Gemini had numerous policies and procedures in place, including a Driver Code of Conduct, which outlined driver expectations, safety points, and procedures. Specifically, Gemini's Driver Code of Conduct stated that drivers should come to a complete stop at stop signs and railroad crossings and should not shift gears over tracks.

## 1.7 On-Site Observations

The NTSB conducted a partial re-enactment of the accident at the highway-railroad grade crossing near Greens Port Industrial Park about 4:00 a.m. on October 31, 2021. Multiple Gemini combination vehicles entered and exited the facility during the re-enactment. The NTSB observed that the south side of the driveway crossing the railroad tracks was well-illuminated by a private flood light located south of the highway-railroad grade crossing. (See figure 4.) The north side of the driveway did not have a flood light, and it was dark. Despite the darkness, NTSB personnel could see a person standing on a tank car moving toward the crossing.



**Figure 4.** Flood lights at the industrial park entrance.

NTSB personnel observed that entering and exiting combination vehicles, similar to the accident vehicle, were equipped with decals stating, "This vehicle STOPS at all railroad crossings." The NTSB further observed inconsistency in how the vehicles passed through the highway-railroad grade crossing: some stopped, some slowed, and others traveled through without slowing or stopping. During postaccident interviews with the combination vehicle driver, the area manager, and the vice president of Gemini, each stated that vehicles should stop at highway-railroad grade crossings on public ways where required. When the driver was asked by the NTSB about his responsibility to stop at highway-railroad grade crossings, he stated that if he had seen the train, he would have yielded.

## 1.8 Personnel Information

The accident conductor was hired on June 10, 2021, and completed all required training for the position of conductor. The accident conductor passed his last efficiency test pertaining to shoving movements on October 8, 2021. The accident conductor passed his last efficiency test pertaining to protection of a grade crossing on August 29, 2021.

The combination vehicle driver was hired by Gemini on March 5, 2019. At the time of the accident, he held a valid Texas Class A Commercial Driver's License, with a combination of tank and hazardous materials endorsement (X), which was issued in January 2020 with an expiration date of February 2025.<sup>11</sup>

## 1.9 Postaccident Toxicology Testing

In accordance with 49 *CFR* 219.201, the engineer underwent postaccident toxicology tests for alcohol and other drugs.<sup>12</sup> The results were negative for all tested-for substances, including ethanol.

---

<sup>11</sup> The X Commercial Driver's License endorsement permits a driver to drive a tank vehicle and a vehicle that transports hazardous materials.

<sup>12</sup> (a) Postaccident toxicology testing required by the Federal Railroad Administration includes testing for amphetamines, barbiturates, benzodiazepines, cannabinoids, cocaine, MDMA/MDA, methadone, opiates/opioids, phencyclidine, tramadol, ethyl alcohol, brompheniramine, chlorpheniramine, diphenhydramine, doxylamine, and pheniramine.



The Federal Aviation Administration Forensic Sciences Laboratory conducted toxicology testing on specimens from the accident conductor.<sup>13</sup> The results were negative for all tested-for substances, including ethanol.

The combination vehicle driver submitted to a Federal Motor Carrier Safety Administration postaccident drug and alcohol test following the accident, as required under 49 *CFR* 40.85.<sup>14</sup> The results were negative for all tested-for substances, including ethanol.

## **1.10 Similar Grade-Crossing Accidents**

The NTSB has investigated similar highway-railroad grade crossing accidents in which the railroad worker was killed while riding a shoving movement. In April 2020, the NTSB investigated a collision between a Union Pacific Railroad train and a combination vehicle as the train entered a public highway-railroad grade crossing outside the Proviso Yard in Northlake, Illinois (NTSB 2021). In this accident, the train and the remote-controlled locomotive collided with the front of a combination vehicle and the railroad worker operating the remote-controlled locomotive was killed. The train had proceeded into a public grade crossing with passive warning devices without stopping because the train crew determined that ground protection was not required. The combination vehicle entered the crossing at the same time, and the train and vehicle collided. The NTSB determined that the probable cause of this accident was Union Pacific Railroad's allowance of train movement through a grade crossing without first stopping the train to provide warning. Also contributing to the accident was the combination vehicle driver's failure to stop for the train as he approached the public highway-rail grade crossing.

The NTSB is currently investigating another similar accident, which occurred on March 3, 2023, when a Norfolk Southern Corporation train and a dump truck collided as they simultaneously entered a private highway-railroad grade crossing with

---

<sup>13</sup> For additional information on medical and pathological information, including postaccident toxicology testing, please see the Medical Factual Report.

<sup>14</sup> Postaccident toxicology testing for ethanol was conducted in accordance with 49 *CFR* 382.303(a) and postaccident toxicology testing for controlled substances, to include marijuana, cocaine, amphetamines, opiates, and phencyclidine, was conducted in accordance with 49 *CFR* 382.303(b).

passive warning devices in Cleveland, Ohio (NTSB 2023).<sup>15</sup> In this accident, the conductor was riding on the end platform of the lead railcar during a shoving movement in the Cleveland-Cliffs Incorporated steel plant when he was pinned between the railcar he was riding and the dump truck during the collision. This investigation is still ongoing.

## **1.11 Postaccident Actions**

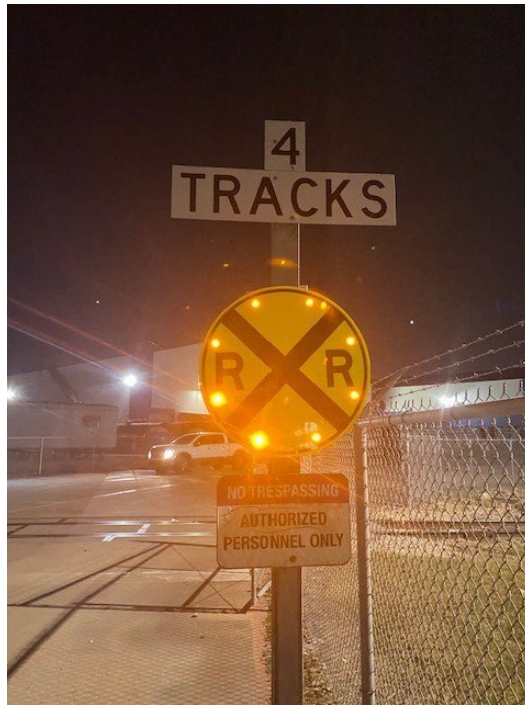
### **1.11.1 Watco**

Five days after the accident, Watco issued General Order No. 02-21, modifying their GCOR 6.32.1 rule to remove the exception allowing train crews to proceed through highway-railroad grade crossings with passive warning devices without ground protection when the crew sees no traffic approaching the crossing or stopped at the crossing. Thus, train crews must be on the ground to provide protection unless crossing gates are fully lowered. The rule change applied to Watco's 41 short line railroads throughout the United States.

WDRL also equipped the private highway-railroad grade crossing's advance warning signage with LED (light-emitting diode) lights. (See figure 5.) The intent was to make the signage more visible to truck drivers who enter the driveway that intersects with the private highway-railroad grade crossing. Further, WDRL conducted assessments to identify other crossings within the Greens Port Industrial Park that could benefit from this added protection.

---

<sup>15</sup> The preliminary report for the Cleveland accident is available at: <https://www.nts.gov/investigations/Pages/RRD23LR007.aspx>. The investigation is ongoing.



**Figure 5.** Highway-railroad grade crossing signage with LED lights.

### **1.11.2 Gemini Motor Transport**

Following the accident, Gemini management communicated the policy to stop at all grade crossings to drivers shortly after the accident and reiterated the mandate at the quarterly safety meeting during the review of the Gemini Driver Code of Conduct. Further, this policy is discussed with all new drivers during their training and on supervised rides.

## 2 Analysis

### 2.1 Introduction

On October 29, 2021, about 4:02 a.m. local time, a WDRL conductor was killed while performing a shoving movement in Greens Port Industrial Park in Houston, Texas. The accident conductor was riding on the west side of the end platform of the lead railcar of train 202 during a shoving movement when he was pinned between the train he was riding and combination vehicle as the train and vehicle simultaneously entered the private highway-railroad grade crossing with passive warning devices.

This analysis discusses the circumstances of the collision and evaluates the following safety issue:

- The need to prohibit railroad employees from riding shoving movements through highway-railroad grade crossings equipped only with flashing lights or passive warning devices without ground protection. (Section 2.3.)

Having completed a comprehensive review of the circumstances that led to the accident, the investigation established that the following factors did not contribute to its cause:

- *Training and qualifications of the accident conductor and the combination vehicle driver.* The NTSB's review of training records found that the accident conductor and combination vehicle driver were qualified to perform their assigned duties.
- *Combination vehicle driver, engineer, and accident conductor toxicology.* Testing results were negative for all tested-for substances, including ethanol.
- *Engineer and conductor performance.* According to event recorder data, the engineer operated the train in a manner consistent with normal train handling methods expected during the shoving movement. The NTSB found the actions of the accident conductor and the other conductor were appropriate before and at the time of the accident.

Therefore, the NTSB concludes that none of the following contributed to the accident: (1) training and qualifications of the accident conductor and the combination vehicle driver, (2) alcohol or other drug impairment, and (3) performance of the engineer and conductors.

## 2.2 Accident Summary

The accident occurred at a private highway-railroad grade crossing in Greens Port Industrial Park; the crossing was equipped with passive warning devices that included pavement markings on the driveway and advance warning signage facing Federal Road. The crossing did not have gates.

Train 202 was traveling about 8 mph as it approached the grade crossing with the accident conductor riding on the end platform of the leading railcar. At the same time, the Gemini combination vehicle was approaching the driveway to turn into Greens Port Industrial Park, traveling on Federal Road parallel to the train. The combination vehicle then made a left turn from Federal Road onto the driveway of the industrial park, began to cross the railroad tracks without stopping, and was struck by the train. Although required by the Gemini Driver Code of Conduct to come to a complete stop at railroad crossings, and aware of the requirement, the combination driver did not stop.

The combination vehicle driver told the NTSB he perceived difficulties with his vehicle clearing the median during the turn into the industrial park because the median had been narrowed during construction. As a result, he focused his attention on looking to the rear of the trailer instead of looking ahead for visual cues of an approaching train. It was not until the driver entered the crossing that he detected train 202; he then decided to accelerate to attempt to outrun the train. This left the accident conductor with only seconds to detect the combination vehicle in the train's path; the engineer, hearing the conductor state "stop," then applied the train's brakes. The combination vehicle and the train collided, and as a result, the accident conductor riding the lead tank car in the shoving movement was killed.

## 2.3 Protecting Railroad Workers at Highway-Railroad Grade Crossings

Title 49 *CFR* 218.99(e)(4)(iv) governs shoving and pushing movements and requires, in part, that a shoving movement not enter or foul a highway-railroad grade crossing except when a designated and qualified employee is located on the ground at the crossing and can communicate with trains; however an exception applies when a crossing is equipped only with flashing lights or passive warning devices, like the crossing in this accident, and when the crew can clearly see that no traffic is stopped at or approaching the crossing. In this case, the train may enter the crossing if the movement does not exceed 15 mph.

On the morning of the accident, the conductor was protecting the shoving movement from his position on the lead tank car; the train crew did not provide ground protection for the movement into the crossing. The conductor observed no traffic stopped at or approaching the crossing, and based on this observation, he advised the engineer to shove the train a distance of seven railcars, a movement that would cause it to occupy the crossing. Shortly thereafter, he observed a combination vehicle enter the grade crossing without stopping, and the train collided with the combination vehicle, which killed the conductor riding the lead tank car.

The NTSB has investigated two similar accidents: the April 2020 Union Pacific Railway accident in Northlake, Illinois, and the Norfolk Southern Corporation accident in March 2023 in Cleveland, Ohio. In both these accidents, the train crews had not provided ground protection for the shoving movement through passive highway-railroad grade crossings and the railroad workers riding the movement were killed.

Federal regulations allow train crews to decide whether to proceed through a crossing based on whether they observe traffic stopped at or approaching the crossing. If the vehicle driver does not detect that the train is moving toward the crossing, or if the train crew has limited visibility of approaching vehicles (both of which were the case in this accident), without ground protection, train crews and vehicle drivers may not be aware of the potential conflict at the grade crossing. The NTSB believes that ground protection provided by train crews can reduce this risk. The purpose of ground protection is to provide safety controls to assure safe movement across the grade crossing by having someone on the ground who can provide an unobstructed view to monitor traffic from both directions and relay movement information to the engineer. The NTSB concludes that requiring ground protection at passive grade crossings will assure trains do not enter the crossing until it is clearly seen by the train crew that no traffic is approaching or stopped at the crossing.

During some shoving movements, a railroad employee must be located on the end of the train to direct the movement. As this accident demonstrates, without ground protection, this position can be vulnerable because it is exposed to traffic at grade crossings and there is very little protection provided to the employee at crossings with only passive warning devices. Therefore, the NTSB recommends that the FRA revise 49 *CFR* 218.99(e)(4)(iv) to require ground protection when conducting shoving movements through highway-railroad grade crossings equipped only with flashing lights or passive warning devices.

In the United States, there are two standard operating rule books used by the railroad industry: the GCOR and the Northeast Operating Rules Advisory Committee

---

(NORAC) Operating Rules.<sup>16</sup> Watco adopted the GCOR. Before the accident, Watco followed GCOR rule 6.32.1, which is similar to 49 *CFR* 218.99(e)(4)(iv) and allows train crews to proceed through a grade crossing equipped only with flashing lights or passive warning devices without ground protection when the crew can clearly see no traffic stopped at or approaching the crossing. As a result of the accident, Watco changed their rule to eliminate the exception. This rule change applies to the 41 Watco-owned short line railroads, which account for about 6 percent of all railroads in the United States. However, GCOR rule 6.32.1 itself remains unchanged; the other railroads that adopted the GCOR continue to rely on train crew judgment as to whether it is safe to traverse a grade crossing based on their observation of traffic at the crossing without the use of ground protection. In addition to the GCOR, NORAC rule 116(5)(d)(iii) contains a similar exception, allowing train crews to make a judgment on whether ground protection is needed based on the train crew's observation of traffic at the crossing, leaving train crews and drivers at risk of a collision. Further, Canadian National Railway and Norfolk Southern Corporation have not adopted the GCOR or NORAC operating rules and instead have developed their own operating rules, which contain similar provisions. The NTSB concludes that railroads throughout the United States rely on their own operating rules, many of which allow train crews to ride shoving movements through a highway-railroad grade crossing equipped only with flashing lights or passive warning devices without the benefit of ground protection, increasing the risk of collision if the train crew or vehicle driver is not aware of or does not observe a potential conflict. Therefore, the NTSB recommends that the GCOR Committee, NORAC, Canadian National Railway, and Norfolk Southern Corporation revise their operating rules to prohibit railroad employees from riding shoving movements through highway-railroad grade crossings equipped only with flashing lights or passive warning devices unless ground protection is provided.

The American Short Line and Regional Railroad Association (ASLRRA) represents the owners and operators of short line and regional railroads throughout North America.<sup>17</sup> ASLRRA consists of more than 1,000 companies including Class II and III railroads, railroads that provide railroad switching, terminal and

---

<sup>16</sup> The NORAC Operating Rules are developed by the Northeast Operating Rules Advisory Committee and are used by Conrail, Amtrak, and several commuter and short line railroads in the northeastern United States. NORAC Operating Rules, February 1, 2018.

<sup>17</sup> The American Short Line and Regional Railroad Association, founded in 1913, serves its membership through representation in Washington, D.C., and delivers a wide range of industry services and professional development opportunities including training, meetings, and conferences.

tourist/excursion services, and companies that supply goods and services to the short line industry. Many of ASLRRRA member companies operate under the GCOR or NORAC operating rules; however, it is possible that some of the companies may have developed their own operating rule books. The NTSB concludes that ASLRRRA member companies that may have their own operating rules would also benefit from understanding the circumstances of this accident and the NTSB recommendation to require ground protection during shoving movements to protect railroad workers riding shoving movements through grade crossings equipped only with flashing lights or passive warning devices. Therefore, the NTSB recommends that the ASLRRRA advise its members of the circumstances of this accident and the NTSB recommendation to require ground protection at highway-railroad grade crossings equipped only with flashing lights or passive warning devices.



## 3 Conclusions

### 3.1 Findings

1. None of the following contributed to the accident: (1) training and qualifications of the accident conductor and the combination vehicle driver, (2) alcohol or other drug impairment, and (3) performance of the engineer and conductors.
2. Requiring ground protection at passive grade crossings will assure trains do not enter the crossing until it is clearly seen by the train crew that no traffic is approaching or stopped at the crossing.
3. Railroads throughout the United States rely on their own operating rules, which allow train crews to ride shoving movements through a highway-railroad grade crossing equipped only with flashing lights or passive warning devices without the benefit of ground protection, increasing the risk of collision if the train crew or vehicle driver is not aware or does not observe the potential conflict.
4. American Short Line and Regional Railroad Association member companies that may have their own operating rules would also benefit from understanding the circumstances of this accident and the National Transportation Safety Board recommendation to require ground protection during shoving movements to protect railroad workers riding shoving movements through grade crossings equipped only with flashing lights or passive warning devices.

### 3.2 Probable Cause

The National Transportation Safety Board determines the probable cause of the Houston, Texas, accident was the failure of the combination vehicle driver to follow the Gemini Motor Transport Driver Code of Conduct to stop the vehicle before entering the highway-railroad grade crossing. Contributing to the accident was the train's movement through a passive highway-railroad grade crossing without adequate protection.

## 4 Recommendations

### New Recommendations

As a result of this investigation, the National Transportation Safety Board makes the following new safety recommendations:

**To the Federal Railroad Administration:**

Revise 49 *Code of Federal Regulations* 218.99(e)(4)(iv) to require ground protection when conducting shoving movements through highway-railroad grade crossings equipped only with flashing lights or passive warning devices. (R-23-19)

**To the General Code of Operating Rules Committee, the Northeast Operating Rules Advisory Committee, Canadian National Railway, and the Norfolk Southern Corporation:**

Revise your operating rules to prohibit railroad employees from riding shoving movements through highway-railroad grade crossings equipped only with flashing lights or passive warning devices unless ground protection is provided. (R-23-20)

**To the American Short Line and Regional Railroad Association:**

Advise your members of the circumstances of this accident and the National Transportation Safety Board recommendation to require ground protection at highway-railroad grade crossings equipped only with flashing lights or passive warning devices. (R-23-21)

**BY THE NATIONAL TRANSPORTATION SAFETY BOARD**

**JENNIFER HOMENDY**

Chair

**BRUCE LANDSBERG**

Member

**MICHAEL GRAHAM**

Member

**THOMAS CHAPMAN**

Member

**Report Date: October 4, 2023**

## Appendixes

### Appendix A: Investigation

The National Transportation Safety Board was notified on October 29, 2021, that a WDRL conductor was killed at the Greens Port Industrial Park in Houston, Texas. The National Transportation Safety Board launched an investigator-in-charge and two investigative team members to investigate on October 29, 2021.

Parties to the investigation included Watco Dock and Rail, L.L.C., and the Federal Railroad Association.

---

## Appendix B: Consolidated Recommendation Information

Title 49 United States Code (U.S.C.) 1117(b) requires the following information on the recommendations in this report.

For each recommendation—

(1) a brief summary of the NTSB's collection and analysis of the specific accident investigation information most relevant to the recommendation;

(2) a description of the NTSB's use of external information, including studies, reports, and experts, other than the findings of a specific accident investigation, if any were used to inform or support the recommendation, including a brief summary of the specific safety benefits and other effects identified by each study, report, or expert; and

(3) a brief summary of any examples of actions taken by regulated entities before the publication of the safety recommendation, to the extent such actions are known to the Board, that were consistent with the recommendation.

### To the Federal Railroad Administration:

#### **R-23-19**

Revise 49 *Code of Federal Regulations* 218.99(e)(4)(iv) to require ground protection when conducting shoving movements through highway-railroad grade crossings equipped only with flashing lights or passive warning devices.

Information that addresses the requirements of 49 U.S.C. 1117(b), as applicable, can be found in section 1.6, Rules and Regulations Governing the Accident Movement, and section 2.3, Protecting Railroad Workers at Highway-Railroad Grade Crossings. Information supporting (b)(1) and (b)(2) can be found on pages 14-17; (b)(3) is not applicable.

### To the General Code of Operating Rules Committee, the Northeast Operating Rules Advisory Committee, Canadian National Railway, and the Norfolk Southern Corporation:

#### **R-23-20**

Revise your operating rules to prohibit railroad employees from riding shoving movements through highway-railroad grade crossings equipped only with

flashing lights or passive warning devices unless ground protection is provided.

Information that addresses the requirements of 49 U.S.C. 1117(b), as applicable, can be found in section 1.6, Rules and Regulations Governing the Accident Movement, and section 2.3, Protecting Railroad Workers at Highway-Railroad Grade Crossings. Information supporting (b)(1) and (b)(2) can be found on pages 14-17; (b)(3) is not applicable.

**To American Short Line and Regional Railroad Association:**

**R-23-21**

Advise your members of the circumstances of this accident and the National Transportation Safety Board recommendation to require ground protection at highway-railroad grade crossings equipped only with flashing lights or passive warning devices.

Information that addresses the requirements of 49 U.S.C. 1117(b), as applicable, can be found in section 1.6, Rules and Regulations Governing the Accident Movement, and section 2.3, Protecting Railroad Workers at Highway-Railroad Grade Crossings. Information supporting (b)(1) and (b)(2) can be found on pages 14-17; (b)(3) is not applicable.

## References

NTSB (National Transportation Safety Board). 2023. *Norfolk Southern Railway Conductor Fatality, Cleveland, Ohio, March 7, 2023*. Preliminary Report. Washington, DC: NTSB.

NTSB. 2021. *Union Pacific Railroad Employee Fatality, Northlake, Illinois, April 23, 2020*. NTSB/RAB-21/04. Washington, DC: NTSB.

The NTSB is an independent federal agency charged by Congress with investigating every civil aviation accident in the United States and significant events in the other modes of transportation—railroad, transit, highway, marine, pipeline, and commercial space. We determine the probable causes of the accidents and events we investigate and issue safety recommendations aimed at preventing future occurrences. In addition, we conduct transportation safety research studies and offer information and other assistance to family members and survivors for each accident or event we investigate. We also serve as the appellate authority for enforcement actions involving aviation and mariner certificates issued by the Federal Aviation Administration (FAA) and US Coast Guard, and we adjudicate appeals of civil penalty actions taken by the FAA.

The NTSB does not assign fault or blame for an accident or incident; rather, as specified by NTSB regulation, “accident/incident investigations are fact-finding proceedings with no formal issues and no adverse parties ... and are not conducted for the purpose of determining the rights or liabilities of any person” (Title 49 *Code of Federal Regulations* section 831.4). Assignment of fault or legal liability is not relevant to the NTSB’s statutory mission to improve transportation safety by investigating accidents and incidents and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report (Title 49 *United States Code* section 1154(b)).

For more detailed background information on this report, visit the [NTSB Case Analysis and Reporting Online \(CAROL\) website](#) and search for NTSB accident ID RRD22LR002. Recent publications are available in their entirety on the [NTSB website](#). Other information about available publications also may be obtained from the website or by contacting—

**National Transportation Safety Board**  
Records Management Division, CIO-40  
490 L’Enfant Plaza, SW  
Washington, DC 20594  
(800) 877-6799 or (202) 314-6551

Copies of NTSB publications may be downloaded at no cost from the National Technical Information Service, at the National Technical Reports Library search page, using product number PB2024-100101. For additional assistance, contact—

**National Technical Information Service**  
5301 Shawnee Rd.  
Alexandria, VA 22312  
(800) 553-6847 or (703) 605-6000  
[NTIS website](#)