



**HUMAN PERFORMANCE GROUP CHAIRMAN'S  
FACTUAL REPORT**

**Multiple Fatality Motorcoach Collision  
with Vertical Pole Supporting an Overhead Bridge Sign  
Bronx, NY; 03/12/2011**

**HWY-11-MH-005**  
(28 Pages)



**NATIONAL TRANSPORTATION SAFETY BOARD  
OFFICE OF HIGHWAY SAFETY  
WASHINGTON, D.C. 20594**

**HUMAN PERFORMANCE GROUP CHAIRMAN'S FACTUAL REPORT**

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**A. ACCIDENT**

LOCATION: Interstate 95 (I-95) New England Thruway, at Mile Marker 3.2, in New York, Bronx County, New York  
VEHICLE 1: 1999 Prevost H3-45 56-Passenger Motorcoach  
OPERATOR: World Wide Travel of Greater New York Ltd.  
DATE: March 12, 2011  
TIME: Approximately 5:37 a.m. EST

**NTSB #: HWY-11-MH-005**

**B. HUMAN PERFORMANCE GROUP**

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## C. DETAILS OF THE INVESTIGATION

This report provides the reader with a factual record of the behavioral, medical, operational, and environmental factors associated with the driver of the 1999 Prevost H3-45 56-Passenger Motorcoach (1999 Prevost) involved in the March 12, 2011 accident in New York, New York. Readers are encouraged to examine the Highway Group Chairman's Factual Report, The Vehicle Group Chairman's Factual Report, the Survival Group Chairman's Factual Report, and the Motor Carrier Group Chairman's Factual Report for additional factual information on this accident.

### 1. WORK/ACTIVITY HISTORY

#### 1.1. Recent Work/Activity History

Table 1 and Figure 1, summarize driver activity in the days prior to the accident and were generated based on the following sources of information:

- Two post accident interviews with the driver of the 1999 Prevost<sup>1</sup>
- The driver's work schedule provided by World Wide Travel of Greater New York, Ltd (World Wide)<sup>2</sup>
- Driver logbooks and other log information documented by the driver on a series of envelope flaps<sup>3</sup>
- Surveillance videos summary<sup>4</sup> and bus arrival/departure data from the Mohegan Sun Casino, Uncasville, CT<sup>5</sup>
- An interview with Mohegan Sun staff
- The driver's cell phone records<sup>6</sup>
- Electronic highway toll system (E-Z Pass) data from the busses used by the driver in the days leading to the accident<sup>7</sup>
- Telematics data from a car rented by the driver in the days preceding the accident<sup>8</sup>
- Medical records from a trip the driver made to a hospital emergency department in the week prior to the accident

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<sup>1</sup> See Human Performance Attachment #1: Narratives From Interviews with Accident Bus Driver

<sup>2</sup> See Motor Carrier Attachment #16: Driver's Work Schedule January 1 through March 12, 2011.

<sup>3</sup> See Motor Carrier Attachment #17: Driver Handwritten Logs

<sup>4</sup> See Human Performance Attachment #2: Surveillance Video Summary and Driver Club Card data from Mohegan Sun Casino

<sup>5</sup> See Motor Carrier Attachment #22: World Wide Bus Arrival and Departure Times

<sup>6</sup> See Human Performance Attachment #3: Bus Driver Cell Phone Records

<sup>7</sup> See Human Performance Attachment #4: E-ZPass Electronic Toll Data from World Wide

<sup>8</sup> See Human Performance Attachment #5: Rental Car Records

Table 1. Summary of driver recent work/rest history. All times in the table are expressed in Eastern Standard Time (EST).

<b>Tues 3/1/11</b>			
5:54 p.m.	Personal rental car in driver's name is picked up	Rental car records	
9:15 p.m.	Driver reports for duty at World Wide	Driver Daily Log page	
9:30 p.m.	Driver scheduled to come on duty at World Wide	Driver schedule envelope	
<b>Wed 3/2/11</b>			
2:00 a.m.	Driver arrives at Mohegan Sun in bus #255	Driver Daily Log page	
6:15 a.m.	Driver picks up passengers at Mohegan Sun in bus #255	Driver Daily Log page and driver schedule envelope	
10:30 a.m.	Driver goes off duty at World Wide	Driver Daily Log page	
5:29 p.m.	Personal rental car in driver's name is dropped off	Rental car records	
5:53 p.m.	Personal rental car in driver's name is picked up	Rental car records	
<b>Thurs 3/3/11</b>			
5:32 p.m.	Personal rental car in driver's name is dropped off	Rental car records	
9:00 p.m.	Driver schedule to come on duty at World Wide	Driver schedule envelope and Driver Daily Log page	
<b>Fri 3/4/11</b>			
1:05 a.m.	Bus #255 arrives at Mohegan Sun	Mohegan Sun arrival/departure records	
1:30 a.m.	Arrive at Mohegan Sun in bus #255	Driver Daily Log page	
5:15 a.m.	Driver picks up passengers at Mohegan Sun in Bus #255	Driver schedule envelope	
5:30 a.m.	Bus #255 departs Mohegan Sun	Mohegan Sun arrival/departure records	
6:15 a.m.	Pickup Passengers at Mohegan Sun in Bus #255	Driver Daily Log page	
8:30 a.m.	Last dropoff in New York City (NYC) with bus #255	Driver schedule envelope	
9:15 a.m.	Driver goes off duty at World Wide	Driver Daily Log page	
1:00 p.m.	Driver goes on duty at World Wide	Driver Daily Log page	
1:15 p.m.	Driver scheduled to come on duty at World Wide	Driver schedule envelope	
5:15 p.m.	Driver arrives at Mohegan Sun in bus #907	Driver Daily Log page	

10:00 p.m.	Driver scheduled to pick up passengers at Mohegan Sun	Driver schedule envelope
10:15 p.m.	Driver picks up passengers at Mohegan Sun in bus #907	Driver Daily Log page

### Sat 3/5/11

1:30 a.m.	Arrive in NYC in bus #907	Driver Daily Log page
1:30 a.m.	Last drop-off in NYC with bus #907	Driver schedule envelope
6:15 p.m.	Driver comes on duty to take bus #237 to Mohegan Sun	Driver Daily Log page
6:15 p.m.	Driver scheduled to come on duty and pickup bus #237	Driver schedule envelope
10:20 p.m.	Bus #237 arrives at Mohegan sun	Mohegan Sun arrival/departure records

### Sun 3/6/11

3:30 a.m.	Driver picks up passengers at Mohegan Sun in Bus #237	Driver schedule envelope
3:45 a.m.	Driver departs Mohegan Sun in bus #237	Driver Daily Log Page
6:30 a.m.	Driver arrives with bus #237 to World Wide	Driver Daily Log page
6:45 a.m.	Last drop-off in NYC with bus #237	Driver schedule envelope
6:44 p.m.	Driver visits emergency department with complaint of pain in right knee/thigh	Hospital records

### Mon 3/7/11

	Driver off duty all day	Driver Daily Log page
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### Tues 3/8/11

7:00 p.m.	Driver awoke at his home	Driver interview
9:00 p.m.	Driver arrived at World Wide Tours and commenced trip to Mohegan Sun	Driver interview
9:30 p.m.	Scheduled on-duty time for Driver at World Wide Tours	Driver schedule envelope
10:30 p.m.	Driver scheduled to pick up passengers in Flushing, Queens NY in bus #256	Driver schedule envelope

### Wed 3/9/11

12:05 a.m.	Bus #256 exits the New Rochelle tollbooth	E-Z Pass statement
1:50 a.m.	Bus #256 "A" (arrive Mohegan Sun)	Envelope top
6:05 a.m.	Outgoing cell phone call (40s)	Cell phone records
6:15 a.m.	Driver scheduled to pick up passengers at Mohegan Sun for return trip to NYC in bus #256	Driver schedule envelope
6:30 a.m.	Bus #256 "L" (leaves Mohegan sun)	Envelope top

9:30 a.m.	Driver scheduled to drop off passengers in Flushing, Queens, NY in bus #256	Driver schedule envelope
9:30 a.m.	Bus #256 at Main and Franklin Avenue	Envelope top
Between 9:00-10 a.m.	Driver arrived back at World Wide after bus trip to Mohegan Sun	Driver interview
Between 9:30 and 10:30 a.m.	Driver went to bed at his home	Driver interview
11:05 a.m.	Personal rental car in driver's name is picked up	Rental car records
	Numerous incoming and outgoing cell phone calls between 9:30 a.m. and 3:00 p.m. Longest period of nonuse was between 1:36 and 3:00 p.m.	Cell phone records
3:00 p.m.	Driver wakes up at his home	Driver interview
9:00 p.m.	Scheduled on-duty time for Driver at World Wide bus #256	Driver schedule envelope
9:00 p.m.	Driver reports to work at World Wide	Driver interview
9:15 a.m.	Bus #256 "L" (leaves World Wide)	Envelope top
10:00 p.m.	Driver scheduled to pick up passengers in Flushing, Queens NY in bus #256	Driver schedule envelope
11:24 p.m.	Bus #256 exits the New Rochelle tollbooth	E-Z Pass statement

**Thurs  
3/10/11**

1:00 a.m.	Driver arrives at Mohegan Sun Casino	Driver interview
1:15 a.m.	Bus #256 "A" (arrive Mohegan Sun)	Envelope top
1:20-1:25 a.m.	Driver goes to sleep in bus at Bear Mount parking lot	Driver interview
3:15 a.m.	Driver awakens in bus	Driver interview
5:15 a.m.	Driver scheduled to pick up passengers at Mohegan Sun for return trip to NYC in bus #256	Driver schedule envelope
5:30 a.m.	Bus #256 "L" (leaves Mohegan sun)	Envelope top
8:30 a.m.	Driver scheduled to drop off passengers in Flushing, Queens, NY in bus #256	Driver schedule envelope
8:58 a.m.	Bus #256 "garage"	Envelope top
9:00-9:30 a.m.	Driver returns to World Wide tours	Driver interview
10:00 a.m.	Driver goes to bed at his home	Driver interview
10:15 a.m. - 12:03 p.m.	Numerous incoming and outgoing cell phone calls between 10:15 a.m. and 12:03 p.m. Possible other calls/texts thereafter	Cell phone records
3:39 p.m.	Incoming cell phone call (24s)	Cell phone records
4:00 p.m.	Driver awakens at his home	Driver interview
9:30 p.m.	Scheduled on-duty time for driver at World Wide	Driver schedule envelope

9:30 p.m.	Driver reports to work at World Wide	Driver interview
9:45 p.m.	Bus "L" (leaves World Wide)	Envelope top
10:30 p.m.	Driver scheduled to pick up passengers in Flushing, Queens NY in bus #574	Driver schedule envelope
11:52 p.m.	Bus #574 goes through the Bronx Whitestone Bridge tollbooth	E-Z Pass statement

### **Fri 3/11/11**

1:50 a.m.	Bus "A" (arrives at Mohegan Sun)	Envelope top
1:56 a.m.	Bus #574 arrives at Mohegan Sun Casino	Interview with Mohegan Sun staff
6:15 a.m.	Driver scheduled to pick up passengers at Mohegan Sun for return trip to NYC in bus #574	Driver schedule envelope
6:15 a.m.	Driver departs Mohegan Sun Casino en route to NYC	Driver interview
6:30 a.m.	Bus "L" (leaves Mohegan Sun)	Envelope top
6:30 a.m.	Bus #574 departs Mohegan Sun Casino	Interview with Mohegan Sun staff
8:30 a.m.	Driver arrives back at World Wide Tours in Brooklyn, NY	Driver interview
8:56 a.m.	Bus #574 goes through the Bronx Whitestone Bridge tollbooth	E-Z Pass Statement
9:30 a.m.	Driver scheduled to drop off passengers in Flushing, Queens, NY in bus #574	Driver schedule envelope
9:50 a.m.	"Garage"	Envelope top
11:00 a.m.	Driver reports going to sleep at his home	Driver interview
11:00 a.m. - 4:00 p.m.	Numerous incoming and outgoing cell phone calls. Longest period of non-use was 39 minutes between 11:38 a.m. and 12:17 p.m.	Cell phone records
4:00 p.m.	Driver reports awakening at his home.	Driver interview
6:15 p.m.	Driver reports to work at World Wide	Driver interview
6:15 p.m.	Scheduled on-duty time for Driver at World Wide	Driver schedule envelope
7:15 p.m.	Driver scheduled to pick up passengers in NYC on bus #259	Driver schedule envelope
7:40 p.m.	Driver arrives at first pickup at Bowry in bus #259	Driver interview
8:45 p.m.	Bus #259 goes through the New Rochelle tollbooth	E-Z Pass statement
10:30 p.m.	Bus #259 arrives at Mohegan Sun Casino	Driver interview
10:36 p.m.	Bus #259 pulls into bus bay #16 at Mohegan Sun Casino	Casino video summary
10:54 p.m.	Bus #259 pulls into Bear Mount lot at Mohegan Sun Casino	Casino video summary
11:46 p.m.	Bus #259 returns to bus bay	Casino video summary

11:55 p.m. Bus #259 returns to Bear Mount lot Casino video summary

**Sat 3/12/11**

3:17 a.m.	Incoming cell phone call (32s)	Cell phone records
3:19 a.m.	Bus #259 departs Bear Mount Lot	Casino video summary
3:20 a.m.	Driver awakened by phone call from tour guide at Mohegan Sun, Casino	Driver interview
3:30 a.m.	Driver scheduled to pick up passengers at Mohegan Sun for return trip to NYC in bus #259	Driver schedule envelope
3:48 a.m.	Bus #259 departs bus bay at Mohegan Sun	Casino video summary
5:37 a.m.	Accident Occurs	

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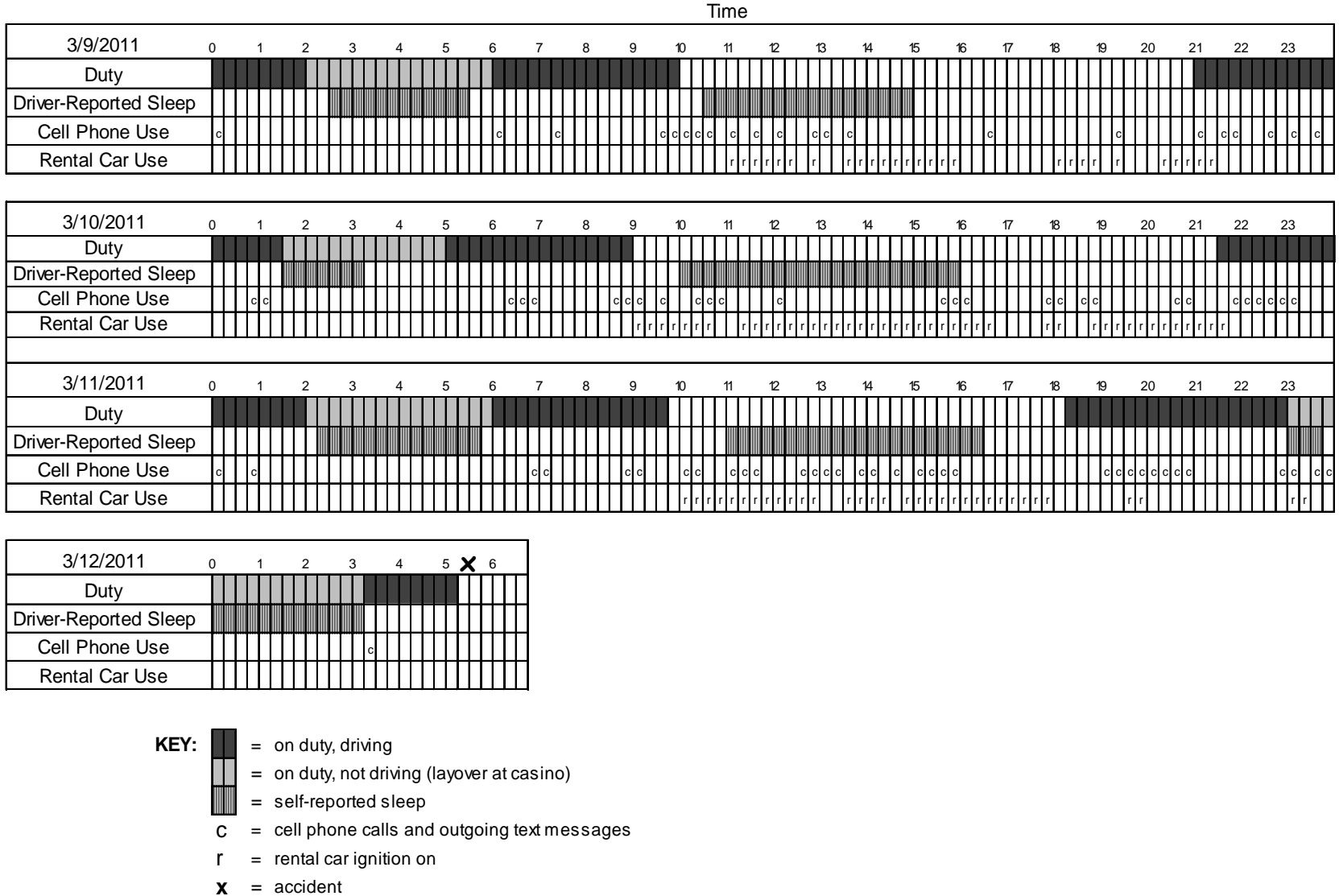


Figure 1. Activity history for the driver involved in the March 12, 2011 bus accident in New York, New York (HWY11MH005).

## 1.2. Cell Phone

Figure 1 provides information from the driver's cell phone records detailing when the driver's cell phone was used to for voice calls and outgoing text messages between midnight on March 9, 2011 and the time of the accident on March 12. An investigator submitted questions to the driver through his attorney to determine whether others may have used the driver's cell phone or rental car during the three days leading to the accident, but no response was provided by the driver or his attorney. A review of outgoing cell phone calls showed that several of the numbers dialed during the driver's driving periods were identical to numbers called during periods when he self reported being asleep. Additional factual information about the driver's use of his cell phone is provided in section 3.4.1.

Additional cell phone location data was obtained by the New York State Police and was used to plot time/location maps showing the location of the driver's cell phone when it was in use. The maps<sup>9</sup> show that on several occasions during the driver's self reported sleep periods, the driver's phone was not at his home, but was at a variety of locations in New York City and Nassau County, New York.

## 1.3. Rental Car<sup>10</sup>

The driver had a membership with Zipcar, a car sharing service since February 13, 2011.<sup>11</sup> According to Zipcar policies, members must be 21 years old (or 18 years old for members affiliated with certain universities), have a valid driver's license for at least one year, and be subjected to driving record review before being accepted as a member.<sup>12</sup> Rentals are charged on an hourly or daily basis. A certain mileage allotment is provided depending on the rental period, and members must pay extra fees if they exceed the allotment. The service allows members to reserve cars by telephone or internet and the vehicles are located in public garages and parking lots. When a member places a reservation, a radio frequency identification (RFID) card reader in the car windshield is programmed to open the car when the user places his/her card in front of the windshield. All current members are authorized to drive the club vehicles; however, once a reservation is placed, the reserving member's card is the only one that can access the vehicle. In the case of the accident driver, there were no other drivers associated with (i.e. billed to) his account.

The most recent vehicle use on the accident driver's account prior to the accident began on Wednesday, March 9. On that day, records show that a 2010 Ford Escape was picked up at 11:05 a.m. in Brooklyn, New York. The car was originally scheduled to be returned on March 10 at 11:00 a.m. However, on March 10 at 6:30 a.m., the rental was renewed for an additional day. Again on March 10 at 7:53 p.m., an additional day was added to the rental.

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<sup>9</sup> See Human Performance Attachment #3: Bus Driver Cell Phone Records

<sup>10</sup> See Human Performance Attachment #5: Rental Car Records

<sup>11</sup> The driver had also applied to be a Zipcar member in 2010, but was rejected for failing to pay the application fee.

<sup>12</sup> According to a Zipcar representative, the driver's record was approved by a member services agent. Zipcar does not retain copies of driving records and they no longer had access to the original records that were requested.

The car rental ended on March 12, 2011 at 8:46 a.m. During the 3 day period of the rental, the car was driven 228.2 miles.

Zipcar provided NTSB with data from a telematics unit that was installed on the Ford Escape. The telematics unit was designed to transmit data to a computer server<sup>13</sup> at regular intervals and whenever certain trigger events occurred (ignition on/off and doors locked/unlocked). The system did not track the vehicle location but rather tracked the number of miles driven by the car at the beginning and end of a reservation. Data from the telematics unit indicating when the car ignition was “on” is available in the accident docket (Human Performance Attachment #5: Rental Car Records) and is depicted graphically in Figure 1. The records indicate that the rental car was in use nearly continuously during the accident driver’s off duty periods during the three days leading to the accident, but was rarely in use when the accident driver was driving the bus or at the casino. Zipcar also reported that during the 3-day rental, the in-vehicle credit card that may be used to pay for fuel was not used, and the car’s E-Z pass transponder was not activated by any tolls.

#### 1.4. Long Term Work/Activity History

Based on the driver’s work schedules provided by World Wide, in the 70 days up to and including the day of the accident, the driver:

- Worked 46 night shifts of approximately 12 hours. Those shifts commenced between 6:15 p.m. and 9:30 p.m.
- Worked 2 daytime shifts (i.e., inverted from his normal schedule)
  - On January 31, 2011, he drove to Cambridge, MA beginning at 4:30 a.m. and returning at 11:00 p.m.
  - On March 4, 2011, he drove to Mohegan Sun beginning at 1:15 p.m. and returning at 1:30 a.m.
- Worked one multi-day trip to Rochester, NY beginning at 4:15 a.m. on February 18, 2011 and returning 11:55 p.m. on February 20, 2011
- Had 18 “days off” of at least 24 hours
- Had no more than 6 continuous days “on” without a day “off”

## 2. **MEDICAL FACTORS**

### 2.1. Commercial Driver Fitness Determination Exam for Employment with World Wide

Commercial drivers in the United States are required by the Federal Motor Carrier Safety Regulations (FMCSRs) to be medically certified as physically qualified for commercial vehicle operation.<sup>14</sup> According to World Wide, the company contracts with HealthCor of

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<sup>13</sup> The centralized server clocks are synchronized using Network Time Protocol (NTP) and are reported in Greenwich Mean Time (GMT). The in-vehicle clocks are synchronized with the server clock twice per month.

<sup>14</sup> 49 Code of Federal Regulations §391.41.

Maspeth, NY for all of their drivers' medical examinations and random drug and alcohol screenings. The medical director of HealthCor, Dr. Joseph Ciuffo, is a Medical Officer certified by the American Academy of Medical Review Officers.<sup>15</sup> The driver was sent to HealthCor by World Wide in November 2010 when he was a prospective employee.

Commercial driver fitness examinations result in one of four outcomes with respect to medical certification:

- The driver is found to meet the standards in 49 CFR §391.41 and is given a 2-year certificate;
- The driver is found to meet the standards, but requires periodic evaluation for one or more conditions and is qualified for 3 months, 6 months, or 1 year;
- The driver is temporarily disqualified due to a condition or medication; or;
- The driver is found to not meet the standards.

The driver was qualified for a 2-year certificate on November 18, 2010.

#### 2.1.1. General Health/Medical History on Fitness Determination Exam

The driver's height and weight were recorded as 68 inches and 240 pounds, which corresponds to a BMI (Body Mass Index) of 36.5. The U.S. Centers for Disease Control and Prevention classifies any BMI of over 30 as "obese".<sup>16</sup> In the health history section, the box labeled "no" was checked for all listed conditions, including "sleep disorders, pauses in breathing while asleep, daytime sleepiness, loud snoring." The section that asks the driver to list all medications, including over-the counter medications used regularly or recently, was left blank. The driver's blood pressure was recorded as 124/80 and his pulse rate was recorded as 70. In the Urine Specimen section, the specific gravity was listed as 1.025, and the fields for protein, blood, and sugar were all marked negative. In the physical examination section of the form, no abnormalities in any of the driver's body systems<sup>17</sup> were listed.

#### 2.1.2. Vision

With respect to his vision, the driver was listed as having uncorrected visual acuity of 20/20 in the right eye, the left eye, and in both eyes combined. The driver's horizontal field of vision was recorded as 90 degrees in the right eye and left eye; the horizontal field of vision with both eyes was recorded as 180 degrees. The box indicating that the driver could distinguish between red, green, and amber colors was checked "yes".

#### 2.1.3. Hearing

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<sup>15</sup> See Human Performance Attachment #6: Dr. Joseph Ciuffo Interview Transcript

<sup>16</sup> [http://www.cdc.gov/healthyweight/assessing/bmi/adult\\_bmi/index.html](http://www.cdc.gov/healthyweight/assessing/bmi/adult_bmi/index.html) (accessed July 12, 2011)

<sup>17</sup> General appearance, eyes, ears, mouth and throat, heart, lungs and chest, abdomen and viscera, vascular system, genitor-urinary system, extremities, spine and other musculoskeletal, and neurological.

With respect to the driver's hearing, the driver was documented to be able to hear a forced whisper with both the right and left ears at a distance of 5 feet.

#### 2.1.4. Controlled Substances Test

As part of his application for employment with World Wide, the driver underwent a Department of Transportation pre-employment controlled substances test. The test screened the urine for the presence of marijuana, cocaine, amphetamines, opiates, and phencyclidine. A review of the laboratory report from the test indicated that the results were negative.

#### 2.2. Prior Commercial Driver Fitness Exam Forms

Records were obtained from two additional Commercial Driver Fitness Exams conducted in May 2006 and May 2007 during the driver's employment with Coach USA. Table 2 summarizes results from those exams as well as the driver's pre-employment exam conducted for World Wide in November 2010.

Table 2. Commercial Driver Fitness Exam Summaries from Accident Driver

Date of Exam	5/17/2006	5/17/2007	11/18/2010
Driver Height (inches)	67	69	68
Driver Weight (lbs)	222	220	240
Driver Identified Health History	None	None	None
Blood Pressure	128/78	126/80	124/80
Pulse Rate, Regular	76	76	70
Pulse Rate, After Exertion	98	80	na
Urine, Specific Gravity	1.026	1.025	1.025
Urinalysis Test for Protein, Blood and Sugar	Negative	Negative	Negative
Right Eye, Uncorrected Vision	20/25	20/40	20/20
Left Eye, Uncorrected Vision	20/25	20/30	20/20
Both Eyes, Uncorrected Vision	20/20	20/30	20/20
Right Eye, Field of Vision	70	85	90
Left Eye, Field of Vision	70	85	90
Distinguish Red/Green/Amber	Yes	Yes	Yes
Monocular Vision	No	No	No
Right Ear, Distance at which Forced Whisper Heard	>5 ft	5 ft	5 ft
Left Ear, Distance at which Forced Whisper Heard	>5 ft	5 ft	5 ft
Body Systems Abnormalities	None	None	None

### 2.3. Driver Self-Report of Health

In his interview, the driver stated that he is in good health overall. He noted that he has asthma but hasn't had problems with it for a long time. The driver also reported that that he has good vision, doesn't have glasses and had no vision problems on the night of the accident. He stated that his hearing is ok but that a long time ago a doctor said his "low and high tones weren't good," and told him not to listen to music too loud.

The driver reported that he does not drink alcohol and never has; and that he does not smoke or use drugs. When asked about prescription medicines, he said the only medicine he was taking around the time of the accident was some ibuprofen for his knee. He said that during the wintertime, he had injured his knee in a fall, and there was swelling. He went to the emergency room at Kingsbrook (see details in Section 2.4) and the doctor told him to take ibuprofen and Tylenol with codeine. The driver said he had no knee pain in the week before the crash, but that his knee was swollen and he was limping. He said that driving did not

make it worse and said the last time he took medicine for it was a few days after the injury happened.

With respect to his sleep, he stated that in general it was good. He said, "I go right to bed and drop." He said his doctor never told him he has sleep disorder. He said his wife said he only snores when he is tired, such as if he does strenuous work around the house. He said that upon waking he generally feels good. The driver reported that on his days off, he generally went to bed around 8:00-9:00 p.m. and got up between 11:00 a.m.-noon. On work days, he said he slept during the day. He said he generally got home from work around 9:00 a.m. at which time he generally went to bed and slept well. He said that the daylight did not bother him because he drew the shades. According to the driver, his wake time depended on which run he was assigned. For example, if he had the 6:15 p.m. run, he said he would get up around 4:30-5:00 p.m.

The driver also reported that he slept on the bus while the passengers were at the casino. He said that he would try to select a parking space away from overhead lights, and then he would lie across the seats, and sleep. He reported that he did not have any problems sleeping on the bus and that he didn't use an alarm clock at home or while sleeping on the bus. The driver stated that he felt okay when the tour guide woke him up on the morning of the accident.

When asked his shirt collar size (i.e., neck size), he replied 17.5 inches. The driver later looked at a dress shirt he had at his home and said that the label read 18 5/7". He stated that at the time of the accident, he was 5' 8" tall and weighed 240 lbs.

#### 2.4. Emergency Department Visit on March 6, 2011

Records from the driver's March 6, 2011 visit to the Kingsbrook Jewish Medical Center in Brooklyn, NY were obtained. According to those records, the driver arrived at 6:44 p.m. that evening with a complaint of "pain to right thigh." According to the physician's notes, the driver reported injuring his right knee about two weeks prior and had fallen earlier in the day before his visit to the emergency department. His x-rays were negative for acute fracture, but "small suprapatellar joint effusion" was noted. The driver received prescriptions for ibuprofen and acetaminophen with codeine. He was told to follow up with an orthopedic clinic within 1-2 days.

#### 2.5. Other medical records

Other medical records were obtained from the following sources and were reviewed by the MTSB Medical Officer, but were not deemed to be relevant to the present investigation.

- The pharmacy where the driver filled the prescription from the March 6, 2011 emergency room visit
- Two other visits to Kingsbrook Jewish Medical Center in February 2010 and January 2009
- The hospital where the driver was treated after the accident
- The driver's self-identified primary care physician

- The driver's self-identified neighborhood pharmacy
- Podiatry records
- Dental records

## 2.6. Medicines in Driver Possession

A bag belonging to the driver of the 1999 Prevost was found in the bus and was inventoried by NTSB staff on March 19, 2011 at New York State Police (NYSP) Troop K in Salt Point, NY. The bag contained two bottles of the following prescription medications:

-Generic for Tylenol/Codeine Tab 300-30: Date Written: March 6, 2011. Date filed: March 8, 2011, Instructions on bottle: Take one tablet by mouth every 4 hours as needed for pain. Qty: 12. The bottle contained 8 white round pills with the label "3" stamped on one side and the label "93 150" stamped on the other.

-Generic for Motrin, Ibuprofen, Tab 1 600 mg, Date Written: March 6, 2011. Date filled: March 8, 2011, Qty: 30. The bottle contained 26 oval shaped pills with the label "6I" stamped on one side and no label on the other.

## 2.7. Post Accident Toxicology and Medical Screenings

After the accident, a portable breath test (PBT) was conducted, and blood samples were collected from the driver in the hospital. No urine samples were collected, and no post accident medical screenings, such as a sleep study, were conducted.

### 2.7.1. Breath Testing

The driver reported that shortly after the accident, a police officer asked him to breathe into a tube and that the device used registered a reading of "0". Investigators interviewed the officer who performed the PBT on the bus driver and confirmed that the results were negative.<sup>18</sup>

### 2.7.2. Blood Testing

On the morning of the accident, NTSB investigators contacted the NYSP and requested that any blood or urine samples taken from the driver be "split" with the NTSB for toxicological testing purposes. NTSB staff were later informed that an additional blood sample was obtained from the driver from the NYSP and would be provided to NTSB. According to hospital records from St. Barnabas Hospital in Bronx, NY, where the driver was treated, the driver was noted to have had blood drawn for the NYPD at 10:25 a.m., by which time the records already noted two doses of morphine having been administered to the driver.

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<sup>18</sup> See Human Performance Attachment #7: Interview with Detective Rivera Regarding Bus Driver Portable Breath Test



Also on the day of the accident, NTSB made a request to St. Barnabas Hospital for any unused diagnostic blood or urine samples collected from the driver. The Medical Director of the hospital agreed to reserve the samples for NTSB testing. However, subsequently, the New York District Attorney's office obtained a search warrant for the blood samples, and took possession of all blood specimens. The District Attorney sent all of the specimens to the Westchester County Department of Laboratories and Research and later consented to having that laboratory send one untested specimen to the Civil Aerospace Medical Institute (CAMI) for further testing at the request of the NTSB.<sup>19</sup>

#### 2.7.2.1. Blood Tests Conducted by Westchester County

The Westchester County Department of Laboratories and Research tested for the presence of numerous illicit and licit drugs. The driver's blood tested negative on alcohol and on all other substances tested.<sup>20</sup>

#### 2.7.2.2. Blood Tests Conducted by the Civil Aerospace Medical Institute (CAMI)

On April 19, 2011, CAMI reported receiving 2 tubes of blood from the Westchester County Laboratory.<sup>21</sup> Each tube contained about 8.0 grams of blood and according to the labeling on the box; it was obtained from the driver on the day of the accident at 1:40 p.m. According to the CAMI toxicology report<sup>22</sup>, no putrefaction of the sample had occurred. CAMI personnel conducted a complete drug evaluation, which screens for a wide variety of illicit, prescription, and over-the-counter medications. According to a CAMI Forensic Toxicology Report dated May 10, 2011,

*“Immunoassay and/or chromatography are used to screen for drugs. GC/Mass Spec, HPLC/Mass Spec, or GC/FTIR is used to confirm most positive results. Concentrations (ug/mL) at or above those in ( ) can be determined for, but not limited to, the following drugs: amphetamines (0.010), opiates (0.010), marijuana (0.001), cocaine (0.020), phencyclidine (0.002), benzodiazepines (0.030), barbiturates (0.060), antidepressants (0.100), and antihistamines (0.020). For comprehensive information concerning all drugs detected by the laboratory, see the CAMI Drug Information Web Site: <http://jag.cami.jccbi.gov/toxicology/>.”*

The report further noted “No Drugs listed above detected in blood.”

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<sup>19</sup> Although NTSB requested all remaining samples, only one sample, drawn at 1:40 p.m. on the day of the accident, was sent.

<sup>20</sup> See Human Performance Attachment #8: Westchester County Toxicology Results

<sup>21</sup> Email from Dr. Arvind Chaturvedi dated 4/19/11.

<sup>22</sup> See Human Performance Attachment #9 – Civil Aerospace Medical Institute Toxicology Results

### 3. TASK FACTORS

#### 3.1. Accident Trip

In his interview, the driver stated that he arrived at work at 6:15 p.m. on Friday, March 11. He said that something had happened with another bus—he believed it was a flat tire—and that they had switched his original bus with another bus. Once he was assigned another bus, he conducted his pre-trip inspection, departed to his first stop on Bowery, and loaded passengers. He said he was supposed to be there at 7:30 p.m. but got there around 7:40 p.m. because the Manhattan Bridge traffic was heavy. He then drove to the next stop at 100 Island Street. At the Island Street stop, no passengers boarded.

The driver stated he then proceeded to the Mohegan Sun casino, arrived around 10:30 p.m. and drove to the bus stand, which is consistent with surveillance video data provided by Mohegan Sun (casino video). While the passengers were exiting the bus, he stated that he obtained a meal ticket, ordered some food, went back in the bus, drove to the Bear Mount parking area, ate, and went to sleep. He stated that about 45 minutes later the bus tour guide assigned to that trip phoned him and told him to return to the bus stand because they had misplaced their money book. He then drove the bus back to the bus stand and he and the tour guide searched the bus to find the money book until he was told that the book had been found by someone else. The driver then drove the bus back to the Bear Mount parking lot. According to the casino video, the bus arrived back at the parking lot at 11:55 p.m. The driver stated that he parked in the exact same spot as before and went to sleep. He said he had no problems falling back asleep.

The driver stated he was later awakened by a phone call from the tour guide around 3:18-3:20 a.m. when it was time to commence the return trip. He returned to the bus stand and the passengers boarded the bus. The driver indicated that the bus departed Mohegan sun at 3:45 a.m., which is consistent with the casino video.

On the return trip, when asked about his speed, the driver stated that he was, “staying up with the flow of traffic.”<sup>23</sup> He stated that at the time of the accident, he felt good. He was driving in the middle lane through a construction zone and that there were no cars or other vehicles on his right. He said that his headlights were on and that the weather was windy but not so much as to affect the bus. He stated that he had noticed police on the side of road near some construction and that he had passed one construction zone and then another before he went into the turn.

The driver stated that a tractor trailer passed the bus on his left—he could not estimate how fast—and as it finished overtaking the bus, the truck made contact with the bus. Specifically, he stated, “a little bit of the corner of the truck tapped the [bus] bumper.” He then described

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<sup>23</sup> In the driver’s statement to the NYSP provided at 7:30 a.m. on day of the accident, the driver estimated that his speed when he was passed by the truck was 65 mph. In another statement provided to the NYSP at 6:38 p.m. on the day of the accident, the driver estimated that his speed was about 55 or 60 mph. See Human Performance Attachment #10: Bus Driver Statements to Police.

a truck part consistent with a rear under-ride guard and said that the right rear corner of the trailer/guard touched the front left corner of the bus.

The driver said that he did not remember anything after that except trying to control the bus. The driver said that his seatbelt was fastened at the time of the crash, and that he felt the bus sliding and that he felt like he slid underneath the bus. He said he thought he was still in his seat at the end of the crash but under the bus. He didn't remember how his seatbelt came off.

### 3.2. Engine Control Module

The bus was equipped with an electronic control and data storage system manufactured by Detroit Diesel engines and known as the DDEC IV ECM (ECM). The ECM stores vehicle parameters and has the capability to record trip activity, including daily, monthly, and lifetime engine data. The ECM is also capable of recording data when triggered by a "hard brake"<sup>24</sup> event. The data recorded by the ECM indicates that there was a hard brake on March 12, 2011 at 05:38:04 EST. During the 60 seconds prior to the hard brake, vehicle speed varied between 61 and 78 miles per hour. The data recorded by the ECM indicates that no braking occurred during that 60 second period. For more details about the data gathered from the ECM, please see the Vehicle Recorder Specialist's Factual Report.

### 3.3. Cruise Control and Engine Braking System

The driver stated that there were no mechanical issues with the bus during the trip to Mohegan Sun or on the return trip.<sup>25</sup> He stated that he was not using cruise control, never uses it, and did not think that the bus had cruise control. When asked about the engine braking system, the driver said that he "didn't mess with the Jake brake"<sup>26</sup>. He left it on if it was on, and off if it was off. He said he didn't know if it was on during the accident trip.

World Wide staff noted that the engine brake system switch is a rocker switch next to driver on the dashboard and would be difficult to activate accidentally. They also suggested that the engine break application has a similar sound to that of driving on rumble strips.

### 3.4. Distraction/Workload

#### 3.4.1. Cell Phone

In his interview, the driver stated that he had 3 cell phones, but only one of them was working in the days surrounding the crash. The phone he used was a personal cell phone, with a "Bluetooth wrap-around" headset, which he wore around his neck. He explained that when he gets a call, the headset vibrates on his neck. He stated that the headset also has a "magnetic" ear piece and has voice-dialing. He noted that he also has a second

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<sup>24</sup> A "hard brake event" is not necessarily indicative of a brake application. It is triggered when the calculated vehicle wheel speed decelerates at a rate greater than 7 MPH per second. When triggered, one minute of data prior to and 15 seconds of data after the event is recorded.

<sup>25</sup> For more details about the bus, please see the Vehicle Factors Group Chairman's Factual Report.

<sup>26</sup> Engine braking systems used on large vehicles are commonly referred to as "Jake brakes."

headset that looks like the kind a telephone operator uses. The driver stated that the tour guides have the bus driver cell numbers. He said he only takes work-related calls at work and that the company sometimes calls him with schedule changes.

The driver stated that he never texted while driving, but that he does send text messages in general. He said that the very last calls he received prior to the accident were from the bus tour guide who called him about missing money on the night of March 11, 2011 and who also phoned to awaken him on March 12, 2011 at approximately 3:20 a.m. He stated that at the time of the accident, he was wearing the neckpiece for his wireless phone headset, but did not have the earpiece in.

The driver's cell phone records<sup>27</sup> indicate that although the driver did not use the phone during the accident trip, he frequently used his cell phone while driving the motorcoach. During the 24-hour period before the accident, his cell phone records show that he made or received 33 voice calls during the periods when he was operating the motorcoach. The last call made from the driver's cell phone was a 15-second outbound call placed at 3:18 a.m. on March 12, 2011. There were no incoming or outgoing calls or text messages between 3:18 a.m. and the time of the accident.

#### 3.4.2. General Task/Distraction Factors

The driver noted that there were several construction zones on his route, but did not remark that they were distracting to his driving. He also noted that that the passengers generally sleep on the bus and that he is the only person awake on the bus. He said that he sometimes hears some [passenger] noise on the way to I-95 but that after a certain point, everybody is asleep.

#### 3.4.3. General Fatigue Factors

The driver reported that he is never sleepy when he drives, but also stated that he would rather drive days than nights since there is more action, more light and you are "not dead."

## 4. WITNESS INTERVIEWS AND STATEMENTS

### 4.1. NTSB Interview with Truck Driver who Witnessed the Accident<sup>28</sup>

On March 17, 2011, NTSB staff interviewed a truck driver who witnessed the accident. The driver was delivering groceries in a 2007 Freightliner tractor with an attached semitrailer from Windsor Locks, CT to Long Island, NY.

The Freightliner driver stated that on the morning of the accident, he was driving on I-95 southbound. He described the weather as clear and the traffic conditions as very light, typical for that day of the week and time of day. While travelling in the middle lane (as was

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<sup>27</sup> See Human Performance Attachment #3: Bus Driver Cell Phone Records

<sup>28</sup> See Human Performance Attachment #11: Truck Driver Witness Interview Transcript

his normal practice) near the Connecticut/New York border, a bus passed his truck on the right hand side. He described the bus as black with the word “tours” on it in gold letters. He estimated his speed was between 60 and 65 mph and that the bus was going between 70 and 75 mph. The truck driver stated that being passed by a bus was not unusual, but what drew his attention to the bus was that when it was between ½ to 1 truck lengths in front of him, it began “zig-zagging” over the white line. He described the bus as moving “deep into the breakdown lane and coming extremely close to the guard rail.” The driver stated that he witnessed the bus crossing into the breakdown lane three times within a relatively short period and he recalled thinking that the bus was going to get into an accident. Once the bus was three or four truck lengths ahead of his truck, the truck driver stated that he paid less attention to the bus and eventually lost awareness of it.

The truck driver estimated that the next time he became aware of the bus was ten to twenty minutes later; when he noticed that the bus was “up on two wheels riding the guardrail.” The truck driver stated that he saw smoke and that as he watched; the bus appeared to run out of guardrail and came to a stop. As the truck passed, the driver looked to his right and could see the undercarriage of the bus. The truck driver recalled seeing a dark colored passenger car at the left front corner of the bus, passing him at that time. The truck driver stated that he kept driving, as it was his experience that passenger cars would stop to assist.

Subsequently, he heard details about the accident in newscasts over the radio and from a phone conversation with his wife. Upon hearing what he thought were incorrect details, such as the bus being in the middle lane, he decided to return to the scene of the accident and tell the authorities what he saw.

#### 4.2. Witness Statements Made to the New York State Police (NYSP) After the Accident

Several statements were gathered by the NYSP on March 12 and 13, 2011<sup>29</sup> from bus passengers and from occupants of other vehicles who witnessed the bus or the crash that morning. NYSP obtained an additional statement on May 18, 2011 from a hot dog vendor who witnessed the bus driver in early March.<sup>30</sup> Summaries of the statements follow.

##### 4.2.1. Driver of Passenger Car Traveling Southbound on I-95

A car driver who traveling southbound on I-95 towards New York around 5:30 a.m. stated that he witnessed the crash through his rear view mirror. He stated that before the crash, the bus swerved from the middle lane across to the right hand lane, then back towards the middle lane and again toward the right hand lane at which point it tipped on its passenger side wheels and fell into the guide rail. He also said that the bus had no other vehicles around it at the time of the crash.

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<sup>29</sup> See Human Performance Attachment #12: Bus Passenger and Witness Statements to Police

<sup>30</sup> See Human Performance Attachment #13: Hot Dog Vendor Statement to Police

#### 4.2.2. Passenger in Car Traveling Southbound on I-95

A passenger in the car referenced in 4.2.1 said he witnessed a tour bus on the road shoulder “on its two right tires, sliding along the guardrail.” The witness said that he did not see any other trucks or vehicles around or near the bus at the time of the accident.

#### 4.2.3. Truck Driver Leading Convoy Traveling Southbound on I-95

A professional truck driver stated that he was leading a convoy of three trucks on I-95 Southbound and traveling in the right lane at about 55 mph. The driver stated that approximately 20 minutes after leaving Bridgeport, a “World Wide” tour bus passed the convoy at a high rate of speed and thought that the bus may have crossed the white line on the left side of the highway as he passed by. About 20 minutes later, he witnessed the bus on its side in the distance near Exit 14.

#### 4.2.4. Truck Driver Convoy Member Traveling Southbound on I-95

Another driver in the same convoy said that while he was driving in the right lane, the bus drove past him on the left in the middle lane and was going so fast that “the wind shook my truck as if I was standing still.” As it passed, he noticed on the rear the name “World Wide.” He also said that as the bus passed, the bus “was over partially into the left lane.” The driver reported that he called 911 to report the crash.

#### 4.2.5. Bus Passenger A

One of the bus passengers told police that the accident bus driver drove much different than other drivers she had ridden with. She said the ride was very bumpy and the driver often drove on the rumble strips on the shoulder of the road on both legs of the trip.

#### 4.2.6. Bus Passenger B

One of the bus passengers said that the driver was driving at a normal speed. She nodded off and didn’t remember anything except a loud bang. She woke up and found two people trying to get her out of her seat.

#### 4.2.7. Bus Passenger C

One of the bus passengers said that she had ridden with this same driver twice before and every time he was angry and a bad driver. She said “most of the time he was riding on the rumble strips,” and that, “the ride with this driver is always bumpy.”

#### 4.2.8. Bus Passenger D

One of the bus passengers said she was sleeping in the right rear of the bus was awoken twice by the right tires of the bus riding on the rumble strips. She thought the speed of the vehicle was normal highway speed.

#### 4.2.9. Hot Dog Vendor

NYSP investigators visited several of the locations where calls were placed from the bus driver's phone in the days leading to the accident. In Nassau County, New York, at a location approximately 20 miles from the accident driver's home, records indicated that cell phone calls had been placed on March 9, 2011 between 12:50 and 1:35 p.m. and on March 10, 2011 at approximately 6:09 p.m. When shown a photograph of the accident driver, a hot dog vendor who worked at that location stated that he recognized the driver as a customer whom he had served in early March. According to the vendor, the accident driver was driving a "dark blue SUV, which I believe was a Ford Escape with Zipcar on the back."

## 5. OPERATIONAL FACTORS

### 5.1. Licensing

At the time of the crash, the driver of the 1999 Prevost held a New York State Class "B" Commercial Driver's License (CDL) with a passenger endorsement and no restrictions. The license was issued in February 2010 and was scheduled to expire in December 2015. New York Department of Motor Vehicles records printed on March 12, 2011 indicate that the driver first obtained a Class B CDL in 1996, but that his driving privileges were suspended multiple times between 1996 and the accident date. See section 5.3 for additional details on the driver's suspension history.

### 5.2. Training/Experience

At the time of the accident, the driver had worked at for World Wide for approximately 4 months. In the Employment History section of his job application,<sup>31</sup> he listed previous employment as a bus driver with Coach USA of Paramus, NJ between March 2006 and June 2009. Records from Coach USA indicated that the driver was hired and began a training program with that carrier in May 2006 and subsequently started working as a bus driver for the company. In January 2007, according to records from Coach USA<sup>32</sup>, the driver received a written warning for having six "book-offs" (absences) within a 12-month period. A driver disconnect receipt filed by Coach USA to the New York State DMV on December 1, 2007 indicates that the driver was disconnected (i.e., separated from employment) from Coach USA on that date.

Additional records indicate that during his period of employment with Coach USA, the driver was also employed by the Metropolitan Transit Authority (MTA) New York City Transit for approximately 2 weeks in February 2007.<sup>33</sup> The driver was terminated after 2 weeks because he "failed to disclose a felony arrest/conviction."

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<sup>31</sup> See Motor Carrier Attachment #12: World Wide Driver Qualification File

<sup>32</sup> See Motor Carrier Attachment #13: Coach USA/Community Coach Inc Driver Qualification File

<sup>33</sup> See Motor Carrier Attachment #14: New York MTA Driver's Job Application File

In his World Wide employment application the driver also listed a job as a driver for a funeral home between August 1989 and March 2006. In his interview, he stated that his duties at the funeral home included maintenance and janitorial work as well as driving limousines and hearses.

Records from Coach USA indicate that the driver completed a 20-day training program in July 2006. The training curriculum included the following driving- and safety- related topics:

- Review of safety policy
- Drug and alcohol training and video
- Accident reporting procedures
- Hours of service training
- Driver fatigue video
- Breakdown/emergency procedures
- Video on special driving conditions/weather
- Video on space management
- Driver Vehicle Inspection Report (DVIR)
- Pre/post trip inspections
- Passing and lane changing video
- Backing video
- Intersections video
- Pedestrian awareness video
- Smith system<sup>34</sup>
- Skills test and road course

According to World Wide, drivers must meet the following criteria before being considered for employment:

- Valid New York driver's license
- Commercial driver's license with passenger endorsement
- Original Social Security card
- Minimum 3 years experience with a motor carrier
- Pass pre-employment medical and drug screening evaluations
- Pass 1 hour pre-employment road test provided by company tester

World Wide stated that after a driver was hired, their training included providing drivers with copies of three booklets on 1) Federal Motor Carrier Safety Regulations,<sup>35</sup> 2) Hours of Service,<sup>36</sup> and 3) drug and alcohol testing.<sup>37</sup> Drivers are also required to view videos

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<sup>34</sup> Smith System is a commercial driver safety and training program.

<sup>35</sup> Federal Motor Carrier Safety Regulations, Motorcoach/Bus Version, as prescribed by U.S. Department of Transportation Federal Motor Carrier Safety Administration Parts 40, 380, 382, 383, 387, 390-396, Federal Transit Authority, Part 655, J.J. Keller and Associates, 2010.

<sup>36</sup> Hours of Service, A Driver's Guide, published by J.J. Keller, Neenah, WI, 2005.



about driver fatigue<sup>38</sup> and drugs and alcohol and to learn about company policies and procedures. Drivers are also sent along with other drivers to observe 2-3 times before being asked to driver passengers solo.

In his interview, the driver confirmed that he had completed the pre-employment road test, had reviewed the training videos cited by World Wide, and had accompanied another driver on a training trip to Boston. A summary of the driver's pre-employment road test evaluation was provided by World Wide. It was conducted on the date the driver was hired. The form indicates that the driver was evaluated on numerous pre-trip and vehicle operation elements, and in the remarks, it states, "Very cautious driver. Pass."

### 5.3. Driver Licensing and Suspension History<sup>39</sup>

Information from a March 15, 2011 report from the Commercial Driver License Information System (CDLIS) and from New York Department of Motor Vehicle (DMV) Records indicate that the driver's driving privilege or license<sup>40</sup> was suspended on 18 occasions between 1987 and 2007. In 1987 and 1990, the driver was issued citations for driving without a license. The first name he provided at the time was a nickname, and the New York DMV filed the suspension under the nickname. Subsequent suspensions were recorded using the driver's given name and the two files were not reconciled until after the accident when the New York DMV was alerted by the media of the driver's nickname. A detailed account of the driver's licensing and suspension history is provided in the Motor Carrier Group Chairman's report.

### 5.4. Accident/Incident History

On Wednesday, March 9, 2011, the driver was involved in a traffic incident. He said that while en route to Flushing, he drove on the Brooklyn Queens Expressway (BQE). He said a car to his right side-swiped the bus and kept going to off to the right. It was dark outside, but he thought it was a dark colored car. He couldn't tell if it was a 4- or 2-door. He said he got off at the next exit and called the company dispatcher. He said there was no visible damage to bus, so he continued on his route.

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<sup>37</sup> Driver Alert! DOT Alcohol and Drug Testing Handbook, published by Buckley Productions, Mill Valley, CA, 2010.

<sup>38</sup> Motorcoach Driver Fatigue, FMCSA, USDOT (17m), no copyright date listed. Investigators reviewed the video, which contained information about sleep, circadian rhythms, and schedules. It also stated that sleep in a motorcoach is not good quality sleep.

<sup>39</sup> See Motor Carrier Attachment #15: Driver's License Record

<sup>40</sup> Since he did not obtain a license to drive until 1995, suspensions incurred prior to 1995 would have affected his driving privilege rather than his licensure.

## 6. ENVIRONMENTAL FACTORS

### 6.1. Accident Location

NTSB investigators used a Garmin® Global Positioning System (GPS) unit to obtain the coordinates of the accident scene. The following values were recorded:

Latitude: N 40° 53.207'  
Longitude: W 73° 48.680'  
Elevation: 64 feet  
Heading: 264°

### 6.2. Weather Data

Weather information was provided by an NTSB staff meteorologist. The closest weather reporting station was from LaGuardia Airport at an elevation 21 feet.

At LaGuardia at 5:51 a.m. EDT on the day of the accident, the following weather conditions were present:

- wind from 240 degrees at 11 knots gusting to 21 knots
- visibility unrestricted at 10 statute miles
- ceiling broken at 4,700 feet above ground level
- temperature 4 degrees Celsius (C) or 39 degrees Fahrenheit (F)
- Dew point temperature -1 degrees C or 30 degrees F
- altimeter 29.87 inches
- sea level pressure 1011.4-millibars

A review of the last 24-hours of weather indicated 0.71 inches of rain had fallen but had ended by 9:00 a.m. EDT on March 11, 2011. Conditions at the time of the accident were considered dry.

### 6.3. Astronomical Data

The astronomical conditions from the United States naval Observatory indicated the following:

Beginning of civil twilight	5:45 a.m.
Sunrise	6:13 a.m.

At 545 a.m. the Sun was 6.1 degrees below the horizon at an azimuth of 89 degrees or almost due east. The Moon was more than 15 degrees below the horizon and provided no illumination.

## 7. OTHER ISSUES

### 7.1. Driver Lounge

During a visit to the Mohegan Sun Casino, Investigators observed a driver lounge, a room with couches, a television, and a small kitchen with vending machines. In his interview, the accident driver stated that he has never been in the casino driver lounge.

### 7.2. Company Policies

When asked, World Wide indicated they did not have a formal written policy on cell phone use or seat belt use. The company also indicated they do not have a formal fatigue management policy.

### 7.3. Exemplar Motorcoach Video

On March 18, 2011, investigators used an undamaged 1998 Prevost motorcoach, identical in all major respects to the accident motorcoach to record the approach to the accident scene. The two cameras used were a Panasonic Lumix DMC-G2, supported by a speaker to the right of the driver's head (facing out the forward windshield) and an UltraHD 8GB Flip camera sitting in the front passenger row in line with the aisle seat.<sup>41</sup> Table 3 lists the time each recording began and the corresponding conditions.

The nominal speed for all conditions was 50 mph. The route taken past the accident scene began at the Exit 16 on the ramp for southbound Interstate 95 and terminated at Exit 13. Upon reaching Exit 13, the motorcoach exited and immediately re-entered the interstate heading northbound. Upon reaching exit 16, the motorcoach exited and re-entered the interstate heading southbound for the next run. This process continued until all runs were complete. The northbound trips were not recorded.

During the engine-brake-system-on condition, the driver accelerated beyond 50 mph on a few occasions and then released the accelerator so that the engine braking system would engage. The engaged brake system did not make a perceptible sound or cause perceptible vibration. During the rumble strip condition, the driver let the passenger-side wheels contact the rumble strips on the edge of the roadway several times when he felt it was safe to do so. When the wheels contacted the rumble strip, passengers on the bus heard a distinctive rumbling or buzzing sound and felt the bus vibrate.

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<sup>41</sup> See Human Performance Attachments #14-17: Exemplar Video Conditions 1-4, for the videos recorded with the Ultra HD 8 GB Flip. The videos recorded with the Lumix are not included because they are nearly identical to those recorded with the Flip.

Table 3. Video Times and Conditions

<b>Trial</b>	<b>Time</b>	<b>Camera</b>	<b>Focal</b>	<b>Lane</b>	<b>Engine Braking System</b>	<b>Traverse Rumble Strips</b>
1	0450	Lumix	14 mm	Right	No	No
1	0450	Flip	N/A	Right	No	No
2	0502	Lumix	14 mm	Right	Yes	No
2	0502	Flip	N/A	Right	Yes	No
3	0512	Lumix	14 mm	Right	No	Yes
3	0512	Flip	N/A	Right	No	Yes
4	0528	Lumix	14 mm	Center	No	No
4	0528	Flip	N/A	Center	No	No

**Attachments**

- Attachment #1: Narratives from Interviews with Accident Bus Driver
- Attachment #2: Surveillance Video Summary and Driver Club Card data from Mohegan Sun Casino
- Attachment #3: Bus Driver Cell Phone Records
- Attachment #3a: Cell Phone Location Maps
- Attachment #4: E-Z Pass Electronic Toll Data from World Wide
- Attachment #5: Rental Car Records
- Attachment #6: Dr. Joseph Ciuffo Interview Transcript
- Attachment #7: Interview with Detective Rivera Regarding Bus Driver Portable Breath Test
- Attachment #8: Westchester County Toxicology Results
- Attachment #9: Civil Aerospace Medical Institute Toxicology Results
- Attachment #10: Bus Driver Statements to Police
- Attachment #11: Truck Driver Witness Interview Transcript
- Attachment #12: Bus Passenger and Witness Statements to Police
- Attachment #13: Hot Dog Vendor Statement to Police
- Attachment #14: Exemplar Video Condition 1
- Attachment #15: Exemplar Video Condition 2
- Attachment #16: Exemplar Video Condition 3
- Attachment #17: Exemplar Video Condition 4