



U.S. DEPARTMENT
of **ENERGY**

Office of
Science

Accident Investigation of the July 1, 2026, Brookhaven National Laboratory Forklift Accident Resulting in a Serious Pedestrian Injury

October 2026



DISCLAIMER

On July 4, 2026, Juston K. Fontaine, Deputy Director for Operations, Office of Science, U.S. Department of Energy, appointed an Accident Investigation Board Chairperson with the charge to assemble a team and investigate an accident that occurred at Brookhaven National Laboratory on July 1, 2026. Due to the seriousness of the event and the injuries sustained by the individual, the appointment memorandum charged the Board to conduct the accident investigation in accordance with Department of Energy Order 225.1B, *Accident Investigations*.

The discussion of the facts as determined by the Board and the views expressed in the report do not assume and are not intended to establish the existence of any duty at law on the part of the U.S. Government, its employees or agents, contractors, their employees or agents, or subcontractors at any tier, or any other party.

This report neither determines nor implies liability.

RELEASE AUTHORIZATION

On July 4, 2026, as the Deputy Director for Operations, Office of Science, U.S. Department of Energy, I appointed an Accident Investigation Board Chairperson to investigate the accident that occurred at Brookhaven National Laboratory on July 1, 2026. I issued follow-up direction on July 6, 2026, to appoint the remainder of the Board.

The Board's responsibilities have been completed with respect to this investigation. The analysis and the identification of the direct cause, contributing causes, local and systemic root causes, Conclusions, and Judgments of Need resulting from this investigation were performed in accordance with Department of Energy Order 225.1B, *Accident Investigations*, dated March 4, 2011.

I accept the findings of the Board and authorize the release of this report for general distribution.

JUSTON
FONTAINE

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Juston K. Fontaine
Deputy Director for Operations
Office of Science
U.S. Department of Energy

EXECUTIVE SUMMARY

On the morning of July 1, 2026, a pedestrian at Brookhaven National Laboratory (BNL) was walking east from an on-campus dormitory to an office building. At the same time, a Forklift Operator was driving a forklift north on Upton Road after refueling at the diesel station adjacent to Building 423. At approximately 9:30 a.m., the forklift struck the Pedestrian in the crosswalk. The Pedestrian was trapped under the forklift and dragged for at least 29 feet, and sustained serious lower body injuries. Witnesses and bystanders contacted emergency services and provided comfort to the Pedestrian until Brookhaven Fire Rescue arrived on scene. The Pedestrian was transported via medivac to Stony Brook University Hospital, a Level 1 Trauma Center. The Pedestrian was discharged from the hospital on July 29, 2026.

On July 4, 2026, in accordance with U.S. Department of Energy (DOE) Order 225.1B, the DOE Office of Science Deputy Director for Operations appointed a DOE Accident Investigation Board (AIB or Board) chairperson to assemble a team to investigate the event. The purpose of the investigation is not to assign blame, but to determine the facts and circumstances related to the event and identify possible weaknesses and opportunities for improvement related to implementation of Integrated Safety Management principles.

After thorough interviewing, evidence gathering, and analysis, the AIB concluded that this was not simply a traffic accident that could have happened on any street. Although this accident involves a forklift operator and a pedestrian, the individual's actions must be viewed within the context of BNL's processes and culture and BNL is ultimately responsible for keeping its employees and guests safe. The presence of an industrial forklift on Upton Road represented an error-likely situation in which safe performance depended heavily on individual vigilance rather than layered and reliable organizational defenses. Specifically, this accident could have been prevented if BNL had better assessed and understood the hazards of operating industrial forklifts on laboratory roadways alongside cars and pedestrians. In addition, systemic weaknesses allowed for less-than-safe practices to occur on site, including:

- On the day of the accident, the Forklift Operator was not authorized to operate a forklift because they were overdue in completing a required hands-on skills assessment known as a "practical qualification." BNL failed to prevent the Forklift Operator from working with an expired qualification.
- BNL provided incomplete training that did not prepare the Forklift Operator for safe on-road driving.
- BNL considered the Forklift Operator's refueling trip to be worker-planned work (or skill of the craft) and did not identify or analyze the hazards for an unloaded forklift to drive across the site, despite an operator's significantly obstructed view.
- The forklift did not have additional installed safety features that could have alerted the Forklift Operator or Pedestrian prior to collision.
- The crosswalk configuration and signage were ineffective to alert the Forklift Operator to the Pedestrian's presence.
- A BNL culture of normalizing noncompliance with site procedures contributed to several of the less-than-safe practices described above.

These resulted in the Direct Cause of this accident – the forklift struck the Pedestrian in the crosswalk. The Board identified two local root causes and three systemic root causes that, if corrected by BNL, would prevent the recurrence of the same or similar accidents:

- When entering the crosswalk, the Pedestrian believed the forklift would stop and did not adequately perceive the risk that the Forklift Operator would not see them or would be unable to stop in time. (Local Root Cause 1)
- The Forklift Operator failed to see the Pedestrian and failed to stop at the crosswalk. (Local Root Cause 2)
- BNL allowed the common practice of driving to refuel instead of calling for a fuel truck, which resulted in the forklift being on the roadway. (Systemic Root Cause 1)
- BNL did not conduct a documented hazard analysis for on-road forklift operations, resulting in failure to identify and implement measures to prevent forklifts striking pedestrians. (Systemic Root Cause 2)
- BNL permitted forklifts to drive unescorted on roadways when unloaded, resulting in an operator driving a forklift with obscured vision. (Systemic Root Cause 3)

This report provides detailed analysis that supports the identification of Causes, Conclusions, and Judgments of Need to prevent the recurrence of similar accidents. While this report is specific to the accident that occurred on July 1, 2026, at BNL, the Board notes that there are broad lessons that can be applied across the DOE complex of labs, plants, and sites where industrial vehicles commonly access roads where pedestrians, bicyclists, and other vehicles are present.

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ACRONYMS AND ABBREVIATIONS

AIB	Accident Investigation Board (or Board)
ANSI	American National Standards Institute
BHSD	Brookhaven Site Office
BNL	Brookhaven National Laboratory
Board	Accident Investigation Board (or AIB)
BSA	Brookhaven Science Associates
BTMS	Brookhaven Training Management System
CAIRS	Computerized Accident Incident Reporting System
CAS	Contractor Assurance System
CC	Contributing Cause
CFR	<i>Code of Federal Regulations</i>
CON	Conclusion
DC	Direct Cause
DOE	U.S. Department of Energy
EIC	Electron Ion Collider
ES&H	Environment, Safety, and Health Directorate
FBI	Federal Bureau of Investigation
FY	Fiscal Year
ISM	Integrated Safety Management
ISMS	Integrated Safety Management System
ITSDf	Industrial Truck Standards Development Foundation
JON	Judgment of Need
JPM	job performance measure
LRC	Local Root Cause
MOU	memorandum of understanding
MPH	mile(s) per hour
NIOSH	National Institute for Occupational Safety and Health
NSLS-II	National Synchrotron Light Source II
NTS	Noncompliance Tracking System
OFI	opportunity for improvement
OPEX	Operating Experience
ORAU	Oak Ridge Associated Universities

ORISE	Oak Ridge Institute for Science and Education
ORPS	Occurrence Reporting and Processing System
OSHA	Occupational Safety and Health Administration
SBMS	Standards-Based Management System
SC	DOE Office of Science
SCPD	Suffolk County Police Department
SPI	serious personal injury
SRC	Systemic Root Cause

1 INTRODUCTION

1.1 BACKGROUND

On the morning of July 1, 2026, a 15,560-pound forklift hit a Pedestrian in a crosswalk at the intersection of Mitchell Lane and Upton Road. The Pedestrian was walking east from Curie House, a residential dormitory, to a work site in Building 490. The forklift was traveling north on Upton Road after refueling at the diesel station adjacent to Building 423 (Motor Pool). The Pedestrian identified the approaching forklift, presumed it would stop for them, then continued to walk eastbound into the crosswalk. The forklift proceeded from the south, traveling approximately 10 miles per hour (MPH) as it closed in on the crosswalk. The Forklift Operator did not identify the Pedestrian in the crosswalk. The Pedestrian was two-thirds to three-quarters of the way across the crosswalk, still walking east, when the front-left side of the forklift's carriage struck the Pedestrian's right side. The forklift was still traveling approximately 10 MPH at this time. The Pedestrian was knocked down, and their left side was trapped. The Pedestrian was dragged for at least 29 feet before the forklift came to a complete stop. The Pedestrian's lower body sustained serious injuries, which necessitated the Brookhaven National Laboratory (BNL) Fire Rescue Group arranging for a medivac to Stony Brook University Hospital, a Level 1 Trauma Center. The Pedestrian was hospitalized for 28 days.

On July 4, 2026, the Deputy Director for Operations for the U.S. Department of Energy's (DOE) Office of Science (SC) appointed a DOE Accident Investigation Board (AIB or Board) to investigate the event to determine the facts and circumstances and any contributing factors. The criteria in DOE Order (O) 225.1B, *Accident Investigations*, had not been met when the Board was originally appointed; however, given the seriousness of the injuries it was anticipated the event would meet the criteria. On July 6, 2026, the criteria in DOE O 225.1B, Appendix A, Item 2.a (2) had been met:

“any single accident that results in the hospitalization for more than five calendar days, commencing within seven calendar days of the accident, of one or more DOE, contractor, or subcontractor employee or members of the public due to a serious personal injury or acute chemical or biological exposure.”

Accordingly, an amended charge was issued. The July 4 and 6, 2026, appointment memoranda are included in Appendix A in this report.

1.2 SITE DESCRIPTION

BNL is a multi-program laboratory located in Upton, New York, within Suffolk County. The lab includes 318 buildings on a 5,322-acre site. BNL has approximately 3,000 employees and an annual total of approximately 7,200 facility users and visiting scientists. The annual lab budget is approximately \$888 million. BNL has 29 miles of paved roads and 49 miles of unpaved roads. BNL roads are private roads, as defined by the State of New York. BNL is responsible for access and maintenance of the roads and signage.

BNL's research is organized in four focus areas: understanding the basic building blocks of matter—enabled by the future Electron Ion Collider (EIC); leading in discovery with light-enabled science at the National Synchrotron Light Source II (NSLS-II); pursuing an interdisciplinary approach to next-generation information science and capabilities; and advancing energy security and essential resource independence.

Brookhaven Science Associates (BSA) manages BNL on behalf of DOE under the government-owned, contractor-operated governance model. BSA is a partnership between Battelle Memorial Institute and Research Foundation for State University of New York.

BNL manages many of its institutional programs and requirements through its Standards-Based Management System (SBMS). SBMS establishes laboratory-wide subject areas that define requirements, roles, responsibilities, and implementing processes for specific programs. Individual BNL organizations are responsible for implementing the applicable requirements within their work activities. Programs relevant to this accident are managed through SBMS subject areas including Forklift Safety, Traffic Safety, and Work Planning and Control.

The U.S. Atomic Energy Commission established BNL in 1947 at the former site of the U.S. Army's Camp Upton. The U.S. government purchased the property from the State of New York in 1933 under a Deed of Cession of Jurisdiction that was signed by the governor of New York and authorized by law enacted by the state legislature. Because the federal government purchased the land by the consent of the legislature of the State, the laboratory is a federal enclave.

Under the federal enclave doctrine, a state has no right to legislate with respect to activities occurring in the enclave unless it reserved its right to do so when it consented to the purchase of the property by the United States. State laws that are in effect when jurisdiction is transferred to the United States remain in force. Violations of state criminal laws are enforced in federal courts.

Notably, of the 10 National Laboratories stewarded by DOE's SC, BNL is the only one that is a federal enclave. The other nine National Laboratories are located on federally owned or leased land, but the relevant state governments did not pass laws granting jurisdiction to the federal government.

1.3 ORGANIZATIONAL RELATIONSHIPS

This section provides information on organizations that are involved with the work performed at BNL, as well as other organizations that are relevant to the accident.

1.3.1 U.S. Department of Energy

DOE's mission is to ensure America's security and prosperity by addressing its energy, environmental, and nuclear challenges through transformative science and technology solutions.

BNL is one of DOE's 17 National Laboratories, which have served as the leading institutions for scientific innovation in the United States for more than 70 years. The National Laboratories tackle the critical scientific challenges of our time and possess unique instruments and facilities, many of which are found nowhere else in the world. They address large-scale, complex research and development challenges with a multidisciplinary approach that emphasizes translating basic science into innovation.

1.3.2 DOE Office of Science

SC has a mission to deliver scientific discoveries and major scientific tools to transform the understanding of nature and advance the energy, economic, and national security of the United States. SC is the nation's largest federal sponsor of basic research in the physical sciences and is a major supporter of research in key scientific fields such as physics, materials science, computing, and chemistry. SC is also the lead federal agency supporting fundamental scientific research related to energy.

SC stewards BNL and provides more than 95% of the laboratory's funding.

1.3.3 Brookhaven Site Office

The Brookhaven Site Office (BHSO) is an organization within SC that provides dedicated, on-site federal stewardship of BNL, including program implementation and acquisition management. BHSO plays an important role in the safe and efficient operation of BNL while enabling the pursuit of research and development in support of DOE's missions. BHSO has a direct role in overseeing laboratory safety, including evaluating safety performance as part of the lab appraisal process, overseeing the lab's Contractor Assurance System (CAS), and partnering with the lab to ensure implementation of DOE rules and regulations.

1.3.4 Brookhaven National Laboratory

The core structure of BNL is divided into two main branches: Science and Operations. The Science Branch consists of six directorates: Computing and Data Sciences; Energy and Photon Sciences; Discovery Technologies; Environment, Biology, Nuclear Science and Nonproliferation; Electron Ion Collider; and Nuclear and Particle Physics. The Operations Branch comprises four science support directorates: Business Services; Facilities and Operations; Environment, Safety, and Health (ES&H); and Human Resources.

The Forklift Operator is an employee of the Facilities and Operations directorate matrixed to the Collider-Accelerator Department, which is part of the Nuclear and Particle Physics directorate.

1.3.5 Federal Bureau of Investigation

The mission of the Federal Bureau of Investigation (FBI) is to protect the American people and uphold the Constitution of the United States. The FBI works around the globe, including at its headquarters in Washington, D.C.; 56 field offices; about 50 satellite offices; and more than 60 international offices.

The FBI has the primary responsibility for conducting law enforcement investigations at BNL due to the lab's status as a federal enclave.

1.3.6 Suffolk County Police Department

The Suffolk County Police Department (SCPD) is a law enforcement agency with approximately 2,500 sworn police officers and 600 civilian employees. SCPD Headquarters, SCPD Sixth Precinct station house, and SCPD Seventh Precinct station house are located near BNL.

Because of BNL's status as a federal enclave, SCPD does not have jurisdiction over incidents that occur at BNL. SCPD provides assistance to BNL under a July 2004 Memorandum of Understanding (MOU), which the two sides updated in January 2025. Under the MOU, SCPD provides personnel and equipment to augment BNL security and emergency response capabilities in designated scenarios (e.g., security response, traffic control, intoxication determination via breathalyzer, and helicopter), and BSA provides support to SCPD through use of the site for SCPD training, forensic analysis, and support to SCPD's hazardous materials program.

1.3.7 Oak Ridge Institute for Science and Education

The Oak Ridge Institute for Science and Education (ORISE) is a DOE asset that is dedicated to enabling critical scientific, research, and health initiatives of the DOE and its laboratory system. ORISE is managed by Oak Ridge Associated Universities (ORAU), a university consortium of more than 170 major Ph.D.-granting academic institutions and a 501(c)(3) nonprofit corporation. ORAU strengthens the nation's workforce by developing scientific and technical workers, connecting talent and expertise, and improving the health, safety,

and resilience of the communities where they live and work to achieve scientific discovery and economic growth.

The Pedestrian injured in the accident was participating in an internship program administered by ORISE and was performing activities at BNL as part of the internship. BNL therefore categorized the Pedestrian as a guest at the lab. The Pedestrian received a stipend as a student intern, but was not an employee of ORISE, DOE, or BNL.

1.4 SCOPE, CONDUCT, AND METHODOLOGY

1.4.1 Investigation Timeline

The SC Deputy Director for Operations formally appointed an AIB chairperson on July 4, 2026. Later, on July 6, 2026, the Deputy Director issued an amended charge, naming six additional members to the AIB (see Appendix A).

The AIB initiated its investigation with on-site interviews and field activities at BNL on July 7–10 and 13–17. The AIB received an initial briefing from BNL leadership, conducted 38 interviews, reviewed over 500 documents, and visited the following locations:

- Accident scene,
- Maintenance garage where the forklift involved in the accident was stored following the accident,
- Locations where forklift drivers conduct practical assessments, and
- Locations where Collider-Accelerator Department forklifts are stored.

From July 20 through August 19, the AIB conducted additional document reviews, interviews, and analyses, and developed this report. The team conducted daily progress meetings, and the AIB Chair periodically updated the SC Deputy Director for Operations. The AIB Chair provided a summary of the preliminary findings to the SC Deputy Director for Operations on August 20, 2026.

1.4.2 Investigation Process

The Board arrived at BNL on July 7, 2026, six days after the accident occurred. Documents and oral interviews provided the Board valuable information pertaining to management systems and practices that were in place at the time of the accident. Interviews with personnel also provided detailed descriptions of the activities that occurred on the day of the accident and during the emergency response.

The Board examined evidence directly related to the accident, including photographs of the accident scene, available video evidence, witness statements taken by the BNL Security Police, and the forklift, which had been cleaned, removed from the scene, and stored in a safe configuration.

The AIB observed the post-accident forklift operational review, which included running the forklift and testing braking capability.

In coordination with the AIB, BNL conducted accident re-creation activities, including a controlled test of forklift stopping abilities and a video-recorded test of visibility from the vantage point of a forklift operator on Upton Road at points along the route up to the crosswalk at Mitchell Lane.

The AIB investigated this accident using DOE O 225.1B and the methodology prescribed in DOE Handbook 1208-2012, *Accident and Operational Safety Analysis*. In accordance with these methods, the AIB:

- Gathered facts relevant to the accident through interviews, documents, evidence reviews, and examination of physical evidence to develop the chronology.
- Used barrier analysis, change analysis, and event and causal factor techniques to analyze the facts, identify the cause(s) of the accident, and draw Conclusions.
- Based upon the Conclusions, identified Judgments of Need to prevent recurrence.

All statements of fact in this report are based on evidence collected by the AIB, including interviews, video recordings, and documentation. Appendix C lists the primary pieces of evidence that serve as the basis for the report.

The definition and description of barrier analysis, change analysis, causal factors, and Judgments of Need are as follows:

- **Barrier Analysis**—Review of the hazards, the targets (people or objects) of the hazards, and the controls or barriers that management systems put in place to separate the hazards from the targets:
 - **Hazard:** The potential for unwanted energy flow that results in an adverse consequence.
 - **Target:** A person or object that a hazard may damage, injure, or fatally harm.
 - **Barrier:** Any means used to control, prevent, or impede the hazard from reaching the target, thereby reducing the severity of the resultant accident or adverse consequence. Barriers may be physical or administrative.

For an accident to occur, the target must be exposed to the hazard. Barriers are part of a system or work process designed to protect personnel and equipment from hazards. Thus, when an accident occurs, a Hazard comes in contact with a target because barriers did not exist, were not used, or were not effective in mitigating the hazard.

- **Change Analysis**—Systematic approach that examines planned or unplanned changes in a system that caused the undesirable results related to the accident. Change is anything that disturbs the balance of a system operating as planned. Change can be planned, anticipated, and desired, or it can be unintentional and unwanted. The change analysis process compares the difference between what is normal or ideal (work as imagined) and what occurred (work as done).
- **Causal Factor**—An event or condition in the accident sequence necessary and sufficient to produce or contribute to the unwanted result. There are four types of causal factors:
 - **Direct Cause:** An immediate event or condition that caused the accident.
 - **Local Root Cause:** A primary, task-level deficiency or failure within a specific operational unit, component, or immediate process that, when corrected, directly prevents the recurrence of the incident.
 - **Systemic Root Cause:** A foundational deficiency in an organization's policies, programs, management systems, or oversight structures that, when corrected, prevents the recurrence of similar, related, or widespread failure modes across the entire organization.
 - **Contributing Cause:** Event or condition that, collectively with other causes, increases the likelihood of an accident but that individually does not cause the accident. A Contributing Cause may be a longstanding condition or a series of prior events that, alone, were not

sufficient to cause the accident but were necessary for it to occur. A Contributing Cause is an event or condition that set the stage for the accident and, if allowed to persist or reoccur, increases the probability of future accidents.

- **Judgments of Need**—Managerial controls and safety measures necessary to prevent or minimize the probability or severity of a recurrence of an accident.

2 THE ACCIDENT

2.1 SUMMARY

Table 1 summarizes the events and actions associated with the accident described in this section. It is designed to assist with the context around events on the day of the accident, July 1, 2026. A detailed description of the timeline is provided in the Events and Causal Factors chart in Appendix G.

Table 1: Summary of Key Events from July 1, 2026

Time (Blank Indicates Time is Unknown)	Event
Approx. 9:15 a.m.	Forklift Operator refueled forklift and began driving toward Building 911.
	Forklift Operator turned left onto Upton Road and drove northbound.
9:28 a.m.	Pedestrian left dormitory, walking eastward on Mitchell Lane toward crosswalk that crosses Upton Road.
9:28:04–9:28:45 a.m.	Three cars (Drivers 1, 2, and 3) crossed double yellow lines to pass Forklift Operator while driving northbound on Upton Road.
	Forklift Operator noticed vehicle approaching from behind (Driver 4). Forklift Operator moved to the right, near the sidewalk, to allow vehicle to pass.
	Driver 4 prepared to pass forklift but saw Pedestrian and did not pass.
	Pedestrian stepped into crosswalk, moving eastward across Upton Road.
Approx. 9:30 a.m.	Forklift struck Pedestrian.
	Forklift trapped and pushed the Pedestrian at least 29 feet on road before forklift came to a stop.
	Driver who was two cars behind the forklift at the time of the accident (Driver 5) contacted BNL Police Department by driving to the nearby police station and using the lobby phone.
9:31:05 a.m.	Bystander 1 called 9-1-1.
9:31:53 a.m.	After receiving the 9-1-1 call from Bystander 1, Suffolk County sent an emergency dispatch to BNL Fire Rescue to respond to the scene.
9:33 a.m.	First BNL Fire Rescue responder arrived at accident scene and provided medical services to Pedestrian.
10:11 a.m.	SCPD helicopter evacuated Pedestrian from accident site for transport to hospital.
11:06 a.m.	BNL Police Department turned over accident scene to BNL ES&H Directorate to perform accident investigation.
1:30 p.m.	BNL ES&H Directorate released the accident scene.
1:35 p.m.	BNL ES&H Directorate reopened Upton Road.

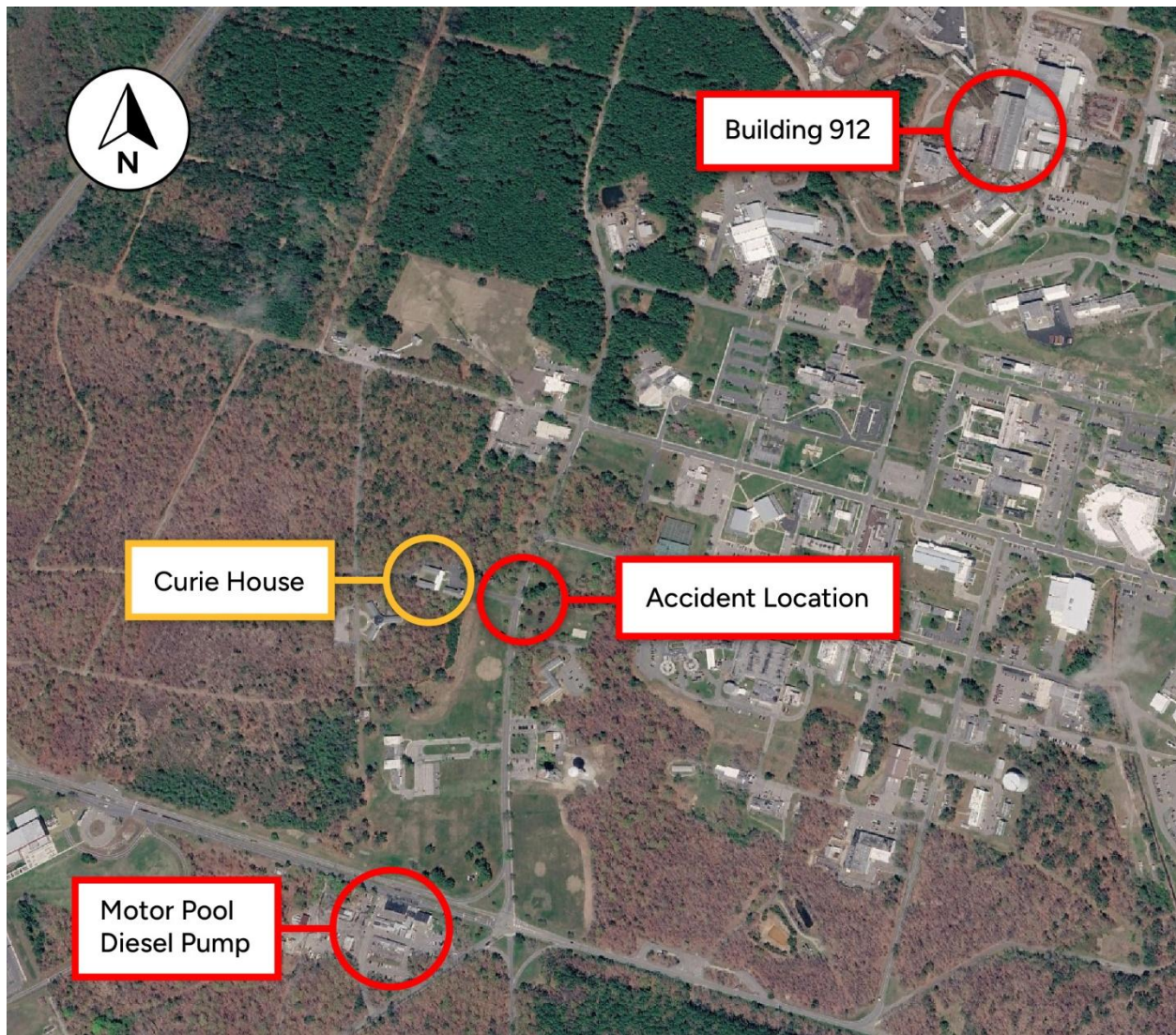


Figure 1: Satellite image of BNL with notable locations associated with the accident. See Appendix D for a more detailed map.

2.2 DETAILED SEQUENCE OF EVENTS

2.2.1 *Plan of the Day Meeting*

At approximately 8:00 a.m., the BNL Collider-Accelerator Department Rigging Group held a plan of the day meeting in Building 912. At this meeting, team leads gave the Rigging Group instructions on the work activity to be accomplished before the 10:00 a.m. break. The Forklift Operator was assigned to work clearing debris dumpsters in the Building 912 area. The work control document for debris clearing was issued in November 2025, and this group of forklift operators performed the task regularly during the previous 7 months as the facility was being decommissioned and dismantled. The Forklift Operator used the forklift with asset number 00131574. The data plate for this forklift is shown in Figure 3.



Figure 2: Forklift parked after the accident; the AIB digitally removed the Pedestrian's personal items from this image and the similar image on the report's cover.

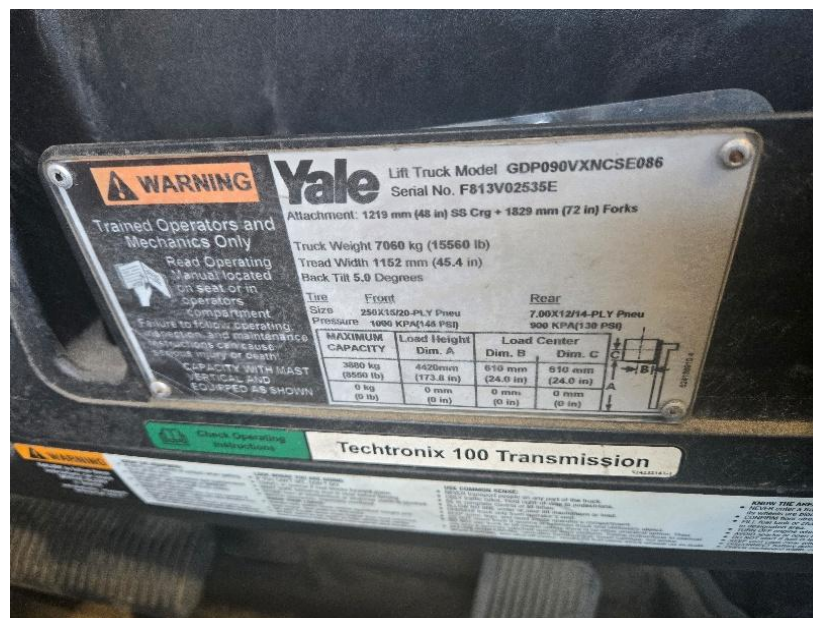


Figure 3: Forklift data plate.

2.2.2 Forklift Operator Works in Building 919 Area

Using the forklift, the Forklift Operator drove to the Building 912 area, picked up a dumpster, brought it to the Building 919 area, emptied it, and returned it to the starting location. After completing these tasks, the Forklift Operator noticed that the forklift's fuel gauge was on the last bar and blinking to indicate low fuel. The Forklift Operator requested approval from the team lead to refuel the forklift, and the team lead approved the request.

2.2.3 Forklift Operator Refuels Forklift at Motor Pool

The Forklift Operator drove the forklift to the diesel refueling station adjacent to Building 423, on Princeton Avenue, and refueled at the laboratory's only on-site diesel pump. The AIB assessed that this activity concluded around 9:15 a.m.

2.2.4 Forklift Operator Drives North to Return to Worksite

After refueling, the Forklift Operator turned right to exit the yard and then turned left at the intersection of Princeton Avenue and Upton Road. Both Princeton Avenue and Upton Road are main thoroughfares used for a large portion of vehicle traffic at BNL.

The Forklift Operator drove northbound on Upton Road, a two-lane road with a double yellow line separating the north and southbound lanes, at a speed of approximately 10 MPH with the forks approximately 8–10 inches off the ground, a standard driving configuration for forklifts with no payload (see Figure 4 for depiction of Forklift Operator's view). The vehicle speed limit for the road is 30 MPH; however, the maximum speed of this forklift is about 10–11 MPH.



Figure 4: First-person view from the forklift involved in the accident approaching the crosswalk where the accident took place. (The image is a screen capture from first-person video recorded during the accident re-creation on July 14, 2026.)

The forklift passed the BNL Police Headquarters (Building 50), which is approximately 1,000 feet from the crosswalk at Upton Road and Mitchell Lane, at 9:28 a.m. (Figure 5). At least three vehicles (operated by Driver 1, Driver 2, and Driver 3) passed the forklift between the BNL police station and the crosswalk by crossing the double yellow lines on Upton Road. Two additional vehicles (operated by Driver 4 and Driver 5) were following behind the forklift.



Figure 5: Forklift passed the BNL police station at 9:28 a.m. (BNL Police Headquarters camera; red circle added to photo to highlight forklift.)

2.2.5 Pedestrian Walks from Dormitory toward Work Site

The Pedestrian exited Curie House, their on-site dormitory. At 9:28 a.m., the Pedestrian was walking eastbound quickly toward the crosswalk at Upton Road and Mitchell Lane. The Pedestrian's scheduled start time was 9:00 a.m.

The Pedestrian was attempting to make a cell phone call, with one earbud in, while approaching the crosswalk. The Pedestrian looked left and right before crossing, saw the forklift and two vehicles at a distance that the Pedestrian judged to be safe, and entered the crosswalk.

There is no stop sign at the crosswalk for traffic on Upton Road. However, continuous caution lights identify the crosswalk (as shown in Figure 6).

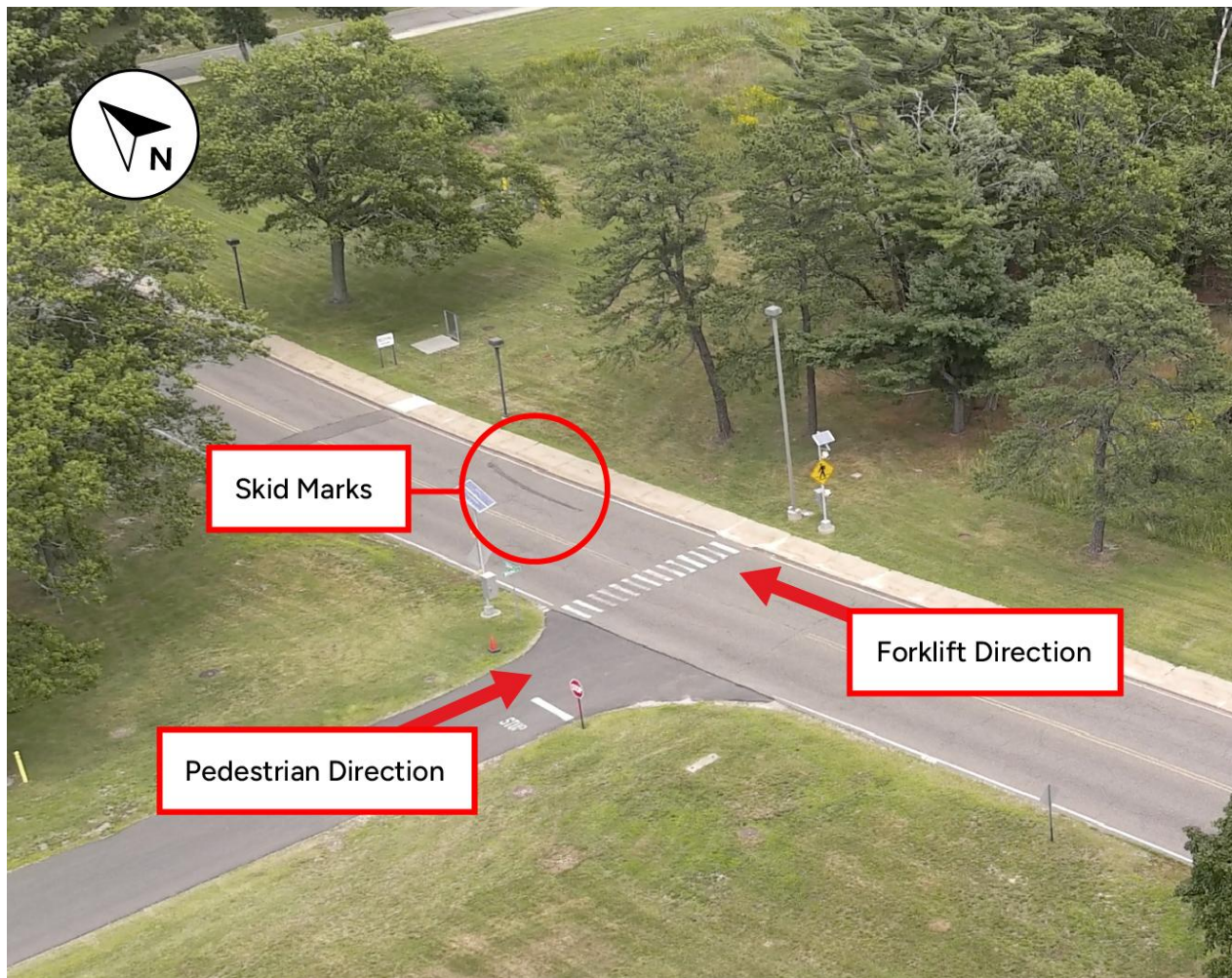


Figure 6: Overhead view of crosswalk and signage at Mitchell Lane and Upton Road intersection; skid marks are circled. (BNL drone footage from accident re-creation on July 14, 2026. To reflect the scene the day of the accident, the image was digitally altered by removing police vehicles and additional crosswalk signage BNL placed after the accident.)

2.2.6 Forklift Strikes Pedestrian in Crosswalk

The forklift struck the Pedestrian in the crosswalk after the Pedestrian had walked more than halfway across the crosswalk. At the time of impact, the Pedestrian had crossed the double yellow lines and entered the northbound lane of traffic (approximately 6.8 feet away from the edge of the east curb). After impact, the Pedestrian's left side hit the ground.

The Forklift Operator did not immediately recognize that the forklift hit the Pedestrian and did not start braking until seeing the Pedestrian on the ground. As the Forklift Operator braked, the truck's left front tire left a visible 29-foot-long skid mark before coming to a complete stop 54 feet past the crosswalk. The skid mark began 25.4 feet past the crosswalk. The one visible skid mark was from the left front tire. See Figure 7 for a detailed diagram of the accident.

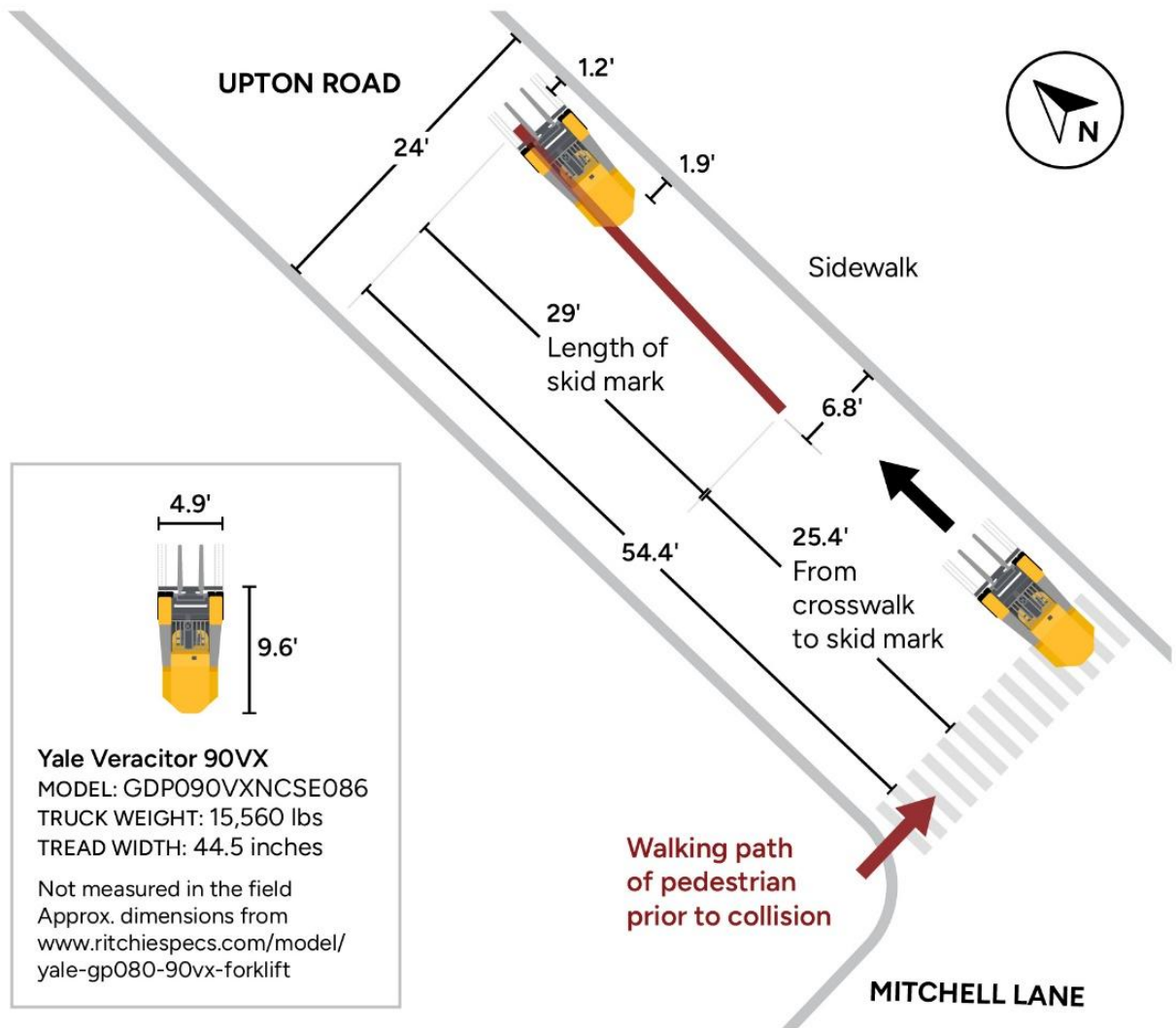


Figure 7: Diagram of forklift braking after impact, from BNL ES&H measurements.

The Pedestrian was trapped and pushed along the ground in front of the forklift tires. The Board cannot determine whether the Pedestrian was initially struck, thrown forward in the roadway, and then pushed against the road for 29 feet, or if the Pedestrian was under the forklift for all 54 feet from the crosswalk to the end of the skid mark. The Board concludes that the Pedestrian was trapped between the forklift carriage, forks, and the asphalt road and pushed along the road for at least 29 feet but no more than 54 feet. After the vehicle stopped, the Forklift Operator raised the forks and backed up the forklift (as shown in Figure 8).



Figure 8: Photo of forklift and skid mark on July 1, 2026 (courtesy of BNL).

2.2.7 Bystander Assistance and Calls to Emergency Services

After backing up the forklift, the Forklift Operator immediately called their supervisor to report the accident. Two minutes later, the Forklift Operator called BNL emergency services, but the call was forwarded to BNL's non-emergency line and placed on hold because the emergency line was in use (because BNL personnel were on the line with Suffolk County Fire, Rescue and Emergency Services). The Forklift Operator hung up before speaking with an operator.

At the time of the accident, Driver 4 was driving north on Upton Road directly behind the forklift. Driver 4 parked on the sidewalk, exited the vehicle, and yelled to Driver 5 (directly behind) to call the police. Driver 4 attempted to render first aid to the Pedestrian.

Driver 5 performed a U-turn and drove to the nearby BNL police station (approximately 1,000 feet). Driver 5 parked, entered the police station, and used the lobby phone to notify emergency services of the accident.

After the accident, Bystanders 1 and 2 were driving in the same vehicle in the southbound lane on Upton Road toward the crosswalk. With the windows in their vehicle down, they heard the Pedestrian screaming from approximately 325 feet away. Bystander 1 instructed Bystander 2 to call their supervisor, then Bystander 1 ran to the scene. After arriving at the scene, Bystander 1 called 9-1-1 at 9:31:05 a.m.

At the same time, Bystander 3 was leaving Building 400, which is less than a half mile from the accident site. Bystander 3 heard the Pedestrian screaming and drove a lab-owned Kubota utility vehicle to the accident site. Upon arriving at the scene, Bystander 3 comforted the Pedestrian, saw Bystander 1 on the phone, and confirmed that Bystander 1 had called emergency personnel.

2.2.8 Medical Emergency Response

Suffolk County Fire, Rescue and Emergency Services answered Bystander 1's 9-1-1 call, sent a text message to BNL emergency responders at 9:31:53 a.m., and sent an alert to BNL emergency responders' radios.

The first responder from BNL Fire Rescue arrived within less than 1 minute of receiving the alert from Suffolk County. Additional BNL Fire Rescue personnel arrived less than 1 minute after that. Within 3 minutes of first responders arriving on scene, BNL Fire Rescue issued a request to Suffolk County emergency services for a helicopter to transport the Pedestrian to the hospital.

BNL Fire Rescue stabilized the Pedestrian's left leg, which had the most visible severe injuries, and protected the Pedestrian's spine and neck. When additional BNL Fire Rescue personnel arrived on scene, they inserted an intravenous line, bandaged and splinted the Pedestrian's lower extremities, applied a protective collar, put the Pedestrian on a backboard, and administered pain medication.

At 9:55 a.m., BNL Fire Rescue loaded the Pedestrian into an ambulance for transport to the helicopter. At 10:00 a.m., the Suffolk County helicopter landed in a grassy area near the accident site, south of BNL Police Headquarters. BNL Fire Rescue briefed the flight paramedic on the Pedestrian's injuries and worked with the flight paramedic to secure the patient for helicopter transport, administer another dose of pain medication, and load Pedestrian into the Suffolk County helicopter.

The helicopter took off at 10:11 a.m. and reached Stony Brook University Hospital within approximately 10 minutes.

2.2.9 Police Response

BNL Police arrived at the accident scene and established traffic control. Subsequently, BNL Police separated and monitored the Forklift Operator, Bystanders 1 and 2, and Driver 4; took photos of the accident scene; issued notifications to the SCPD and the FBI; and collected the Pedestrian's belongings for safekeeping (including cell phone, wallet, laptop, and other personal effects).

SCPD arrived at the BNL main gate at 9:46 a.m. and assisted with scene management and setting up a helicopter landing zone.

BNL Police called the FBI Supervisory Special Agent and described the situation. The FBI deferred the response to SCPD because it appeared to be an emergency response matter and not criminal. BNL Police

advised Suffolk County Police that BNL may need support from the county's crime scene and accident investigation teams.

Shortly after the helicopter took off at 10:11 a.m., BNL Police moved the Forklift Operator, Bystanders 1 and 2, and Driver 4 to BNL Police Headquarters.

Per the Pedestrian's request on July 1, BNL Police provided the Pedestrian's cell phone to a Suffolk County Police Officer to be brought to the hospital. BNL Police inventoried and stored the remainder of the Pedestrian's belongings at BNL Police Headquarters and then returned the belongings to the Pedestrian on July 2.

On July 1, Suffolk County Police went to Stony Brook University Hospital to determine whether the Pedestrian's injuries constituted a serious personal injury (SPI). Under New York State law, an SPI is defined as a personal injury that results in death; dismemberment; significant disfigurement; a fracture; loss of a fetus; permanent loss of use of a body organ, member, function or system; permanent consequential limitation of use of a body organ or member; or significant limitation of use of a body function or system. Following their visit to the hospital, SCPD informed BNL Police that SCPD would not deploy the crime scene or accident investigation teams because they had determined the injury did not constitute an SPI.

2.2.10 Actions Following SCPD Decision Not to Deploy Investigation Teams

BNL Police notified the FBI of the SCPD decision not to investigate and turned the scene over to BNL's ES&H Directorate to conduct a safety event investigation in conjunction with BNL's Laboratory Protection Division.

BNL ES&H took photos and measurements at the scene. BNL Police Department took written statements from the Forklift Operator, Bystanders 1 and 2, and Driver 4. BNL Occupational Medicine administered a breathalyzer alcohol test and urine drug test on the Forklift Operator. The results of both tests were negative, showing no alcohol or drugs in the person's system.

BNL Fire Rescue cleaned the accident scene. The BNL Heavy Equipment Maintenance and Operation team moved the forklift to the motor pool for storage. ES&H released the accident scene at 1:30 p.m. and reopened the roadway at 1:35 p.m.

3 EXAMINATION AND ANALYSIS OF THE EVIDENCE

This section focuses on the Board's examination of the facts and events and provides analysis of the conditions and causal factors that resulted in the July 1 accident. Conclusions that the AIB believes would prevent recurrence are listed in each subsection.

The AIB organized the assessment of this accident into five categories:

- Organization, Culture, and People
- Forklift Program and Features
- Traffic Safety
- Training
- Response

3.1 ORGANIZATION, CULTURE, AND PEOPLE

The AIB evaluated the organizational systems, safety culture, and human behaviors that established the conditions for the July 1 accident. Rather than an isolated incident of individual error, this collision occurred within an operational environment characterized by the normalization of procedural deviations. The presence of an industrial forklift on Upton Road represented an error-likely situation in which safe performance depended heavily on the human performance of the Pedestrian and Forklift Operator, rather than layered and reliable organizational defenses. Specifically, this accident could have been prevented if BNL better assessed and understood the hazards of operating industrial forklifts on laboratory roadways alongside cars and pedestrians.

Prior to this accident on July 1, 2026, DOE experienced two previous incidents when a forklift struck a pedestrian and caused injuries severe enough to trigger an AIB. The first occurred on May 9, 1991, at the Idaho Chemical Processing Plant, and the second occurred on July 12, 2007, at the Paducah Gaseous Diffusion Plant. The 1991 incident resulted in a fatality. The AIB reports on these two incidents identified similar root causes (covered in more detail in Section 7, Additional Points of Interest).

However, these **previous DOE forklift events did not provide sufficient corrective actions to prevent recurrence (Contributing Cause 1)**. These incidents and fatality highlight the dangers of forklifts and pedestrians intermixing and make it clear appropriate authorizations, management systems, and controls must be in place to protect pedestrians from forklifts and similar industrial and construction vehicles.

3.1.1 Normalization of Noncompliance and Supervisory Oversight

During the investigation, the AIB identified repeated instances of noncompliance with site procedures at BNL. When viewed individually, these items do not appear to contribute to the accident itself. However, when taken collectively, the Board notes that the normalization of noncompliance in several key areas specifically ties to this accident. The Board's review of site procedures was limited to training, forklift operations, and traffic safety, and instances of noncompliance were found in each area:

- **Qualification Enforcement Failure:** The Forklift Operator's qualification lapsed on June 12, 2026. Automated notifications from the Brookhaven Training Management System (BTMS) remained at the operator and supervisor level. There was no defined escalation path to division or ES&H

management, which allowed the Forklift Operator to remain uncertified. (For more details, see Section 3.4, Training.)

- **Historical Training Gaps:** A review of the Forklift Operator’s training records revealed multiple instances of missed training deadlines between 2004 and 2024. A long-term pattern of this employee not completing required training on time was evident based on their historical training profile. (For more details, see Section 3.4, Training.)
- **Pre-Use Inspections:** On the day of the accident, the Forklift Operator failed to document the required daily pre-use inspection of the forklift. The local paper-tag logging system lacked independent verification or supervisory checks. This allowed the daily inspection tag to remain without updates since April 18, 2026, as shown in Figure 9. Further, this procedural noncompliance occurred without supervisory or management intervention. The AIB assesses that the forklift was in good working order at the time of the accident. Therefore, the failure to complete or document the inspection did not directly impact the accident, but it does demonstrate an important instance of noncompliance with BNL requirements; it also calls into question BNL’s compliance with the Occupational Safety and Health Administration (OSHA) requirement to examine industrial trucks at least daily before placing them in service (1910.178(q)(7)).
- **Passing Slow-Moving Vehicles in No-Passing Zones:** On-site drivers routinely passed slow-moving industrial equipment, often crossing double yellow lines. This practice was culturally normalized. On the morning of the accident, multiple vehicles crossed the double yellow lines to pass the forklift.



Figure 9: Forklift pre-use inspection tag after the accident on July 1, 2026.

Based on these facts, the AIB assesses that **BNL's culture of normalizing noncompliance with site procedures contributed to the failure to prevent an operator with an expired practical qualification from driving the forklift (Contributing Cause 2).**

3.1.2 Pedestrian's Actions

The AIB identified human performance factors, including pedestrian distraction and inadequate risk perception, as elements of this event. The Pedestrian was distracted by cell phone use and was unfamiliar with forklift operating characteristics. This resulted in the Pedestrian entering the crosswalk without verifying that the approaching forklift could or would stop. The Board notes that while individual actions contributed to the event, BNL is ultimately responsible for identifying and implementing policies and procedures to keep employees and guests safe. The human performance elements are as follows:

- **Pedestrian Distraction:** The Pedestrian was late for work and walked quickly to and through the crosswalk. **The Pedestrian was distracted by cell phone use when walking in the crosswalk, which impacted their situational awareness and risk assessment of the approaching forklift (Contributing Cause 4).**
- **Inadequate Risk Perception:** When entering the crosswalk, the Pedestrian believed the forklift would stop and did not adequately perceive the risk that the Forklift Operator would not see them or would be unable to stop in time (**Local Root Cause 1**). The Pedestrian assumed that the forklift would see them and stop in accordance with New York State Rules of the Road and BNL right-of-way rules. The Pedestrian was unfamiliar with the impaired visibility and slow stopping time of forklifts. The Pedestrian stepped into the crosswalk without confirming that the Forklift Operator had visually identified them. Per the U.S. Department of Transportation, a best practice for pedestrian safety is to make eye contact with drivers when possible and wait for a clear, complete stop before crossing.

3.1.3 Forklift Operator's Actions

The AIB identified human performance, specifically inadequate surveillance by the Forklift Operator, as an element of this event. BNL designated on-road driving of forklifts as worker-planned work and therefore relied primarily on the human performance of the Forklift Operator instead of relying on a hierarchy of controls to prevent or mitigate the accident. The BNL Forklift Safety Program incorporates the National Consensus Standard for Low Lift and High Lift Trucks, which was developed by the American National Standards Institute and the Industrial Truck Standards Development Foundation (ANSI/ITSDF). The ANSI/ITSDF standard makes clear that it is the operator who is responsible for the safe operation of a power industrial truck or forklift. Furthermore, ANSI/ITSDF and OSHA both specify that the operator of a forklift is to observe all traffic regulations, keep a clear view of direction of travel, and keep the forklift under control. ANSI/ITSDF also specifies that forklift operators are to yield to pedestrians.

BNL placed the Forklift Operator in a situation where the main hazard control was their ability to identify and avoid negative interactions. On the morning of July 1, 2026, the Forklift Operator failed to operate the forklift in a safe manner, resulting in significant injuries to the Pedestrian:

- **Inadequate Surveillance by Forklift Operator:** Because of the normalized passing behavior of other drivers, the Forklift Operator felt it was necessary to move closer to the right side of the road to facilitate passing. **The Forklift Operator exercised inadequate surveillance by focusing on moving to the right of the lane and monitoring passing vehicles, resulting in decreased attention to**

pedestrians (Contributing Cause 3). Inadequate surveillance, as defined by the U.S. Department of Transportation, occurs when a driver is in a situation where they either fail to look in the appropriate place, or look, but do not see. By not taking the operating actions necessary to identify and yield to the Pedestrian, the Forklift Operator failed to operate the forklift safely. The Forklift Operator also had the ability to stop work if they felt the task at hand did not have adequate risk controls in place. However, they chose to proceed.

Due to the above choices and actions of the Pedestrian and the Forklift Operator, **the Forklift Operator failed to see the Pedestrian and failed to stop at the crosswalk (Local Root Cause 2)**, which precipitated the forklift striking the Pedestrian.

3.1.4 Conclusions

Based on this evaluation, the Board reached the following conclusions:

- **CON 1:** The Pedestrian was distracted while walking. This affected their situational awareness and risk perception and contributed to the fact that they did not stop walking in the crosswalk or take other evasive action.
- **CON 2:** Repeated instances of personnel not following procedures in multiple disciplines that the Board reviewed suggest a laboratory culture that normalizes noncompliance.
- **CON 3:** The Forklift Operator exercised inadequate surveillance, which led to not visually identifying the Pedestrian approaching the crosswalk.

3.2 FORKLIFT PROGRAM AND FEATURES

The AIB evaluated BNL's Forklift program and specific features of the forklift involved in the accident on July 1. The AIB concluded that BNL's Forklift program overlooked risk-mitigation activities and tools, especially as related to on-road driving.

Forklift operations at BNL are governed by the DOE's Worker Safety and Health Program under Title 10 of the *Code of Federal Regulations*, Section 851 (10 CFR 851); OSHA under 29 CFR 1910.178, Powered Industrial Trucks; and BNL's SBMS subject area for Forklift Safety.

BNL's ES&H Directorate develops and maintains the Forklift Safety subject area. It describes the required procedures for operating forklifts and other powered industrial trucks, approving attachments, and conducting inspections. It also serves as the primary mechanism for implementing Integrated Safety Management (ISM) principles for this scope of work. BNL divisions that include forklift operations are responsible for implementing the Forklift Program.

The Board examined the forklift, maintenance records, and a post-accident forklift operational review, which included running the forklift and testing braking capability. The forklift was equipped with running lights, brake lights, a 4-inch-diameter mirror mounted in the upper left corner of the cab, and a slow-moving vehicle triangle affixed to the rear of the forklift. The forklift worked as intended, and the Board concluded that maintenance or operational degradation were not contributing causes of the event.

AIB brake testing reenactments repeatedly showed the same one-tire skid-mark pattern observed at the accident site. The AIB could not determine why the left tire left a distinct skid mark, while the right tire did not.

However, the AIB determined that the brakes and tires were serviceable and performed to standard expectations, and the one visible skid mark was not an indication of any mechanical deficiency.

The AIB's review identified significant weaknesses in both the content and implementation of training within BNL's Forklift Program (for more details, see Section 3.4, Training).

3.2.1 Analysis of Specific Equipment Hazards and Refueling Practices

BNL designated the act of driving the forklift from the work area to the motor pool for refueling as worker-planned work. Worker-planned work requires that line management ensure a work authorization process is in place, all hazard controls are in place, and hazard control methods are used based on the hierarchy of controls. However, **BNL did not conduct a documented hazard analysis for on-road forklift operations, resulting in failure to identify and implement measures to prevent forklifts striking pedestrians (Systemic Root Cause 2)**. Refueling decisions were framed and authorized in a manner that transferred an abundance of risk-management responsibility to the Forklift Operator instead of relying on systematic identification of hazards and implementing controls. Furthermore, physical forklift features and routine refueling habits directly contributed to the accident conditions:

- **Visibility and Equipment Design Limits:** The forklift involved in the accident weighed 15,560 pounds and was equipped with 72-inch-long forks, the longest forks this model of forklift is allowed to use. Although the forklift was regularly maintained, recently serviced, and free of mechanical deficiencies, its design inherently limits operator visibility. **Visual obstruction due to the forklift's left mast, the speed of the forklift, and the speed of the Pedestrian resulted in continuous occlusion of the Pedestrian (Contributing Cause 6)**, as illustrated in Figure 10. This obscured the Pedestrian during the critical window when the Pedestrian was in the crosswalk. BNL did not identify or mitigate these equipment-specific hazards.

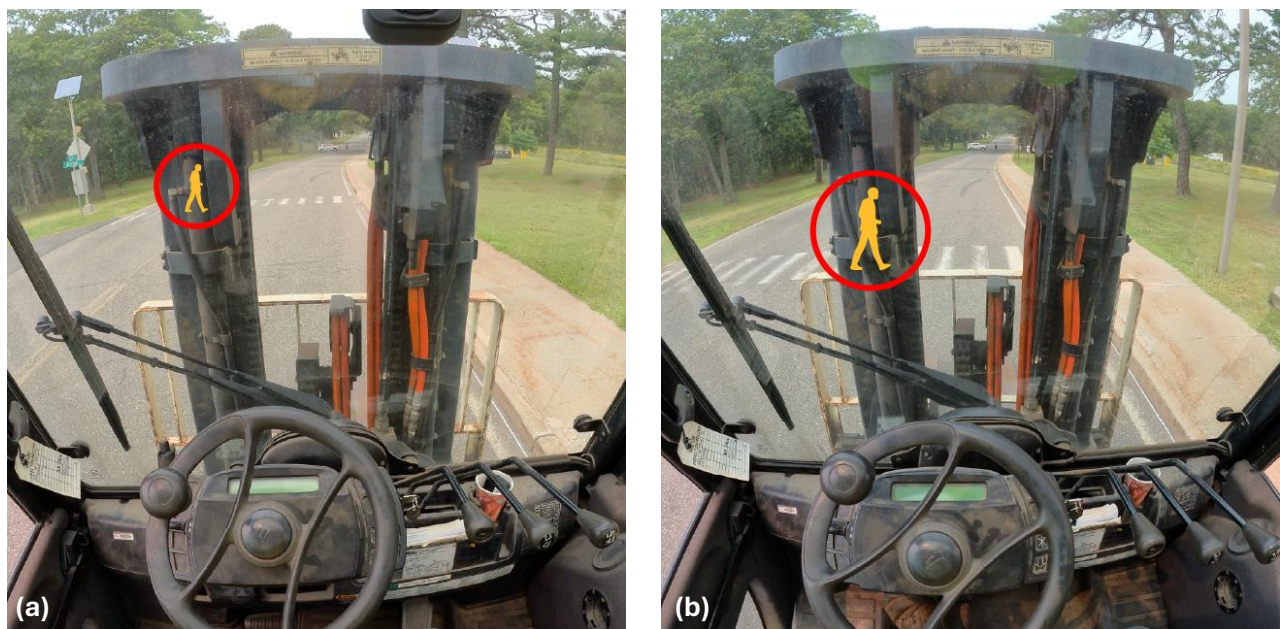


Figure 10: View from an operator's perspective while in forklift. Images depict continuous occlusion of pedestrian (circled) in the crosswalk at (a) approximately 3 seconds before impact and (b) less than 1 second before impact (from accident re-creation on July 14, 2026).

- **Engineering Controls and Safety Features:** The forklift lacked additional available safety technologies such as a pre-use inspection ignition interlock system; warning, directional, and/or safety lights; enhanced frontal visibility cameras; proximity sensors; pedestrian and presence-detection systems; audible alerts; or automatic braking. Without any engineering or administrative controls on the forklift, BNL relied almost entirely on the Forklift Operator's skill to operate the forklift safely in the presence of pedestrians. **The forklift did not have additional installed safety features that could have alerted the Forklift Operator or Pedestrian prior to the collision (Contributing Cause 5).**
- **Use of Escort Vehicles:** Escort vehicles, also referred to as pilot cars or lead and chase vehicles, are specially equipped vehicles with warning devices and a communication system used to alert other road users of upcoming trucks or convoys and ensure traffic safety. Escort vehicles are typically used when the load vehicle has an oversized or hazardous load, takes up more than one lane, has reduced visibility, or requires an escort for any other reason. BNL required the use of escort vehicles for forklifts on roadways when the forklifts had a critical load or a load that obstructed a forklift operator's vision. BNL did not require or routinely use escorts for *unloaded* forklifts. The forklift involved in the accident was unloaded and did not have an escort.
- **Refueling Normalization:** Some BNL operators commonly drove forklifts across main laboratory roadways to refuel at the diesel station adjacent to Building 423 rather than requesting on-site fuel delivery. Between January 1, 2026, and July 10, 2026, BNL forklifts from multiple directorates refueled 30 times at the Building 423 refueling station. This practice was based on the unverified assumption that fuel truck delivery would be unavailable or take too long, despite the routine availability of multiple qualified fuel truck drivers. Consequently, this practice placed an unescorted, unloaded forklift with restricted forward visibility on multi-use roadways unnecessarily. **BNL allowed the common practice of driving to refuel instead of calling for a fuel truck, which resulted in the forklift being on the roadway (Systemic Root Cause 1)** at the time of the accident.

3.2.2 Conclusions

Based on the evidence and analysis of the Forklift Program, the Board reached the following conclusions:

- **CON 4:** Involved forklift was regularly maintained, recently serviced, and mechanical deficiencies were not a factor in the accident.
- **CON 5:** BNL did not install additional available safety features that would have provided advance warning to the Forklift Operator and the Pedestrian.
- **CON 6:** The common practice of driving to refuel instead of calling for a fuel truck resulted in the unescorted forklift driving on the roadway unnecessarily.

3.3 TRAFFIC SAFETY

The AIB evaluated BNL's Traffic Safety Program as it related to the collision between the forklift and the Pedestrian in a crosswalk on a main laboratory road. The AIB determined this accident occurred in an operational environment that relied on human performance and overlooked tools to reduce risk.

BNL's ES&H Directorate develops and maintains the SBMS subject area for Traffic Safety. It describes BNL traffic regulations, traffic citations, bicycle regulations (including electric bicycles and scooters), and railroad car safety. This policy applies to all staff and guests. The Traffic Safety Subject Area does not include any training requirements for employees or guests.

3.3.1 Committee Structure and Approach

BNL's Traffic Safety Committee reports to and advises the Associate Laboratory Director for ES&H. Per the SBMS subject area for Worker Safety and Health, the Traffic Safety Committee is charged with

“evaluating, advising and recommending traffic safety improvements, communicating with employees who submit traffic safety concerns, and following up with traffic safety action owners to ensure closure of each improvement action item.”

In its review of the BNL Traffic Safety Program, the AIB determined that **the BNL Traffic Safety Committee did not have sufficient authority and accountability to comprehensively advance traffic safety on-site (Contributing Cause 7)**. The traffic safety subject matter expert conducted traffic safety self-assessments in 2022 and 2025. However, these were predominately based on internal document reviews and interviews.

The Traffic Safety Committee relies heavily on employee submissions to identify concerns. The AIB assesses that the committee structure did not have sufficient resources or decision-making authority; therefore, many of its responses focused on communication (including safety campaigns and direct feedback to staff). In addition, the committee reports to ES&H, but many of the potential actions discussed by the committee (e.g., road or sidewalk improvements) would be funded and completed by the Facilities and Operations Division.

3.3.2 Crosswalk Design and Signage

Based on this accident, the Board notes that **the crosswalk configuration and signage were ineffective to alert the Forklift Operator to the Pedestrian's presence (Contributing Cause 9)**. Specifically, the sign alerting Upton Road drivers to the crosswalk at Mitchell Lane flashes continuously, regardless of whether a pedestrian is in the crosswalk. In addition, Mitchell Lane, the road that leads from Curie House to the crosswalk, does not have a sidewalk. This compels pedestrians to walk either in grass or on the road. The Board noted that BNL had not conducted a safety engineering analysis to evaluate roads, signage, crosswalks, and pedestrian interactions across the laboratory.

3.3.3 Slow-Moving Vehicles in Traffic

BNL does not identify the hazards of forklifts (or any slow-moving vehicles) on-site. **BNL permitted forklifts to drive unescorted on roadways when unloaded, resulting in an operator driving a forklift with obscured vision (Systemic Root Cause 3)**. The BNL Traffic Safety Subject Area only has one provision related to slow-moving vehicles on roads, which states that such vehicles should be identified by a fluorescent emblem and that other drivers should “extend the same courtesy to them as given to pedestrians and bicyclists.”

At the location of the accident, Upton Road is a two-lane road separated by a solid double yellow line. New York State Rules of the Road, which BNL adopted, prohibit crossing a double yellow line to pass a vehicle. However, video recordings showed three vehicles crossing the double yellow line to pass the forklift, and a fourth preparing to pass. Based on these recordings and information from interviews, the Board determined that **BNL culture has normalized passing slow-moving vehicles, even across double yellow lines, which creates a risk of forklift operators exercising inadequate surveillance of the path ahead (Contributing Cause 8)**.

3.3.4 Conclusions

Based on the evidence and analysis of BNL's traffic safety, the Board reached the following conclusions:

- **CON 7:** BNL does not have clear lines of roles, responsibilities, authorities, and accountability for traffic safety.
- **CON 8:** BNL has not completed a traffic safety engineering analysis to evaluate roads, signage, crosswalks, and pedestrian interactions across the laboratory.
- **CON 9:** BNL culture has normalized passing slow-moving industrial vehicles across double yellow lines; this created an unsafe traffic environment.
- **CON 10:** Passive pedestrian crosswalk signage does not alert drivers to the presence of a pedestrian in a crosswalk.
- **CON 11:** BNL did not adequately identify and analyze the hazards of routine forklift roadway travel, resulting in a failure to develop and implement effective controls consistent with Integrated Safety Management System (ISMS) principles.

3.4 TRAINING

The AIB evaluated BNL's training program, including the specific training provided to both the Pedestrian and the Forklift Operator. The AIB concluded that weaknesses in BNL's training were causal factors to the accident.

3.4.1 *Pedestrian's Training*

The Pedestrian received the following training:

- **Guest Orientation Training:** BNL has separate training requirements for employees and guests. As an intern, the Pedestrian was subject to guest training requirements and completed the BNL Guest Orientation Training Course online in December 2025. The Guest Orientation Training Course appropriately covered crosswalk safety; however, it did not explicitly cover the unique hazards that forklifts, or other industrial vehicles, pose to pedestrians due to these vehicles' limited visibility and slow stopping abilities.
- **Summer Intern Program Orientation:** The Pedestrian attended the in-person Summer Intern Program Orientation on June 1, 2026. As part of the orientation, BNL Police and BNL Fire Rescue delivered presentations on health, safety, and security. The orientation training clearly covered pedestrian safety, bicyclist safety, and past student injuries. It also covered pedestrian and bicyclist safety, including limited warnings of distraction. However, the training did not explicitly cover walking while looking at a cell phone or with headphones, nor did it cover the unique hazards that forklifts, or other industrial vehicles, pose to pedestrians.

On July 1, the Pedestrian saw the approaching forklift, knew the operator of the forklift was required to stop for a pedestrian in a crosswalk, and proceeded to cross. However, **when entering the crosswalk, the Pedestrian believed the forklift would stop and did not adequately perceive the risk that the Forklift Operator would not see them or would be unable to stop in time (Local Root Cause 1)**. The Pedestrian saw the forklift but did not fully appreciate the Forklift Operator's limited visibility or slow stopping time. The Pedestrian's lack of awareness about the risks posed by forklifts or other industrial vehicles, combined with distracted walking, led to their decision to proceed into and across the crosswalk despite seeing the forklift.

3.4.2 Forklift Training

Forklift Operator's Training and Qualification

The Forklift Operator has been a BNL employee since 1989 and was BNL-trained and qualified to be a Forklift Operator in 2004. Every 3 years, BNL forklift operators are required to take the online Forklift Operator Course and the Forklift Practical hands-on skills assessment (requalification). BNL's 3-year requalification requirement aligns with OSHA requirements to evaluate an operator's performance once every 3 years and to certify the operators' training.

The Forklift Operator most recently completed the full online Forklift Operator Course in June of 2020. The Forklift Operator tested out of the online course in January of 2024. BTMS counted the test-out as completing the required online training.

The Forklift Operator last completed the Forklift Practical on June 12, 2023. The Forklift Operator's qualification expired on June 12, 2026. The Forklift Operator did not recognize or communicate the expired qualification status despite receiving repeated notifications from BTMS. The Forklift Operator's supervisor also did not recognize the expired training, despite multiple BTMS notifications. The Forklift Operator's division did not routinely review qualifications to verify an operator's status. Repeated BTMS notices remained at the supervisor and operator level; there was no escalation to division management, ES&H management, or the issues-management system.

On the day of the accident, the Forklift Operator's training remained expired, and therefore they were unauthorized to operate a forklift. The supervisor did not verify training prior to assigning work to the Forklift Operator. BNL had no formal process in place to dispatch forklifts; such a process could have included a verification of qualifications as part of the dispatch process. BTMS was not integrated with key control, equipment dispatch, digital access, or supervisor authorizations. The Forklift Operator, supervisors, training systems, and management systems failed to prevent an operator with an expired practical qualification from operating the forklift.

This expired qualification was not an isolated incident. During their time at BNL, the Forklift Operator has been required to complete retraining and requalification seven times. On three of seven occasions, the Forklift Operator failed to complete their online Forklift Operator Course on time. On five of seven occasions, the Forklift Operator failed to complete their Forklift Practical hands-on skills assessment on time. In each case, the late completion of the training resulted in an expired and invalid certification. The AIB did not assess whether the Forklift Operator operated a forklift during each of the expired time periods because it is not directly relevant to the accident. However, this frequent occurrence of federally required training expiring is concerning and suggests programmatic deficiencies and a lack of management accountability.

The repeated expiration of required training, the absence of an effective escalation process, and the failure of supervisory and administrative systems to prevent forklift operations by an unauthorized operator reflected a broader compliance weakness. Accordingly, the Board identified that **BNL's culture of normalizing noncompliance with site procedures contributed to the failure to prevent an operator with an expired practical qualification from driving the forklift (Contributing Cause 2).**

Forklift Online Training

The online Forklift Operator Course was not comprehensive and had a dated, read-only interface. BNL established the training course as a requirement for forklift operators over 20 years ago, and had not updated the training since that time. The training failed to capture changes that have occurred over the last 20 years in

the forklift fleet, available technologies, site conditions, prior experience of the operators, and OSHA and ANSI/ITSDF standards.

Although much of the online training's content was still valid and relevant at the time of the accident, it did not emphasize the operator's responsibilities; did not address all operations or conditions that operators are expected to perform; and did not expressly address on-road driving, crosswalk protocols, horn usage, or proper surveillance techniques. The training content indicated that forklifts should not exceed a speed of 5 MPH, but the course did not specify if this was guidance or a requirement, or if the speed limit applied outside of a warehouse setting. The training was on par with an introductory forklift awareness course and did not contain the level of rigor and detail required to train BNL employees who are expected to operate at a high level of performance in a National Laboratory, including performing advanced lifts and transportation tasks. The exam at the end of the course was not challenging or comprehensive, and it was limited to 10 multiple-choice questions. BNL online training was less rigorous, less comprehensive, and had a more passive interface than training programs, courses, and instruction available from private vendors.

Prior to the accident, BNL had previously self-identified the outdated online training curriculum. In 2024, BNL conducted a Subject Area Assessment on the Forklift Program. The assessment had a limited scope of review (i.e., OSHA only) and did not evaluate on-road driving or operator qualification adherence. Even with the limited scope, the assessment identified five Opportunities for Improvement (OFIs), including outdated training content. BNL did not act on the OFI related to outdated training. The training content at the time of the accident was the same as it was during the 2024 self-assessment.

Forklift Practical Evaluators

The implementation of forklift practical training was inconsistent across BNL and inadequate at the Collider-Accelerator Department. BNL did not have a formalized Forklift Evaluator Qualification, which would normally include the establishment of evaluator criteria, training, retraining, quality assurance, and supervision of an evaluator's work. The lack of a formal Forklift Evaluator Qualification led to a variation in evaluator skills and abilities and inconsistent examination rigor.

Forklift Practical

The content of the Forklift Practical hands-on skills assessment was not comprehensive enough to evaluate forklift operators on different types of hazards or equipment that they might encounter while working at BNL. Specifically, the Forklift Practical did not assess an operator on roadways and only tested an operator on a single type of forklift. The Forklift Practical did not include clear requirements for an operator to demonstrate proficiency in multiple equipment types or lifting capacities, attachments, visibility limitations, and road-use configurations. BNL did not test operators' ability to execute a standardized sequence of actions requiring early speed reduction, brake coverage, horn warning, left-right scan, pedestrian-clearance confirmation, and yielding at intersections and crosswalks. Overall, BNL's Forklift Practical content and implementation did not evaluate forklift operators' expected operational scope and was less rigorous than industry-standard training options.

BNL's outdated forklift online course, incomplete practical assessment, and inconsistent evaluator qualification process did not address on-road driving, resulting in the Forklift Operator not being prepared for all hazards they would encounter (Contributing Cause 10).

3.4.3 Conclusions

Based on the evidence and analysis of BNL's training program, the Board reached the following conclusions:

- **CON 2:** Repeated instances of personnel not following procedures in multiple disciplines that the Board reviewed suggest a laboratory culture that normalizes noncompliance.
- **CON 13:** Student safety orientation and traffic safety messaging campaigns clearly communicated lab expectations for pedestrian, bicyclist, and automobile safety in most areas, but did not address the hazard of industrial vehicles to pedestrians.
- **CON 14:** BNL supervisors and training systems failed to prevent an operator with an expired practical qualification from driving the forklift.
- **CON 15:** Online training, Job Performance Measure (JPM) practical training, and forklift procedures were incomplete and did not address all conditions and hazards operators would encounter. Specific gaps included on-road usage (crosswalks, horn use, restricted visibility, pedestrian right-of-way, mixed traffic) and addressing all classes/types of forklifts.

3.5 RESPONSE

3.5.1 Response by Bystanders and Participants

In the immediate aftermath of the accident, multiple BNL personnel rushed to the scene of the accident and provided valuable comfort and support to the Pedestrian until emergency personnel arrived. However, the AIB observed multiple issues related to calls to emergency services by the Forklift Operator and accident bystanders:

- After the accident, the Forklift Operator called their supervisor before calling BNL emergency services. The Forklift Operator noted difficulty operating the cell phone; the AIB assesses this was likely due to shock from the accident.
- When the Forklift Operator called BNL emergency services 2 minutes after the accident, the Forklift Operator hung up before speaking to anyone. The AIB assesses that the Forklift Operator's call was likely automatically forwarded to the nonemergency services number and that the Forklift Operator was confused by this and hung up on the call.
- Bystander 1 called 9-1-1. Bystander 1 recalled BNL training to call the on-site emergency services number instead of 9-1-1, but could not find or remember the number at the time of the accident.
- Driver 5 drove to the nearby BNL Police Headquarters to report the incident, rather than calling the on-site emergency services number from their cell phone. The AIB assesses that this was due to a misunderstanding between Drivers 4 and 5.

The AIB assesses that these challenges in calling emergency services resulted in a delay of approximately 1 to 2 minutes in the medical response, which did not impact the outcome of this accident. BNL Fire Rescue delivered excellent medical care and got the patient to the hospital within the "golden hour," representing the critical period when timely care is essential for survival.

Although BNL bystanders demonstrated care and bravery in their response to the accident, these facts demonstrate gaps in understanding regarding both the priority of calling emergency services immediately after an accident and how to contact emergency services on-site. The AIB noted a strong emphasis in BNL training materials that staff should call supervisors in the event of serious incidents and emergencies. This may have contributed to delays in calling emergency services following this accident.

3.5.2 Medical Response

BNL Fire Rescue was responsible for the medical response to the accident. BNL Fire Rescue arrived at the scene of the accident approximately 1 minute after receiving the emergency dispatch notification from Suffolk County Fire, Rescue and Emergency Services. This short response time demonstrates a high level of readiness and strong integration of communication systems with Suffolk County; this mitigated the impact of the initial call going to 9-1-1 rather than the BNL on-site emergency services number.

The AIB assesses that BNL Fire Rescue delivered high-quality medical care to the Pedestrian, including stabilization, bandaging and splinting, and administration of pain medication. Furthermore, BNL Fire Rescue's decision to immediately request medevac resulted in the Pedestrian arriving at the hospital within 1 hour of the accident.

3.5.3 Scene Preservation, Evidence Preservation, and Accident Investigation

BNL Police were responsible for scene and evidence preservation at the accident. Once SCPD and the FBI declined to investigate, BNL's ES&H Directorate was responsible for conducting the subsequent accident investigation.

After receiving the initial notification from Driver 5, BNL Police arrived at the scene at approximately the same time as BNL Fire Rescue. This demonstrates a high level of readiness. BNL Police collected the Pedestrian's belongings and separated and monitored the Forklift Operator and three witnesses (Driver 4 and Bystanders 1 and 2).

However, BNL Police removed some evidence from the scene (including the Pedestrian's belongings) before the items were photographed in their original locations. In addition, at least two potential witnesses (Bystander 3 and Driver 5) who were on scene in the immediate aftermath of the accident were sent away without providing official statements to the BNL Police.

Further, Driver 5's vehicle was equipped with a dashboard camera that may have recorded the accident on video, but BNL Police did not inquire about any potential video from the vehicle. The dashboard camera had limited storage space, with video automatically deleted on a rolling basis as the space filled up. The footage from July 1 had already been automatically deleted by the time the AIB identified Driver 5 and requested the data. This evidence may have been beneficial to the Board's investigation.

BNL's status as an exclusive federal enclave created confusion about jurisdiction and roles and responsibilities on the day of the accident. The FBI has the primary role in law-enforcement activities at BNL, but the AIB assesses that the FBI is unlikely to investigate an incident of this nature. The FBI deferred to the SCPD to investigate the accident, and SCPD ultimately chose not to deploy an investigative team because they determined that the Pedestrian's injuries did not constitute SPI under New York State law. DOE protective force officers, including the BNL Police Department, do not have the capability or authority to investigate vehicular accidents. As such, no law enforcement organization was positioned to investigate the accident. The scene was turned over to BNL ES&H to perform fact finding.

The AIB assesses that the absence of a law enforcement investigation was driven by the facts of the case, including the nature of the Pedestrian's injuries and the absence of any apparent criminal factors such as malice, intoxication, or reckless speed, and that jurisdictional issues related to the BNL/SCPD MOU and BNL's federal enclave status contributed to this outcome.

After SCPD's decision not to initiate an investigation, BNL Police took written statements from the Forklift Operator and three witnesses. These statements provided valuable information regarding the accident. However, the BNL Police did not review video evidence to identify other drivers who could have been witnesses (Drivers 1, 2, and 3, who passed the forklift prior to the accident, or Driver 5, who was in the second vehicle behind the forklift and reported the accident). In addition, BNL Police did not ask to examine the Forklift Operator's personal cell phone. The AIB subsequently reviewed the Forklift Operator's cell phone call logs, which were provided voluntarily. The AIB confirmed that the Forklift Operator was not making a phone call at the time of the accident.

Finally, the Forklift Operator's written statement indicated that when they initially attempted to brake, their foot slipped off the brake, possibly due to diesel fluid on their shoe. However, BNL Police did not inspect the Forklift Operator's shoes or the forklift for evidence of diesel fuel. This evidence may have been beneficial to the Board's investigation.

BNL ES&H took measurements and photos at the accident scene, which were useful for the AIB's understanding of the event. During multiple phone calls, Office of Science Headquarters instructed BNL to continue fact-finding but not conduct causal analysis. However, BNL leadership misunderstood or miscommunicated this instruction and directed the ES&H team to halt their investigation to avoid preempting or conflicting with the imminent AIB. BNL's decision to entirely halt the investigation was another missed opportunity to collect time-sensitive evidence related to the accident.

3.5.4 Conclusions

Based on the evidence and analysis of BNL's response to the accident, the Board reached the following conclusions:

- **CON 16:** BNL Fire Rescue provided superb initial response to the injured Pedestrian and immediately requested air medivac services, which resulted in the Pedestrian getting to the hospital within the medical "golden hour."
- **CON 17:** Bystanders made notifications and provided valuable comfort and support to the Pedestrian until emergency personnel arrived.
- **CON 18:** BNL failed to comprehensively investigate the accident and to collect several witness statements and pieces of evidence that were potentially important to understanding the accident.
- **CON 19:** BNL's status as an exclusive federal enclave makes law enforcement investigations complex, and BNL does not have effective processes and procedures for navigating this complex environment.

4 CONTRACTOR ASSURANCE, HUMAN PERFORMANCE, AND INTEGRATED SAFETY MANAGEMENT

4.1 CONTRACTOR ASSURANCE AND OVERSIGHT

For this investigation, the AIB considered oversight in terms of roles, responsibilities, and expectations to verify implementation of worker safety and health requirements.

4.1.1 Contractor Assurance

Per the contract between DOE and BSA, BSA is responsible for ensuring work is performed safely and within requirements of the contract and federal laws. BSA does this through their CAS. The CAS is a set of assurance functions and processes designed to assure the quality, relevance, and timely delivery of BNL's science and technology objectives. The BHSO approves the CAS, performs oversight, and provides performance feedback to ensure the BNL CAS is effective.

BSA performs annual assessments of CAS effectiveness. The most recent assessment was completed in August 2025 and included team members from within BSA and other DOE laboratories. The assessment covered nine elements and concluded that BNL's CAS program is robust and generally well-integrated, and that the CAS is generally effective across six elements and partially effective for the remaining three elements (early identification of trends, notification of changes to the contracting officer, and metrics and targets). Notably, the assessment rated the element of credible self-assessments as generally effective.

The assessment did identify the need to improve the timeliness and clarity of corrective actions and causal analysis processes. It also identified the need for "focused messaging between Executive Leadership and BHSO leadership directed at key outcomes and actions stemming from assurance activities (i.e., event response, corrective action management, metrics trends)." The AIB reviewed traffic safety, forklift safety, and lifting safety self-assessments and confirmed that the self-assessment program is generally effective; the AIB also confirmed the opportunities for improvement noted in the self-assessment.

4.1.2 Oversight

Risk Registry: BHSO performs oversight using a risk-based process that is underpinned by the BHSO Enterprise Risk Management process, which results in an Institutional Risk Registry. BHSO uses the risk registry to prioritize and manage a set of institutional risks including strategic, operations, compliance, and reporting. In 2024, BHSO identified vehicle safety and CAS effectiveness as institutional risks but removed these risks from the registry in 2025 based on the laboratory's strengthened messaging to the workforce on traffic safety issues such as stop sign compliance. BHSO continues to track vehicle safety and CAS effectiveness at the division level through periodic meetings with BNL's ES&H and Facilities and Operations Directorates and routine field observations. In addition, BHSO tracks vehicle damage costs. However, BHSO did not conduct any assessments of vehicle safety while vehicle safety was on the risk register.

Performance Feedback: BHSO uses the Performance Evaluation Management Plan to define annual performance expectations and assess performance. The Fiscal Year (FY) 2025 Performance Evaluation Report was issued in December 2025 and identified the number of vehicle accidents as a concern. BHSO specifically noted, "vehicle accidents continue to be a concern for BHSO and the Laboratory from both a safety and property management perspective." BHSO stated, "sustained focus and improvement in vehicle safety are critical for BSA." BHSO reiterated this statement in the FY26 midyear report, which demonstrates

performance had not changed since December 2025. In the FY26 midyear report, BHSO included performance feedback on vehicle accidents only in the property section, primarily due to costs associated with government vehicle damage.

4.1.3 Conclusion

Based on the evidence and analysis of BHSO's oversight, the Board reached the following conclusion:

- **CON 12:** BHSO identified vehicle safety as a key laboratory-wide risk in 2025 but did not incorporate vehicle safety into the site office's assessment schedule.

4.2 HUMAN PERFORMANCE IMPROVEMENT ANALYSIS

The Board evaluated human performance using the error-precursor framework in DOE-Handbook-1028-2009, *Human Performance Improvement Handbook*, Volume 1, Chapter 2, Attachments A and B. Human performance error precursors are not causes by themselves; rather, they describe conditions that can increase the likelihood of error or reduce the reliability of successful performance. The Board therefore evaluated the actions of the Forklift Operator, Pedestrian, supervisors, managers, and responders within the context of the work practices, equipment, traffic environment, training, procedures, and organizational defenses that influenced those actions.

The analyses identified a recurring set of error precursors. The most prominent were inaccurate risk perceptions; complacency or overconfidence; unclear standards; assumptions; unclear goals, roles, or responsibilities; habit patterns; distractions or interruptions; simultaneous or multiple actions; mental shortcuts or biases; and lack of an alternative indication. These precursors existed across multiple organizational levels at BNL and combined to create an error-likely situation in which safe performance depended heavily on individual vigilance rather than layered and reliable organizational defenses.

4.2.1 Immediate Human Performance at the Crosswalk

The Forklift Operator was focused on moving toward the right side of the lane to accommodate vehicles that were passing or attempting to pass. Simultaneous actions and distractions resulted in the Forklift Operator allocating attention away from the forklift's primary path of travel and the pedestrian hazard.

At the same time, the forklift's left mast restricted the Forklift Operator's forward field of view. The relative movement of the forklift and Pedestrian resulted in continuous occlusion of the Pedestrian during the final seconds before the accident. The Forklift Operator did not identify the Pedestrian before impact and did not apply the brakes until after the collision. The forklift's brakes functioned as designed; however, they could not by themselves prevent the accident because effective braking remains dependent on timely hazard recognition, operator reaction, and adequate stopping distance.

The Board identified inaccurate risk perception, habit patterns and mental shortcuts, distractions, and lack of alternative indication as important precursors affecting the Forklift Operator's performance. The Forklift Operator had not been trained or evaluated on protocol for on-road crosswalk approaches, restricted visibility, mixed traffic, or use of the horn where vision was obstructed. The roadway and equipment also provided no active backup to alert the operator to a pedestrian: the warning sign flashed continuously rather than in response to a pedestrian, and the forklift did not have a visibility camera, proximity warning, pedestrian-detection system, dynamic speed control, automatic braking, or any other safety system to assist the operator in detecting pedestrians or other obstructions. As a result, the system relied on the Forklift

Operator seeing the Pedestrian at the correct moment despite the mast obstruction and competing roadway demands.

The Pedestrian was late for work, walking quickly, attempting to place a cell phone call, and using one earbud. These conditions introduced time pressure, distraction, and simultaneous actions. The Pedestrian saw the approaching forklift and believed it would stop in accordance with New York State Rules of the Road and BNL requirements that give the right-of-way to pedestrians in a crosswalk. That expectation, combined with unfamiliarity with the forklift's visibility limitations and stopping characteristics, reflected assumptions and inaccurate risk perception. The cell phone use and quick pace reduced the Pedestrian's situational awareness and likelihood of reassessing the hazard, stopping, or taking evasive action after entering the crosswalk.

4.2.2 Supervisory and Programmatic Influences

The immediate performance errors occurred within a broader system that did not consistently establish, reinforce, or verify the standards necessary for safe forklift roadway operation:

- The Forklift Operator's expired qualification did not equate to lack of operating experience. However, the lapsed qualification and the fact that no one in the BNL system acted to verify training reflected complacency or overconfidence, mental shortcuts, unclear roles or responsibilities, and unclear standards. This supports the Board's conclusion that normalizing noncompliance with site procedures contributed to BNL's failure to prevent an operator with an expired practical qualification from driving a forklift.
- The training and qualification program further reduced the reliability of operator performance. The Forklift Training course and Forklift Practical were outdated and not comprehensive. BNL's 2024 Forklift Safety Self-Assessment recognized the need for revision, but BNL did not take action. These weaknesses created unclear standards, inconsistent interpretation of requirements, assumptions regarding operator proficiency, complacency or overconfidence, and ineffective feedback and improvement.
- Refueling decisions were framed and authorized in a manner that transferred an abundance of risk-management responsibility to the Forklift Operator. Driving the forklift from the work area to the motor pool for refueling was treated as worker-planned work, but BNL did not conduct documented hazard analysis and assess alternatives. These conditions demonstrate assumptions, inaccurate risk perceptions, mental shortcuts, and unclear standards.
- The Forklift Safety Subject Area contained general traffic safety requirements, but the requirement to maintain a clear view did not match the forklift's actual operating configuration or the roadway environment. BNL did not evaluate whether an operator could reliably maintain a clear view along the route; instead, BNL only established compensatory controls, such as use of an escort, for forklifts carrying loads. The general requirements were therefore not translated into task-specific controls for routine travel across a large, mixed-traffic site. Collectively, these issues reflect unclear standards, interpretation of requirements, assumptions that the general requirements were adequate for roadway use, and inaccurate risk perception regarding the effect of forklift configuration and roadway environment on operator visibility.
- Some driving practices, including passing slow-moving vehicles and crossing double yellow lines, were normal site practice at BNL. For forklift operators, repeated passing encouraged attention to shift toward vehicles approaching from behind and toward facilitating those vehicles' movement. For other drivers, the practice reduced the effectiveness of the double yellow line as a traffic-control

barrier. For the organization, the absence of a comprehensive traffic engineering analysis allowed continued reliance on passive signage, individual courtesy, and reactive concern resolution. BNL policies and assessments did not identify or address the risks posed by routine forklift roadway travel, mixed-traffic interactions, or crosswalk performance. The resulting environment reinforced habit patterns, complacency or overconfidence, inaccurate risk perceptions, and unclear goals, roles, or responsibilities.

4.2.3 *Defense-in-Depth and Recovery Indicators*

A central human-performance theme was the absence or weakness of defenses that could detect and recover from predictable human errors. BNL's systems did not prevent an operator with expired qualifications from accessing a forklift; did not require a documented hazard analysis for routine on-road refueling travel; did not establish a designated route, escort trigger, or standard crosswalk-approach protocol; did not provide a pedestrian-activated crosswalk warning; and did not equip the forklift with additional detection, warning, speed-control, braking, or other safety features. The operator's view was obstructed by the mast, yet no alternative indication compensated for that limitation.

These missing defenses made the safe outcome dependent on multiple people performing correctly at the same time: other drivers not passing, the Forklift Operator continuously monitoring the roadway despite the mast obstruction, the Forklift Operator slowing and sounding the horn without a standardized prompt, and the Pedestrian recognizing that although they had the right-of-way the operator might not see them. When several of these actions did not occur, no independent barrier remained to interrupt the accident sequence.

4.2.4 *Human Performance During Response and Investigation*

Human performance after the collision included both effective adaptation and additional error precursors. The Forklift Operator was likely experiencing stress and initially followed the familiar pattern of immediately calling the supervisor before attempting to contact the BNL emergency number. Bystanders also managed multiple actions under stressful conditions and did not immediately recall the full 10-digit BNL emergency number; however, Bystander 1 called 9-1-1, Suffolk County relayed the call to BNL Fire Rescue, and responders arrived promptly. Bystanders provided comfort and attempted first aid, and BNL Fire Rescue delivered a superb medical response that resulted in the Pedestrian reaching the hospital within the medical "golden hour." These actions demonstrate that personnel adapted effectively once the emergency-response system was engaged.

During scene preservation and investigation, performance was affected by unclear roles and responsibilities, unclear standards, and assumptions. Uncertainty regarding BNL's federal-enclave status and the respective responsibilities of the BNL Police, SCPD, and the FBI contributed to gaps in evidence and witness collection. A misunderstanding by BNL regarding Office of Science Headquarters direction to continue fact-finding but defer causal analysis resulted in BNL halting its investigation. These conditions did not cause the collision, but they reduced the quality of information available to understand the event. They demonstrate the need for clearer investigative roles, escalation paths, and evidence-preservation expectations.

4.3 INTEGRATED SAFETY MANAGEMENT ANALYSIS

BNL implements ISM pursuant to DOE O 450.2, Integrated Safety Management; DOE P 450.4A, Integrated Safety Management; and 10 CFR 851, Worker Safety and Health Program. The five core functions of ISM are Define Work, Analyze Hazards, Develop/Implement Controls, Perform Work, and Feedback and Improvement.

4.3.1 Define Work

In the case of this accident, the Forklift Operator's work activity was to refuel a forklift. BNL uses two methods to refuel diesel forklifts: drive to the diesel station adjacent to Building 423 with a BNL credit card or arrange for a fuel delivery using the work order system. The Forklift Operator and team lead assumed that fuel delivery would take too long or would be unavailable on the morning of July 1, 2026. However, they did not contact the fuel service to verify availability. BNL had no standard requiring the use of fuel delivery when practicable, nor did it establish a preferred route or escort trigger when roadway travel was unavoidable.

The Pedestrian, who lived in an on-site dormitory, walked to work every day. Their chosen route was the shortest path to Building 490, the work site, and included crossing at an established crosswalk to reach the sidewalk.

4.3.2 Analyze Hazards

DOE contractors are required to establish procedures to identify workplace hazards and assess their risks, including performing routine job activity-level hazard analyses. Furthermore, the CFR requires DOE contractors to implement a motor vehicle safety program to protect all drivers and passengers in government-owned or leased vehicles and powered industrial equipment.

BNL flows these requirements down through their approved Worker Safety and Health Program Description, dated April 2026. Forklift operations are governed by BNL's Forklift Safety Subject Area, which was last updated on May 27, 2026, in response to issues identified in the 2024 Forklift Safety self-assessment (none of the May 2026 changes impacted this event). This procedure also identifies the operator as the individual who must plan the work, assess operational and safety needs, identify risks, and implement, manage, or mitigate the hazards before operating forklifts. The operator is instructed to check the route for hazards or obstacles that could affect safe operation, to slow down and sound the horn at cross aisles and other locations where vision is obstructed, and to keep a clear view of the path of travel and watch for other traffic, personnel, and safe clearances.

Although the subject area gave general expectations, BNL considered the activity of driving to the diesel station adjacent to Building 423 a worker-planned work activity, even though it involved traversing a significant portion of the site across varied terrain and through mixed traffic. BNL's Work Planning and Control Subject Area states that worker-planned work can only be performed when "there are adequate controls in place to reduce the hazards to acceptable levels in the areas of environmental, safety, security and health and facility concerns, work complexity, and work coordination." This approach relied solely on the operator's judgment and did not include a formal Job Hazard Analysis. No documented hazard analysis evaluated the necessity of roadway travel, the suitability of the forklift size and route, pedestrian and vehicle exposure, crosswalk locations, visibility limitations, speed limits, road grade, or passing traffic. BNL did not have adequate site-wide controls for unloaded forklifts on roadways to reduce the hazards to acceptable levels.

The Pedestrian complied with state laws and the BNL campus safety practices covered during orientation. The BNL intern orientation briefing included information on basic pedestrian safety, but BNL did not identify specific hazards related to industrial vehicles or walking outside while using a cell phone or earbuds.

4.3.3 Develop and Implement Controls

BNL's Forklift Safety Subject Area contained general requirements to observe traffic regulations, maintain a clear view, and yield to pedestrians. These broad rules were never translated into task-specific controls for

routine travel across a large, mixed-traffic site. BNL failed to evaluate whether the operator could reliably maintain a clear view along the route or establish mitigating controls such as designated routes, lower approach speeds, mandatory stopping at intersections, horn use, escorts, or pedestrian-detection technology when direct vision was restricted.

The AIB assesses that, without a framework for hazard analysis, reliance on worker-planned work was not adequate for the specific hazards associated with driving a forklift on the main roads at BNL.

BNL has crosswalks and crosswalk signage across the site, which represent important controls for pedestrian safety. At the Upton Road–Mitchell Lane crosswalk, the pedestrian crosswalk sign had constant flashing lights. This passive indicator did not provide a signal to the Forklift Operator that the Pedestrian was in the crosswalk.

4.3.4 Perform Work

BNL's Forklift Safety Subject Area requires the operator to check the route for hazards or obstacles that could affect safe operation. The Forklift Operator was to keep a clear view of the path of travel and observe for other traffic and personnel and yield to pedestrians. By not taking the operating actions necessary to identify and yield to the Pedestrian, the Forklift Operator failed to operate the forklift safely. The Forklift Operator also had the ability to stop work if they felt the task at hand did not have adequate risk controls in place. However, they chose to proceed.

4.3.5 Continuous Feedback and Improvement

There are limited formal mechanisms for pedestrians and forklift operators to provide feedback on work activities. BNL staff can submit comments and complaints to the BNL Traffic Safety Committee; however, as discussed in Section 3.3, Traffic Safety, the AIB determined that the Traffic Safety Committee does not have sufficient expertise, resources, authority, or accountability to comprehensively lead traffic safety on-site. In addition, the AIB could not assess whether all staff and guests knew about the BNL Traffic Safety Committee or how to submit an issue.

Interviews with forklift operators identified the passing of forklifts on roadways as an issue, because they were often surprised by vehicles. Diesel forklifts are loud when driven and the accessories tend to bounce and create additional noise. The rearview mirror in the forklift involved in the accident was only 4 inches in diameter and was insufficient for providing visibility of vehicles behind the forklift. Forklift operators expected to be passed when driving a forklift around the site. The AIB did not identify any indication that these concerns had been communicated to supervisors or that controls had been evaluated to reduce the likelihood of interactions with other vehicles on site.

5 CAUSES

The direct cause is that the forklift struck the Pedestrian in the crosswalk. The Local Root Causes (LRCs), Systemic Root Causes (SRCs), and Contributing Causes (CCs) are listed in Table 2.

Table 2: Root and Contributing Causes

Category	Root Causes	Contributing Causes
Organization, Culture, and People	LRC 1: When entering the crosswalk, the Pedestrian believed the forklift would stop and did not adequately perceive the risk that the Forklift Operator would not see them or would be unable to stop in time. LRC 2: The Forklift Operator failed to see the Pedestrian and failed to stop at the crosswalk.	CC 1: Previous DOE forklift events did not provide sufficient corrective actions to prevent recurrence. CC 2: BNL's culture of normalizing noncompliance with site procedures contributed to the failure to prevent an operator with an expired practical qualification from driving the forklift. CC 3: The Forklift Operator exercised inadequate surveillance by focusing on moving to the right of the lane and monitoring passing vehicles, resulting in decreased attention to pedestrians. CC 4: The Pedestrian was distracted by cell phone use when walking in the crosswalk, which impacted their situational awareness and risk assessment of the approaching forklift.
Forklift Program and Features	SRC 1: BNL allowed the common practice of driving to refuel instead of calling for a fuel truck, which resulted in the forklift being on the roadway. SRC 2: BNL did not conduct a documented hazard analysis for on-road forklift operations, resulting in failure to identify and implement measures to prevent forklifts striking pedestrians.	CC 5: The forklift did not have additional installed safety features that could have alerted the Forklift Operator or Pedestrian prior to the collision. CC 6: Visual obstruction due to the forklift's left mast, the speed of the forklift, and the speed of the Pedestrian resulted in continuous occlusion of the Pedestrian.
Traffic Safety	SRC 3: BNL permitted forklifts to drive unescorted on roadways when unloaded, resulting in an operator driving a forklift with obscured vision.	CC 7: The BNL Traffic Safety Committee did not have sufficient authority and accountability to comprehensively advance traffic safety on-site. CC 8: BNL culture has normalized passing slow-moving vehicles, even across double yellow lines, which creates a risk of forklift operators exercising inadequate surveillance of the path ahead. CC 9: The crosswalk configuration and signage were ineffective to alert the Forklift Operator to the Pedestrian's presence.
Training	N/A	CC 10: BNL's outdated forklift online course, incomplete practical assessment, and the inconsistent evaluator qualification process did not address on-road driving, resulting in the Forklift Operator not being prepared for all hazards they would encounter.
Response	N/A	N/A

6 CONCLUSIONS AND JUDGMENTS OF NEED

The Board concludes that the accident on July 1, 2026, which resulted in severe injury to the Pedestrian, was preventable and directly attributable to systemic weaknesses at BNL that allowed for less than safe practices to occur on site. These failures created an environment where hazards were not adequately identified or controlled and noncompliance with site procedures was normalized. The Board has binned its conclusions into five categories:

1. Organization, Culture, and People
2. Forklift Program and Features
3. Traffic Safety
4. Training
5. Response

This was not simply a traffic accident that could have happened on any street. Per the Board's analysis, this accident could have been prevented if BNL had better assessed and understood the hazards of operating a forklift outside of the designated work site.

The forklift did not need to drive across the site to refuel. The operator did not slow down or use the horn upon approaching a crosswalk. Although the forklift was unloaded, its design obscured the operator's field of vision. The operator was out of compliance with training requirements, and the supervisor permitted the operator to use a forklift. Multiple vehicles passed over double yellow lines to pass the forklift, which caused the operator to inadequately surveil the road ahead. BNL's passive crosswalk signage did not alert the Forklift Operator to the presence of a pedestrian.

The Conclusions and Judgments of Need address the conditions described in this report by:

- Reducing forklift roadway exposure;
- Requiring comprehensive hazard analysis and stronger engineering and administrative controls;
- Improving traffic engineering and accountability;
- Revising training and qualification processes;
- Reinforcing procedural compliance;
- Strengthening pedestrian-safety messaging; and
- Improving emergency and investigation processes.

The AIB's detailed analysis leads to the conclusions described in Table 3.

Table 3: AIB Conclusions

Category	Conclusions
Organization, Culture, and People	CON 1: The Pedestrian was distracted while walking. This impacted their situational awareness and risk perception and contributed to the fact that they did not stop walking in the crosswalk or take other evasive action. CON 2: Repeated instances of personnel not following procedures in multiple disciplines that the Board reviewed suggest a laboratory culture that normalizes noncompliance. CON 3: The Forklift Operator exercised inadequate surveillance, which led to not visually identifying the Pedestrian approaching the crosswalk.
Forklift Program and Features	CON 4: Involved forklift was regularly maintained, recently serviced, and mechanical deficiencies were not a factor in the accident. CON 5: BNL did not install additional available safety features that would have provided advance warning to the Forklift Operator and the Pedestrian. CON 6: The common practice of driving to refuel instead of calling for a fuel truck resulted in the unescorted forklift driving on the roadway unnecessarily.
Traffic Safety	CON 7: BNL does not have clear lines of roles, responsibilities, authorities, and accountability for traffic safety. CON 8: BNL has not completed a traffic safety engineering analysis to evaluate roads, signage, crosswalks, and pedestrian interactions across the laboratory. CON 9: BNL culture has normalized passing slow-moving industrial vehicles across double yellow lines; this created an unsafe traffic environment. CON 10: Passive pedestrian crosswalk signage does not alert drivers to the presence of a pedestrian in a crosswalk. CON 11: BNL did not adequately identify and analyze the hazards of routine forklift roadway travel, resulting in a failure to develop and implement effective controls consistent with ISMS principles. CON 12: BHSO identified vehicle safety as a key laboratory-wide risk in 2025 but did not incorporate vehicle safety into the site office's assessment schedule.
Training	CON 13: Student safety orientation and traffic safety messaging campaigns clearly communicated lab expectations for pedestrian, bicyclist, and automobile safety in most areas, but did not address the hazard of industrial vehicles to pedestrians. CON 14: BNL supervisors and training systems failed to prevent an operator with an expired practical qualification from driving the forklift. CON 15: Online training, JPM practical training, and forklift procedures were incomplete and did not address all conditions and hazards operators would encounter. Specific gaps included on-road usage (crosswalks, horn use, restricted visibility, pedestrian right-of-way, mixed-traffic) and addressing all classes/types of forklifts.
Response	CON 16: BNL Fire Rescue provided superb initial response to the injured Pedestrian and immediately requested air medivac services, which resulted in the Pedestrian getting to the hospital within the medical "golden hour." CON 17: Bystanders made notifications and provided valuable comfort and support to the Pedestrian until emergency personnel arrived. CON 18: BNL failed to comprehensively investigate the accident and to collect several witness statements and pieces of evidence that were potentially important to understanding the accident. CON 19: BNL's status as an exclusive federal enclave makes law enforcement investigations complex, and BNL does not have effective processes and procedures for navigating this complex environment.

Judgments of Need (JONs) are the managerial controls and safety measures determined by the Board to be necessary to prevent or minimize the probability or severity of a recurrence. These JONs are linked directly to the causal factors, which are derived from the facts and analysis (see Crosswalk in Appendix H). They form the basis for corrective action plans that must be developed by line management. The Board's JONs are listed below:

- JON 1: BNL should develop a policy that minimizes the operation of forklifts on roadways.
- JON 2: BNL should evaluate and document forklift hazards and implement mitigating measures such as additional safety features and use of escort vehicles when forklift usage of the roadway is unavoidable.
- JON 3: BNL should commission an expert traffic safety review of the laboratory campus.
- JON 4: BNL should consider adding pedestrian-triggered Rectangular Rapid Flashing Beacons at the approaches to the crosswalk where the accident happened, and at the other crosswalks where there is no stop sign for vehicular traffic.
- JON 5: BNL should establish clear roles, responsibilities, authorities, and accountability for traffic safety to ensure timely implementation of recommendations from the expert traffic safety review.
- JON 6: BNL should revise its forklift training and qualification program to ensure it addresses all work activities and hazards and reflects high-quality curriculum and highly trained evaluators.
- JON 7: BNL leadership should establish a culture where line management is held accountable for procedural compliance within their organizations.
- JON 8: BNL supervisors should systematically hold employees accountable for procedural compliance.
- JON 9: BNL should develop a "Walking is Working" campaign, consistent with National Safety Council guidance.
- JON 10: BNL should improve processes for scene preservation and evidence collection to ensure effective event investigations.

7 ADDITIONAL POINTS OF INTEREST

The AIB's work focused on the July 1, 2026, accident at BNL. However, this accident represents the third instance at DOE where a forklift collision caused serious injury to a pedestrian. As such, the AIB is supplementing its report with a broader analysis of forklift hazards across the DOE complex, especially as related to forklifts striking pedestrians.

7.1 BACKGROUND ON FORKLIFT SAFETY

The hazards associated with forklifts and all powered industrial trucks vary depending on the vehicle type, classification, size, the workplace where the forklift is used, and the specific operations they are involved in. However, the commonplace hazards of forklifts include tipping over; being struck by a moving object; striking a fixed or moving object; striking a worker on foot or a pedestrian; falling from a forklift; dropping a load; being pinched or caught in between the forklift and another object, or within the parts and accessories of the forklift; and health hazard exposures such as noise, vibration, battery acid, fuels, and exhaust. The severity of these hazards includes severe injury and death to workers and non-workers in the vicinity of forklifts, as well as significant monetary costs.

From 2015 to 2024, U.S. Bureau of Labor Statistics data reflects an annual average of 73 work-related fatalities and 7,537 nonfatal days away from work incidents that were forklift related across the nation. These statistics do not include injuries and death of nonemployees, such as private users and nonemployee pedestrians, that were forklift related.

OSHA has long recognized the dangers of forklift usage, and they conduct inspections and enforcements accordingly. Seven of the 10 OSHA regions list Power Industrial Trucks as a regional emphasis program. This scrutiny from OSHA and apparent compliance difficulties in private industry have regularly resulted in the General Industry Forklift Standard ([29 CFR 1910.178](#)) annually being one of the 10 standards most frequently cited by OSHA to companies for safety violations. Specific citations often include:

- **1910.178(l)(1): Safe Operation**—Employers failing to ensure operators are competent.
- **1910.178(l)(4): Refresher Training and Evaluation**—Employers neglecting to provide required refresher training and evaluation after accidents, near misses, or observed unsafe practices.
- **1910.178(l)(6): Certification Requirements**—Employers failing to certify operators' training and evaluation.
- **1910.178(q)(7): Daily Inspections**—Employers failing to ensure daily inspections of forklifts are completed before use and allowing unsafe vehicles to remain in operation.
- **1910.178(p)(1): Unsafe Equipment Removal**—Employers not removing defective or unsafe powered industrial trucks from service until repaired.

7.2 THE HAZARD OF FORKLIFTS STRIKING PEDESTRIANS

Prior to this accident on July 1, 2026, DOE experienced two previous incidents when a forklift struck a pedestrian and caused injuries severe enough to trigger an AIB. The first occurred on May 9, 1991, at the Idaho Chemical Processing Plant, and the second occurred on July 12, 2007, at the Paducah Gaseous Diffusion Plant. The 1991 incident resulted in a fatality. The AIB reports on these two incidents identified similar root causes, including failures in line management's responsibility for safety and inadequate management systems for vehicle and pedestrian safety.

These incidents highlight the dangers of forklifts and pedestrians intermixing and make it clear that appropriate controls must be in place to protect pedestrians from forklifts and similar industrial and construction vehicles.

In 2001, the National Institute for Occupational Safety and Health (NIOSH) published an alert on preventing injuries and deaths of workers who operate or work near forklifts. Based on seven different fatalities, NIOSH concluded that the deaths could have been prevented if procedures had been followed, the appropriate safety equipment had been used, and the provisions established by OSHA standards had been followed. Specific to protecting pedestrians, NIOSH identifies safety measures including:

- Separate forklift traffic and other workers where possible.
- Make every effort to alert workers when a forklift is nearby, by using horns, audible backup alarms, and flashing lights to warn workers and other forklift operators.

Despite these risks, most forklift standards, best practices, and off-the-shelf training packages focus on warehouse settings and do not specifically address the operation of forklifts on roadways. It is important for DOE laboratories, plants, sites, and program offices to recognize this limitation and to ensure that the hazards of forklift operations on roadways are comprehensively integrated into traffic and pedestrian safety programs.

7.3 BROADER DATA ON FORKLIFT HAZARDS

The hazardous nature of forklifts is also reflected in other recent DOE events and statistics. From 2021 through August 2026, 134 forklift-related reports were documented across DOE reporting systems (Figure 11):

- Corporate Operating Experience Program (OPEX Share; Table 4),
- Occurrence Reporting and Processing System (ORPS; Figure 12),
- Computerized Accident/Incident Reporting System (CAIRS; Figure 13), and
- Noncompliance Tracking System (NTS; Table 5).

These are not necessarily 134 unique events, as some events may be reported in multiple systems. However, statistics show there has been an upward trend in the number of incidents.

Most DOE forklift events involved near misses and personnel error, highlighting the importance of human performance. Load handling hazards were the most common, followed by contact hazards, emphasizing that operational risks stem largely from routine activities (lifting, transporting, and unloading) rather than equipment failures.

The DOE data revealed that injuries were often linked to slips, trips, falls, and mounting or dismounting forklifts, rather than catastrophic failures. OPEX Share lessons reinforced the importance of proactive planning, equipment inspections, communication, and adherence to controls.

In summary, forklifts represent a significant hazard across the DOE complex. Effective work planning, operator training, equipment checks, clear communication, and reducing the exposure of forklifts to pedestrians are critical for reducing risk.

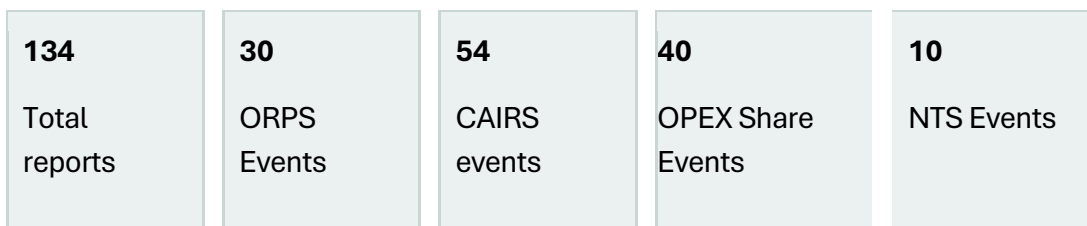


Figure 11: DOE forklift-related events from 2021 through August 2026.

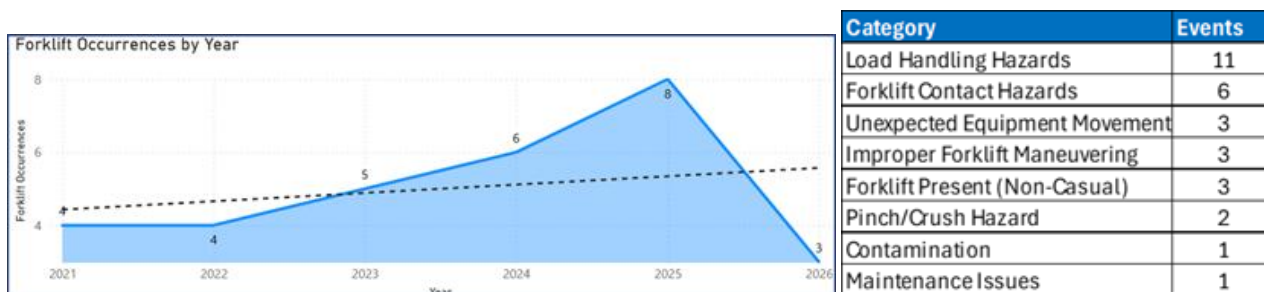


Figure 12: ORPS, 30 results (2026 totals are incomplete and should not be viewed as a decline).

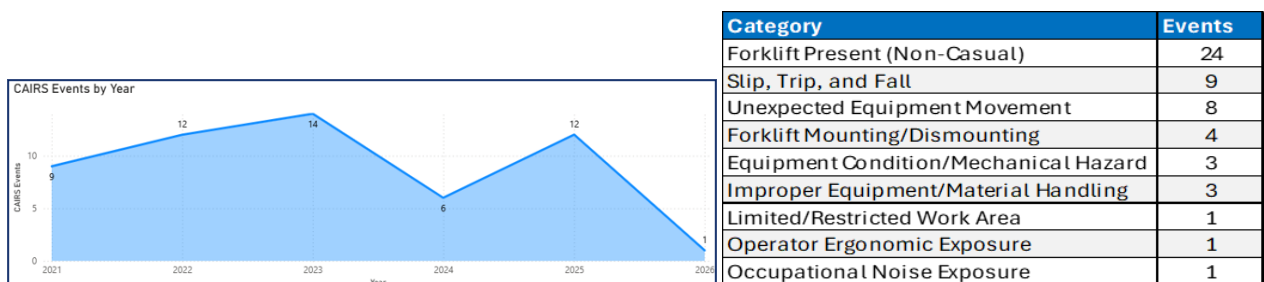


Figure 13: CAIRS, 54 results

Table 4: OPEX Share Lessons Learned, 40 Results (15 identified as directly relevant to forklift hazards and included in this table).

Site	Lesson Learned Article	Date
Los Alamos National Laboratory	ALDPS Learning Team Review 2022-00 Server Rack Fell Off Forklift While Moving	07-2026
Nevada National Security Site	Leg Entrapment During Stacking Operations	05-2026
Argonne National Laboratory	Unintended Load Slide During Forklift Placement	01-2026
Savannah River Site	Turret-Style Lift Truck Incident	01-2026
Hanford Site	Unaddressed Error Precursors Can Transform Latent Hazards Into Actual Threats	08-2025
Hanford Site	Questionable Tire Integrity Raises Doubts About Safe Work Performance	06-2025
National Laboratory of the Rockies	A Telehandler Tips Over - Pushed by Many Factors	05-2025
Hanford Site	Critical Need for Comprehensive Understanding of Forklift Types and Their Limitations	06-2024
Thomas Jefferson National Accelerator Facility	Employee Injures Back While Driving Forklift	01-2024
Idaho National Laboratory	Lapse in Effective Supervision Led to a Dropped Forklift Load	08-2023
Oak Ridge National Laboratory	Lessons Learned Resulting from Forklift Attachment Sliding Off Forks	12-2022
Hanford Site	Garbage Trucks Drivers May Be Unaware That Forks Move During Long-Haul Travel	12-2021
Pantex Plant	Heavy Equipment Operator Injured While Moving Pallets	08-2021
Pacific Northwest National Laboratory	Work Planning and Control Missed After Scope Change	07-2021
Pacific Northwest National Laboratory	Forklift Accidently Tips Over 3000+ Pound Drum	04-2021

Table 5: NTS, 10 Results.

Site	Noncompliance Title	Date
National Laboratory of the Rockies	Steel Worker Injured Spotting for Forklift	12-2025
Hanford Site	Management Concern for Forklift Contact with Scaffold at ETF	12-2025
Pantex Plant	DSA Noncompliance - Forklift Maintenance Issue	07-2025
National Laboratory of the Rockies	EMAPS Telehandler Forklift Tip Over and Spill	05-2025
Hanford Site	Near Miss - Worker Contacted with Forklift Tines	07-2024
Hanford Site	Forklift Falls from Trailer and Injures Worker	07-2023
Y-12 National Security Complex	Utility Terrain Vehicle Struck by Forklift	04-2023
Idaho National Laboratory	Forklift Inadvertently Striking of Charger Cable	02-2023
Oak Ridge National Laboratory	Forklift Attachment Slides Off Forks	04-2022
Fermi National Accelerator Laboratory	Forklift Fork Slides Off Carriage onto Employee's Foot	05-2021

8 BOARD SIGNATURES

Approved by:

**Jessica
Halse**

Digitally signed by Jessica
Halse
Date: 2026.10.07
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Jessica Halse, Chair
Associate Deputy Director for Operations
Office of Science, Department of Energy

**JEFFREY
BARTINE**

Digitally signed by
JEFFREY BARTINE
Date: 2026.10.07
14:16:33 -05'00'

Jeff Bartine
Environmental, Safety and Health Program Manager, Ames Site Office
Office of Science, Department of Energy

**ROBERT
PLONSKI**

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ROBERT PLONSKI
Date: 2026.10.07
15:27:34 -06'00'

Rob Plonski
Deputy Director of the Safety Engineering Division
Accident Investigation Program Sponsor
National Nuclear Security Administration

**MAX
POSTMAN**

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POSTMAN
Date: 2026.10.07
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Max Postman
Deputy Director, Office of Safety and Security
Office of Science, Department of Energy

**TERESA
ROBBINS**

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TERESA ROBBINS
Date: 2026.10.07
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Teresa Robbins
Deputy Manager, Oak Ridge Office of Environmental Management
Office of Environmental Management, Department of Energy

**JOANNA
SERRA**

Digitally signed by
JOANNA SERRA
Date: 2026.10.07
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Joanna Serra
Central Technical Authority
Office of Science, Department of Energy

**STEPHEN
TERPENING**

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STEPHEN TERPENING
Date: 2026.10.07
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Stephen Terpening
Facility Representative, Argonne Site Office
Office of Science, Department of Energy

9 APPENDIX A: BOARD LETTERS OF APPOINTMENT



Department of Energy
Office of Science
Washington, DC 20585

July 4, 2026

MEMORANDUM FOR JESSICA HALSE
ASSOCIATE DEPUTY DIRECTOR FOR OPERATIONS
OFFICE OF SCIENCE

FROM: JUSTON FONTAINE *Juston Fontaine*
DEPUTY DIRECTOR FOR OPERATIONS
OFFICE OF SCIENCE

SUBJECT: Charge for Accident Investigation at Brookhaven National Laboratory

BACKGROUND: On July 1, 2026, an individual was struck by a forklift at Brookhaven National Laboratory (BNL). Initial information indicates that the individual suffered a significant leg injury. Brookhaven Science Associates (BSA), the management and operating contractor for BNL, is currently conducting an internal fact-finding analysis.

ACTION: In order to determine the facts and circumstances related to the incident as well as any contributing factors, I am directing that an investigation be conducted to identify causal factors, including a review of any relevant policies, procedures, work practices, or actions related to the incident. This review should include, but is not limited to the following:

1. Determine the facts leading up to the incident.
2. Review the adequacy of the immediate response, actions, and any interim modifications made in response to this incident.
3. Assess the application of relevant safety programs and processes, to include training, planning of hazards, oversight, and safety measures.
4. Conduct a causal analysis, using recognized methodologies to determine the root and contributing causes of the incident that led to the injury.
5. Evaluate whether broader systemic weaknesses were present.

CHARGE: Given the seriousness of the event and the injuries sustained to the individual, as well as the likelihood that the incident may result in the criteria of DOE O 225.1B, Appendix A, item 2.a.(2) (any single accident that results in the hospitalization for more than five calendar days, commencing within seven calendar days of the accident, of one or more DOE, contractor, or subcontractor employees or members of the public due to a serious personal injury or acute chemical or biological exposure), I am formally appointing an Accident Investigation Board (AIB).

You are appointed as the Board Chairperson and are to conduct this investigation in accordance with DOE O 225.1B. In this capacity, you are to lead a DOE investigation team comprised of Federal employees to investigate the incident. This initial memorandum will be followed by subsequent charge, which formally identifies the AIB members, including a qualified accident investigator.

Please provide a draft report no later than August 20, 2026, which includes findings, causal analysis, and recommendations aimed at identifying and correcting any deficiencies that contributed to the incident as well as any broader programmatic weaknesses or lessons learned that would improve future activities. If, during the course of the review, specific critical items of an urgent nature are identified, please address these issues immediately and provide a summary of findings.

cc:

Matthew Barger, Brookhaven Site Office Manager

Clay Messer, Director, Office of Environment, Health, Safety and Security



Department of Energy
Office of Science
Washington, DC 20585

July 6, 2026

MEMORANDUM FOR JESSICA HALSE
ASSOCIATE DEPUTY DIRECTOR FOR OPERATIONS
OFFICE OF SCIENCE

FROM: JUSTON FONTAINE *Juston Fontaine*
DEPUTY DIRECTOR FOR OPERATIONS
OFFICE OF SCIENCE

SUBJECT: Amended Charge for Accident Investigation at Brookhaven National Laboratory

On July 4, 2026, the attached memorandum was issued to establish a DOE investigation team to investigate the circumstances of an individual struck by a forklift at Brookhaven National Laboratory (BNL) on July 1, 2026.

At that time, although the incident had not yet met the determination criteria for a formal accident investigation, given the seriousness of the event and the injuries sustained to the individual, the July 4, 2026, memorandum appointed you as the Accident Investigation Board (AIB) Chairperson for an accident investigation to be conducted in accordance with DOE O 225.1B. Subsequent to the issuance of the initial charge, the incident now meets the criteria of DOE O 225.1B, Appendix A, item 2.a.(2) (any single accident that results in the hospitalization for more than five calendar days, commencing within seven calendar days of the accident, of one or more DOE, contractor, or subcontractor employees or members of the public due to a serious personal injury or acute chemical or biological exposure).

You are appointed as the Board Chairperson and are to conduct this investigation in accordance with DOE O 225.1B. The AIB will be composed of the following additional members:

- Joanna Serra, Office of Science
- Teresa Robbins, Office of Environmental Management
- Robert Plonski, National Nuclear Security Administration – Trained Accident Investigator
- Stephen Terpening, Office of Science
- Max Postman, Office of Science
- Jeff Bartine, Office of Science

You may utilize additional expertise as you deem necessary to ensure appropriate investigation of this incident.

The action and charge as communicated in the July 4, 2026, memorandum remain the same for this appointed AIB.

Attachment

cc:

Joanna Serra, Office of Science
Teresa Robbins, Office of Environmental Management
Robert Plonski, National Nuclear Security Administration
Stephen Terpening, Office of Science
Max Postman, Office of Science
Jeff Bartine, Office of Science

10 APPENDIX B: ORPS REPORTS

Below is a copy of the ORPS report for this incident, with personal information redacted.

SC-HQ-BHSO-BNL-CAD-2026-0003

NOTIFICATION

Occurrence Report

After 2017 Redesign

Collider-Accelerator Department

(Name of Facility)

Accelerators

(Facility Function)

Brookhaven National Laboratory

Brookhaven National Laboratory

(Site)

(Contractor)

Name: Abhay Deshpande

Telephone No.: [REDACTED]

(Facility Manager/Designee)

Name: HAMILTON, CLAYTON CRAIG

Telephone No.: [REDACTED]

(Originator/Transmitter)

Name:

Date:

(Authorized Classifier (AC))

Occurrence Report Number: SC-HQ-BHSO-BNL-CAD-2026-0003

Injury Involving Forklift on Site Roadway

Report Type and Date: NOTIFICATION

	Date	Time
Notification:	07/08/2026	13:58 (ETZ)
Initial Update:		(ETZ)
Latest Update:		(ETZ)
Final:		(ETZ)

Report Level: H

Division or Project: Collider Accelerator
Department

Secretarial Office: SC - Science

System, Bldg., or Equipment: Roadway -
Outdoors

CUI?: No

Reviewed for Public Release:

Plant Area: Roadway

Date and Time

Date and Time

Discovered: 07/01/2026 09:32 (ETZ)

Categorized: 07/01/2026 10:15 (ETZ)

DOE HQ OC Notification:

Date	Time	Person Notified	Organization
07/01/2026	10:23 (ETZ)	DOE Watch	DOE
07/01/2026	09:37 (ETZ)	M. Barger	DOE/BHSO

Other Notifications:

Date	Time	Person Notified	Organization
07/01/2026	09:35 (ETZ)	A. Emrick	BNL
07/01/2026	09:50 (ETZ)	A. Perez	BNL
07/01/2026	10:15 (ETZ)	C. Hamilton	BNL
07/01/2026	09:35 (ETZ)	T. Daniels	BNL

Subject or Title of Occurrence: Injury Involving Forklift on Site Roadway

Reporting Criteria:

2A(3) - Any single occurrence, injury, or exposure resulting in an occupational injury that requires in-patient hospitalization for five or more days, commencing within seven days from the date the injury.

Description of Occurrence:

On 07/01/2026 at 09:32 a.m. BNL Emergency Services received notification from the Suffolk County Fire Rescue and Emergency Services after a 911 call reporting a motor vehicle incident at the crosswalk located at Mitchell Lane and Upton Road on the BNL site. Emergency Services responded and determined that a forklift returning to the C-AD complex on the BNL site after refueling had struck a [REDACTED] pedestrian in the crosswalk. This event was categorized as a ORPS Low on 7/01/2026 and was subsequently raised to ORPS High 7/06/2026 after further event information was obtained.

Is Subcontractor Involved? No

Immediate Actions Taken and Results: Emergency Services responded immediately following the notification and initiated medical treatment for the injured pedestrian. Laboratory Protection secured the scene and provided traffic control. Suffolk County Medivac subsequently transported the patient to a local hospital for further evaluation and treatment. Laboratory Protection performed their initial investigation and turned the scene over to Safety and Health Services Division for initial fact-finding.

ISM:

- 2) Analyze the Hazards
- 3) Develop and Implement Hazard Controls

5) Provide Feedback and Continuous Improvement

Cause Code(s):

Description of Cause:

Causal and DOE Accident Investigation Board Investigation is underway information will be submitted in the ORPS Final Report.

Corrective Actions

(* = Date added/revised since final report was approved.)

Lessons Learned:

Will be published to DOE OPEXShare when more information is known.

Similar Occurrence Report Numbers:

N/A

HQ Keyword(s):

08D--OSHA Reportable/Industrial Hygiene - Injury
12H--EH Categories - Injuries Requiring Medical Treatment Other Than First Aid
14L--Quality Assurance - No QA Deficiency

HQ Summary:

On July 1, 2026, Brookhaven National Laboratory (BNL) Emergency Services received notification from the Suffolk County Fire Rescue and Emergency Services after a 911 call reporting a motor vehicle incident at the crosswalk located at Mitchell Lane and Upton Road on the BNL site. Emergency Services responded and determined that a forklift returning to the C-AD complex on the BNL site after refueling had struck a [REDACTED] pedestrian in the crosswalk. This event was categorized as a Occurrence Reporting and Processing System (ORPS) Low-Level report and was subsequently raised to ORPS High-Level report after further event information was obtained.

Facility Representative or Designated DOE Representative:

Uploaded Documents:

No Files Found

Updated Report Information:

11 APPENDIX C: SUMMARY LIST OF EVIDENCE

11.1 OVERVIEW

This section summarizes the evidence that the AIB collected and used to develop this report. This includes 38 interviews, over 500 documents, and multiple on-site visits and observations.

11.2 INTERVIEWS

The AIB conducted interviews with the individuals listed below. Individuals were recorded, subject to approval from the person being interviewed.

Individuals involved in accident, witnesses, and bystanders:

- Forklift Operator,
- Pedestrian,
- Driver of vehicle immediately behind forklift at time of accident (Driver 4),
- Driver of vehicle one car behind forklift at time of accident (Driver 5),
- Driver of vehicle two cars behind forklift at time of accident (Driver 6), and
- Individuals who heard Pedestrian screaming and went to scene of accident (Bystanders 1, 2, and 3).

Individuals involved in response to accident:

- BNL Fire Chief,
- Other BNL Fire Rescue personnel involved in response,
- BNL Police Chief,
- Other BNL Police Department personnel involved in response,
- BNL Laboratory Protection Division manager,
- BNL Emergency Response Coordinator, and
- FBI Supervisory Special Agent.

Other BNL personnel:

- Laboratory Director;
- Chief Operating Officer;
- General Counsel;
- Associate Laboratory Director (ALD) for Facilities and Operations;
- Facilities and Operations Training Manager;
- ES&H Program Leads for traffic, pedestrian safety, and power industrial trucks;
- ES&H Manager for Forklift Group;
- Forklift safety subject matter expert;
- Work Control Manager in Collider-Accelerator Division;
- Manager of Quality Management Office;
- Training managers;
- Four additional forklift operators;

- Pedestrian's BNL mentor; and
- Chief Medical Officer and Director of Occupational Medicine.

DOE BHSO personnel:

- Site Office Manager,
- Deputy Site Office Manager, and
- Site Office staff responsible for safety and emergency response.

11.3 VISITS AND OBSERVATIONS

The AIB conducted the following in-person visits and observations:

- Visit to accident site,
- Visit to Heavy Equipment Maintenance and Operation shop where forklift was stored after the accident,
- Observation of BNL forklift operator practical examination,
- Observation of plan-of-day meeting for Forklift Operator's working group,
- Visit to forklift staging area and practical examination areas,
- Post-accident forklift operation evaluation (i.e., annual inspection and brake testing), and
- Re-creation of accident.

11.4 DOCUMENTS

The AIB collected and reviewed the following documents.

Documents directly related to the accident:

- BNL ES&H Directorate fact-finding report;
- BNL Police Department incident report and tour report;
- BNL Fire Rescue incident report and prehospital care report;
- Notifications to DOE Watch Office;
- Written statements that BNL Police Department took from Forklift Operator, Pedestrian, Driver 4, and Bystanders 1 and 2;
- Photos and text messages sent after the accident by an occupant of housing near the accident scene;
- Photos taken by BNL emergency response personnel at accident scene;
- Call logs from Forklift Operator and individuals involved in accident response;
- Forklift Operator's driver's license;
- Records of Forklift Operator alcohol and drug tests conducted by Occupational Medicine after the accident; and
- Approval by Occupational Medicine Department for Forklift Operator to return to work following accident.

BNL policies, procedures, and MOUs:

- Forklift operations and safety,
- Worker safety and health,
- Traffic safety,
- Security,
- Emergency operations,
- Discipline,
- Return to work,
- Injury and illness investigation,
- Events and issues management,
- Work planning and control,
- CAS, and
- MOUs with local law enforcement agencies.

Training information:

- Training records for Pedestrian,
- Training records for Forklift Operator,
- List of required trainings for forklift operators,
- Content of online training for forklift operators,
- Content of training Pedestrian received as part of internship program,
- Content of practical examination for forklift operators,
- Status of training completion for forklift operators across the laboratory,
- E-mails reporting overdue required trainings,
- Requirements for evaluators of forklift practical examinations, and
- Example of written evaluation of a forklift operator's performance during a practical examination.

Forklift and work order information:

- Forklift maintenance and inspection records,
- Asset information for forklift involved in accident,
- Forklift refueling records,
- Record of pre-use inspections by operators on forklift involved in accident, and
- Work order for task Forklift Operator was performing prior to accident

Records of incidents and reported employee concerns:

- Safety incident reports, including incidents involving students;
- Lessons learned from safety incidents;
- Traffic safety enforcement records;
- Employee concerns submitted to BNL ES&H Directorate; and
- Employee concerns submitted to BNL Traffic Safety Committee.

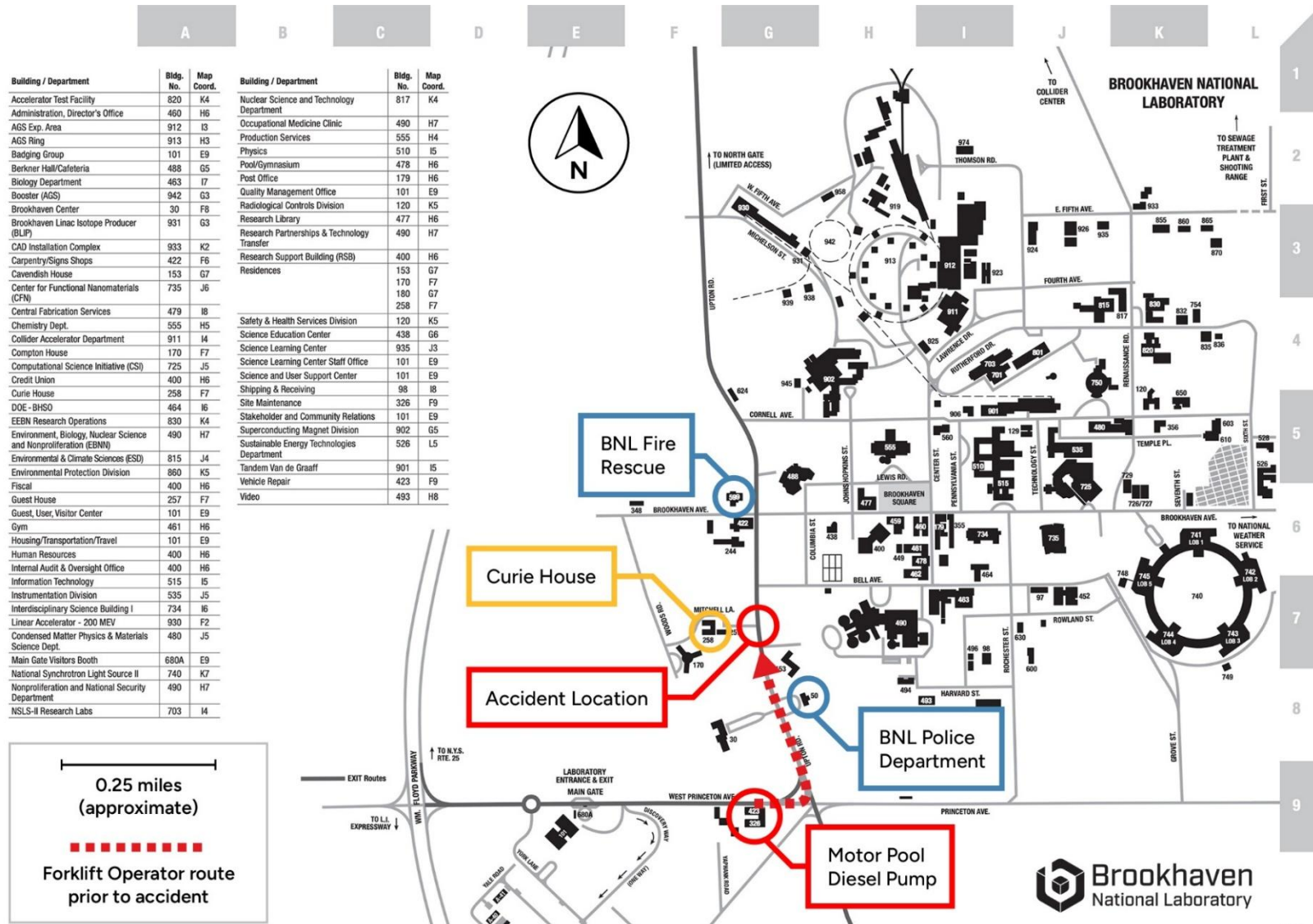
BHSO documents:

- Responsibilities matrix;
- Integrated assessment schedule;
- Risk registry;
- Oversight plan;
- Laboratory performance evaluations; and
- Samples of assessments, surveillances, and associated records.

Other documents:

- Assessments of BNL's forklift safety, lifting safety, traffic safety, and CAS, as well as associated entries into Issues Management System;
- OSHA regulations and ANSI standards; and
- Records of safety-related laboratory communications before and after the accident.

12 APPENDIX D: DETAILED LABORATORY MAP



05/25

13 APPENDIX E: BARRIER ANALYSIS

Organizational, Culture, and People (OCP) Barriers

#	Barrier	Performance of Barrier	Why did Barrier Fail?	Accident Effect	Human Performance Error Precursor	Integrated Safety Management (ISM)
B.OCP1	Work Planning and Control	Less than Adequate	No work planning and control documentation was identified for forklift road use and/or refueling. This was a worker-planned activity.	Adequate work planning and control would identify the task (forklift road use and/or refueling), hazards (vehicle, bicycle, and pedestrian traffic), and controls to mitigate the identified hazards/risk.	Unclear standards: complacency/overconfidence: inaccurate risk perceptions.	Define the scope of work; analyze the hazards; develop and implement hazard controls; perform work within controls; provide feedback and continuous improvement.
B.OCP2	Integration of Forklift Program with Roadway and Traffic Safety	Less than Adequate	No evaluation of whether forklifts and routes were collectively suitable for mixed roadway use.	Allowed routine use of forklifts on roads that introduced hazards not fully evaluated and controlled.	Habit patterns: complacency/overconfidence: inaccurate risk perceptions: unclear goals: roles or responsibilities: unclear standards.	Define the scope of work; analyze the hazards; develop and implement hazard controls; perform work within controls; provide feedback and continuous improvement.
B.OCP3	Requirement that only trained operators operate forklifts	Less than Adequate	Operator did not recognize/communicate expired training, despite receiving repeated BTMS notifications. Operator operated forklift with expired qualifications. Supervisor did not verify training prior to assigning work.	Forklift operator was allowed to drive the forklift with expired practical qualification	Complacency/overconfidence: mental shortcuts or biases: imprecise communication habits: unsafe attitudes: unclear goals: roles or responsibilities.	Perform work within controls; provide feedback and continuous improvement.
B.OCP4	Supervision/ Oversight of Forklift Operator	Less than Adequate	Supervisor did not recognize training was expired, despite BTMS notifications. Review of qualifications was not routine. Expectations for proactively calling for a fuel truck were not set. Did not verify that forklift was inspected prior to use. Did not drive rigorous forklift program requirement adherence.	Allowed an unqualified forklift operator to operate a forklift; Allowed the use of a potentially unchecked/unsafe forklift during operations; Allowed more frequent road use than necessary.	Unsafe attitudes: complacency/overconfidence: inaccurate risk perceptions.	Define the scope of work; analyze the hazards; develop and implement hazard controls; perform work within controls.
B.OCP5	Use of Fuel Truck	Less than Adequate	Forklift operator did not call for a fuel truck before driving to refueling station. Assumption that fuel truck would not be available and delivery would take too long.	Forklift traveled on roads to refuel.	Unclear standards: assumptions: inaccurate risk perceptions.	Analyze the hazards; develop and implement hazard controls.
B.OCP6	Pedestrian decision to enter the crosswalk	Less than Adequate	Pedestrian made assumptions that the Forklift Operator could see them and could stop in time. Distracted by phone usage.	Pedestrian entered the crosswalk and was struck by forklift.	Time pressure: simultaneous: multiple actions: distractions/interruptions: complacency/overconfidence: inaccurate risk perceptions.	N/A

Forklift Program and Feature (FPF) Barriers

#	Barrier	Performance of Barrier	Why did Barrier Fail?	Accident Effect	Human Performance Error Precursor	ISM
B.FPF1	Pre-Use Checklist	Less than Adequate	The pre-use checklist does not capture hours of use; inspection order of operation is not aligned with logical completion steps; not fully completed every time; no date of revision or site form number; cannot document deficiencies of machine.	Reduced assurance that a forklift was in good mechanical condition for safe use.	Habit patterns, mental shortcuts or biases, repetitive actions, unclear goals, roles or responsibilities, unsafe attitudes.	Analyze the hazards; develop and implement hazard controls.
B.FPF2	Forklift Dispatch Process	Missing	BNL has no formal process to dispatch forklifts. BTMS is not integrated with key control, equipment dispatch, digital access, or supervisor authorization.	Allowed a forklift operator whose training had expired to operate a forklift. Allowed operators to take forklifts off the yard without pre-use inspections.	Mental shortcuts or biases, lack of alternative indication.	Develop and implement hazard controls; operations authorization.
B.FPF3	No Forklift Standard Intersection/ Crossing Approach Protocol	Missing	BNL forklift training did not teach a standardized sequence for approaching crosswalks which could have included early speed reduction, brake coverage, horn warning, left-right scan, pedestrian-clearance confirmation, and stopping.	The crossing depended on individual vigilance rather than a repeatable defensive operating procedural barrier.	Distractions/interruptions, inaccurate risk perceptions, mental shortcuts or biases, unclear standards.	Analyze the hazards; develop and implement hazard controls; perform work within controls.
B.FPF4	Operator Visibility	Less than Adequate	Left mast of forklift obscured the operator's line of sight.	Limited visibility impeded detection of a pedestrian in the crosswalk.	Assumptions, inaccurate risk perceptions, lack of alternative indication.	Analyze the hazards; develop and implement hazard controls; provide feedback and continuous improvement.

#	Barrier	Performance of Barrier	Why did Barrier Fail?	Accident Effect	Human Performance Error Precursor	ISM
B.FPF5	Additional Safety Features	Missing	Additional safety features were not present on this forklift, to include pre-use inspection ignition interlock system; warning, directional and safety lights; enhanced frontal visibility cameras; proximity sensors; audible alerts; automatic braking; dynamic speed control; and presence detection systems.	The operator did not recognize Pedestrian, and Pedestrian did not recognize the imminent danger of the oncoming forklift.	Distractions/interruptions, simultaneous, multiple actions, lack of alternative indication.	Analyze the hazards; develop and implement hazard controls.
B.FPF6	Brake Stopping Capability	Functioned; But Did Not Prevent Accident	The brake system remained dependent on timely pedestrian recognition, operator reaction, effective pedal application, available friction, and adequate stopping distance.	Forklift brakes were not used until after the Pedestrian was struck.	Distractions/interruptions, inaccurate risk perceptions, hidden system/faulty mental model.	Analyze the hazards; develop and implement hazard controls; provide feedback and continuous improvement.

Traffic Safety (TS) Barriers

#	Barrier	Performance of Barrier	Why did Barrier Fail?	Accident Effect	Human Performance Error Precursor	ISM
B.TS1	Clear Roles, Responsibility, and Accountability for Traffic Safety	Less than Adequate	BNL did not fully identify or resolve issues related to traffic safety on site.	High-risk areas (specifically mixed-use roadways that include vehicle, bicycle, and pedestrian traffic as well as slow-moving vehicles) were not identified and addressed by the laboratory.	Complacency/overconfidence, interpretation of requirements, unclear goals, roles or responsibilities.	Define the scope of work; analyze the hazards; develop and implement hazard controls; perform work within controls; provide feedback and continuous improvement.
B.TS2	Traffic Safety (Program/ Subject Area)	Less than Adequate	Traffic safety program did not address slow moving vehicles/equipment and pedestrian interactions. Traffic safety did not address passing of slow-moving vehicles/equipment.	Pedestrian and forklift were in same area; slow moving vehicles are passed regularly, even in no passing areas;	N/A	Develop and implement hazard controls.
B.TS3	BNL Pedestrian Safety Messaging	Minimally Effective	Although BNL training covers pedestrian safety, BNL does not have a “walking is working” campaign that sets a clear prohibition on walking while looking at phone or with earbuds.	Opportunity for improvement to expand pedestrian safety messaging.	Unclear standards, habit patterns.	N/A
B.TS4	Formal Engineering Determination of Roadway Suitability	Missing	Routine transit was treated as an ordinary extension of worker planned forklift operations rather than a separate hazard analysis requiring review of lane width, shoulder, grade, surface, sight distance, visibility, pedestrian exposure, sidewalks, signage, and vehicle interaction.	Allowed forklift road use without demonstrating that the equipment, route, and operating controls collectively provided adequate protection for pedestrians and other road users.	Lack of knowledge/faulty mental model, assumptions, complacency/overconfidence, inaccurate risk perceptions.	Define the scope of work; analyze the hazards; develop and implement hazard controls; operations authorization.
B.TS5	Refueling Location and Logistics Risk Review	Missing	The refueling approach was not designed to minimize the presence of forklifts on mixed-use laboratory roads.	A centralized refueling arrangement continued to generate repeated forklift travel on mixed-use roads without showing that the location and logistics minimized risk.	Lack of knowledge/faulty mental model, assumptions, inaccurate risk perceptions, unsafe attitudes, repetitive actions.	Analyze the hazards; develop and implement hazard controls; provide feedback and continuous improvement.
B.TS6	Lead or Escort Vehicle Trigger by Forklift Configuration or Route	Missing	No criteria required an escort to control passing, warn pedestrians, clear limited-sight crossings, or provide advance notice when a forklift traveled through mixed-use areas.	There was no escort vehicle ahead of the forklift to verify the crosswalk was clear, warn the Pedestrian, or prevent passenger vehicles from creating a distraction by passing.	Distractions/interruptions, simultaneous, multiple actions, unclear goals, roles or responsibilities, lack of alternative indication.	Analyze the hazards; develop and implement hazard controls; perform work within controls.

#	Barrier	Performance of Barrier	Why did Barrier Fail?	Accident Effect	Human Performance Error Precursor	ISM
B.TS7	Designated slow-moving vehicle/forklift routes	Missing	No routes were analyzed (beyond identification of graded roads)	Allowed forklifts to operate alongside vehicle, bicycle and pedestrian traffic.	Complacency/overconfidence, inaccurate risk perceptions, unclear standards.	Analyze the hazards; develop and implement hazard controls; perform work within controls.
B.TS8	Double Yellow Line	Less than Adequate	Vehicles did not adhere to New York State Law to not pass vehicles in a no-passing area.	Vehicles passing the forklift, increasing distractions.	Time pressure, simultaneous, multiple actions, distractions/interruptions, unsafe attitudes, assumptions, inaccurate risk perceptions.	Develop and implement hazard controls; perform work within controls.
B.TS9	Crosswalk Signage	Less than Adequate	Drivers become inured to flashing lights due to regular exposure; does not indicate when a pedestrian is in the crosswalk	Crosswalk signage did not provide the Forklift Operator with a positive indication a pedestrian was in the crosswalk.	Habit patterns, complacency/overconfidence, inaccurate risk perceptions.	N/A

Training (Tn) Barriers

#	Barrier	Performance of Barrier	Why did Barrier Fail?	Accident Effect	Human Performance Error Precursor	ISM
B.Tn1	Escalation of Unresolved or Expired Qualifications to Management	Missing	Repeated BTMS notices remained at the supervisor/forklift operator level with no threshold identified for escalation to division management, ES&H management or the issues management system.	Allowed a forklift operator whose training had expired to operate a forklift.	Complacency/ overconfidence, lack of alternative indication, unclear standards.	Provide feedback and continuous improvement; line management responsibility for safety.
B.Tn2	Online Training Course for Forklift Operators	Less than Adequate	Did not address all operations or conditions that operators are expected to perform. No revision or update in 20 years. Exam was not challenging or comprehensive, limited to 10 multiple-choice questions. BNL online training was less rigorous than industry options. Operator responsibilities not emphasized.	Antiquated training (20+ years) created an atmosphere of complacency; site hazards and industry standards have changed, and training has not been revised.	Complacency/ overconfidence, unclear standards.	Provide feedback and continuous improvement.
B.Tn3	Evaluator Qualifications	Less than Adequate	No required/formal evaluator training and retraining. No evaluator consistency across divisions.	Missed opportunity to ensure rigor and consistency in practical exams.	Interpretation of requirements, unclear goals, roles or responsibilities.	Perform work within controls; provide feedback and continuous improvement.
B.Tn4	Practical Training and Qualification	Less than Adequate	On-site practical training and qualification are less rigorous than industry options and do not fully evaluate the full operator expected scope. Training does not require operators to demonstrate proficiency on multiple equipment types or lifting capacity, attachments, visibility limitations, and road-use configuration. No minimum standard for training hours prior to qualification.	Allowed forklift operators to obtain qualification without comprehensive training. Specifically, forklift operators were not trained or evaluated for road use driving.	Assumptions, complacency/ overconfidence, inaccurate risk perceptions, unclear goals, roles or responsibilities, unclear standards.	Analyze the hazards; develop and implement hazard controls; perform work within controls; provide feedback and continuous improvement.

Response (R) Barriers

#	Barrier	Performance of Barrier	Why did Barrier Fail?	Accident Effect	Human Performance Error Precursor	ISM
B.R1	Dialing BNL Internal Emergency Number (x2222)	Less than Adequate	Personnel tried calling from personal phones and did not remember or have the full 10-digit number stored in their phone.	Delayed emergency response 1–2 minutes.	Habit patterns, inexperience/lack of proficiency.	Perform work within controls; provide feedback and continuous improvement.
B.R2	Dialing of 9-1-1, External Emergency Response	Effective	N/A	Effectively deployed BNL emergency response to scene	N/A	Perform work within controls.
B.R3	Appropriate Bystander Response	Effective	N/A	Provided aid and comfort to the injured Pedestrian and stopped the Pedestrian from standing up.	N/A	N/A
B.R4	Forklift Operator Response	Less than Adequate	Forklift Operator called supervisor before calling emergency services. Most likely in shock and was trained to call supervisor first.	Backing up and lifting forks helped preserve scene and provide additional access to Pedestrian care. Called their supervisor immediately. Attempted to call BNL Internal Emergency Number (x2222) 2 minutes after the accident.	Simultaneous, multiple actions, stress.	Perform work within controls.
B.R5	BNL Fire Rescue	Superb	N/A	Injured Pedestrian arrived at hospital within 1 hour.	N/A	N/A
B.R6	BNL Police Department – Initial Response	Effective	N/A	Controlled traffic and kept road safe, which enabled the BNL Fire Rescue to move the Pedestrian to helipad.	N/A	N/A
B.R7	BNL Police Department - Event Investigation	Less than Adequate	Limited staff and large scene. Appropriately prioritized scene control over witnesses and scene preservation for investigation. Lack of clarity on event investigation roles and responsibilities with local county police department and FBI.	Enabled safe egress for Pedestrian; lost two witnesses; lost dash-cam footage from one vehicle and insufficient photos of scene.	Simultaneous, multiple actions, unclear goals, roles or responsibilities, assumptions.	Define the scope of work.
B.R8	Emergency Notifications (SC Headquarters, SC Site Office, Watch Office, etc.)	Effective	Other notifications were effective.	Relevant organizations were promptly notified.	N/A	N/A

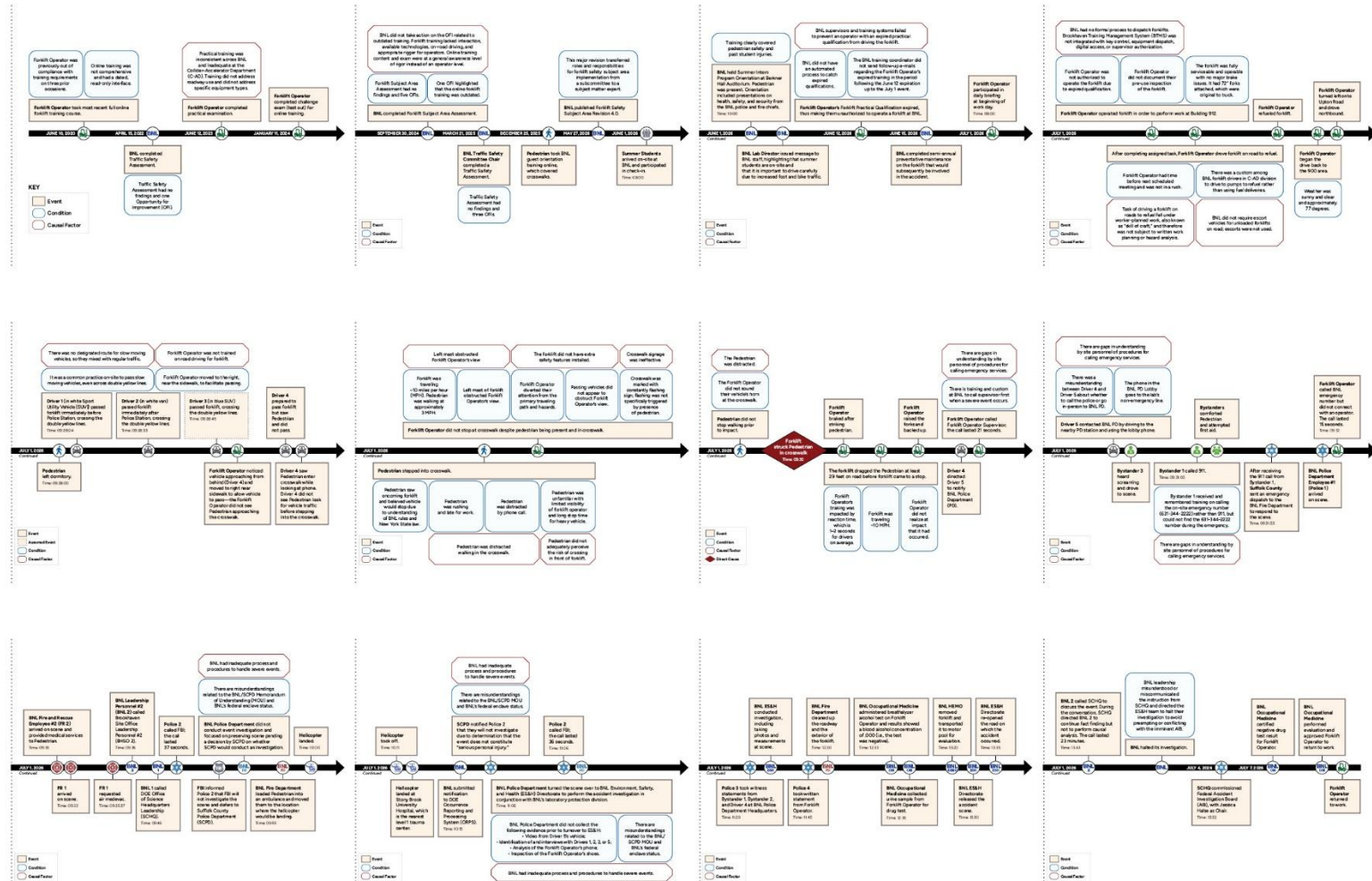
14 APPENDIX F: CHANGE ANALYSES

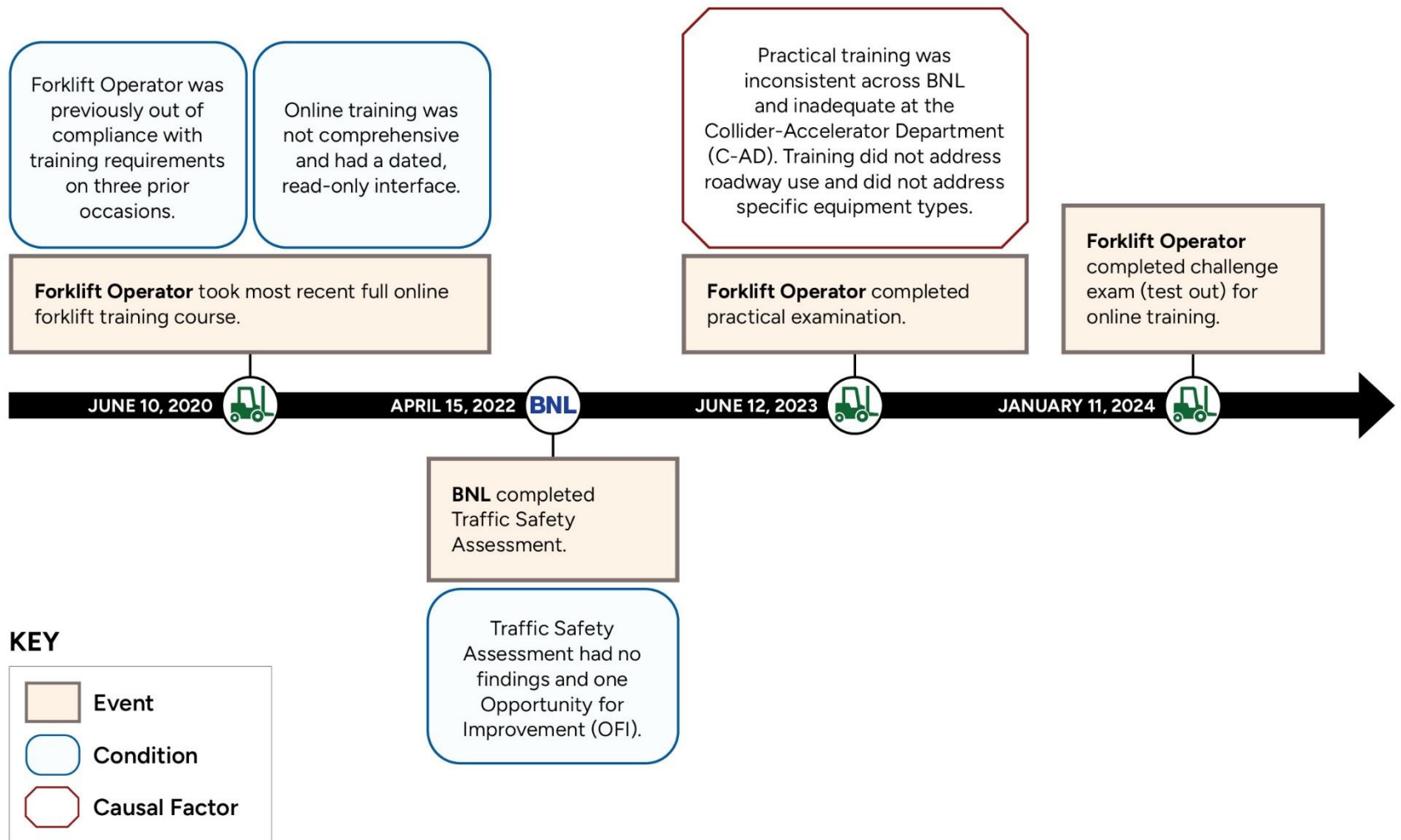
Factors	Accident Situation	Prior, Ideal or Accident-Free Situation	Difference	Evaluation of the Effect
What Happened (e.g., Events, Conditions, Activities, Equipment)	Forklift was on a BNL road without an escort.	Forklift would be escorted on a BNL road.	Escort would have warned the Forklift Operator of the pedestrian hazard.	Significantly reduces the likelihood of the Pedestrian being struck.
	No additional safety features (e.g., cameras, object presence detection system, etc.) were installed on the forklift.	Additional safety features would be installed on the forklift.	Safety features would have increased the Forklift Operator's awareness of the Pedestrian in the crosswalk.	Reduces the likelihood of the Pedestrian being struck.
	Multiple cars pass or prepare to pass slow-moving forklift over double yellow line.	Cars would not pass or attempt to pass the slow-moving forklift over double yellow.	Avoids cars moving in opposite directions in the same lane and reduces risk that operator will exercise inadequate surveillance of crosswalk due to time spent monitoring passing cars.	Reduces the likelihood of the event.
	Crosswalk sign blinks constantly and does not provide indication of when a pedestrian is in crosswalk.	Crosswalk sign would only flash when pedestrian is crossing.	Reduces sign blindness and increases likelihood of drivers stopping for pedestrians.	Reduces the likelihood of the event.
When it Happened	N/A	N/A	N/A	N/A
Where It Happened (e.g., Physical Location, Environmental Conditions)	Pedestrian in crosswalk that is partially obscured by rise in road and has faded striping.	Crosswalk would be clearly visible to drivers.	Increased likelihood of drivers stopping for pedestrians.	Possibly would reduce likelihood of event.
Who Was Involved (e.g., Staff Involved, Planning, Training, Qualification, Performance and Supervision)	Forklift Operator drove the forklift with expired practical qualification.	Forklift Operator would be fully qualified to drive the forklift on the day of the event.	Forklift Operator would have followed site and OSHA qualification requirements.	It is unlikely to have changed the outcome as other elements failed.
	Forklift operator diverted their attention from the primary traveling path and hazards.	Forklift operator would perform adequate driving surveillance to detect hazards.	Forklift operator sees the approaching Pedestrian.	Significantly reduces the likelihood of the event.
	Forklift operator did not slow down or use forklift horn when approaching the crosswalk.	Forklift operator would approach the crosswalk as taught in the online training.	Slower speed and horn would provide additional opportunity for both Forklift Operator and Pedestrian to take steps to avert collision.	Reduces the likelihood of the event.
	Pedestrian enters crosswalk when oncoming forklift and vehicles are visible.	Pedestrian would wait for forklift and other vehicles to pass or make eye contact with Forklift Operator prior to entering the crosswalk.	Both Pedestrian and Forklift Operator see each other.	Eliminates event.
	Pedestrian distracted when entering crosswalk.	Pedestrian would be focused solely on walking and crossing the street.	Pedestrian is more likely to stop or evade impact.	Significantly reduces the likelihood of event.
	Forklift Operator initially called supervisor rather than emergency services.	Forklift Operator and others at scene would immediately call on-site	Delayed first responders by 1–2 minutes.	Minimal

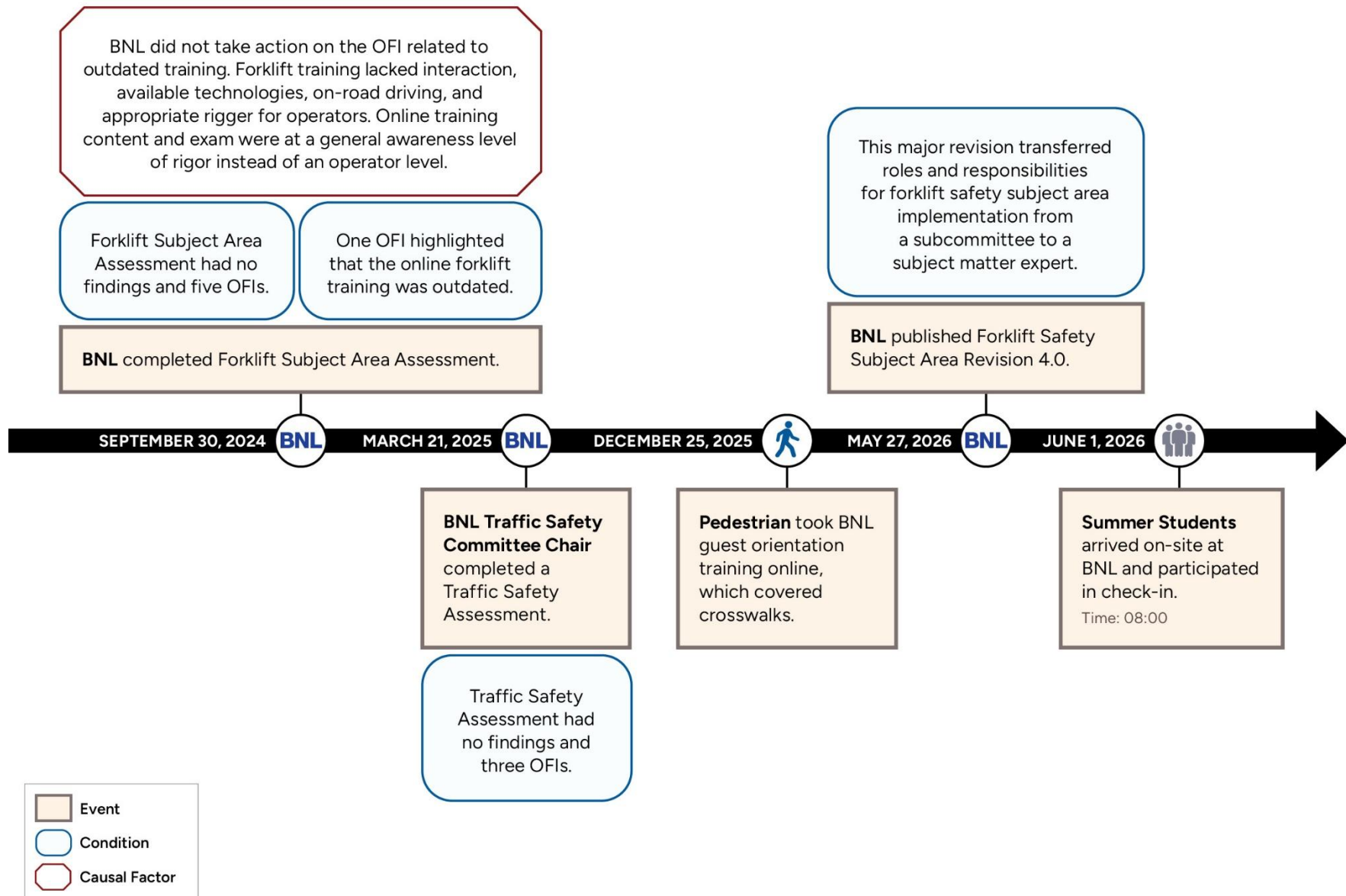
Factors	Accident Situation	Prior, Ideal or Accident-Free Situation	Difference	Evaluation of the Effect
	Bystander called 9-1-1 instead of BNL on-site emergency services number.	emergency services number after accident.		
How it Happened (e.g., How was Work Managed and Controlled)	Forklift was driven across BNL to refuel at diesel refueling station adjacent to Building 423.	Refueling would occur via fuel delivery.	Forklift would not have been present on the road with the Pedestrian.	Eliminates the event.
	No established road route for forklifts to use when going to refuel at diesel refueling station adjacent to Building 423.	A prescribed forklift driving route to refueling station would be established to avoid high-traffic areas.	Fewer interactions between forklift and cars/pedestrians/bicyclists.	Reduces likelihood of event.
	No stop sign at intersection by crosswalk.	Stop sign would have been installed at intersection by crosswalk.	Forklift and passing cars would be required to stop.	Significantly reduces the likelihood.
	No job hazard analysis for traveling to refuel at diesel refueling station adjacent to Building 423.	Hazards of forklift striking pedestrians would be identified, analyzed, and controlled.	Identification of hazards would enable mitigating measures such as escort vehicles or additional safety features.	Minimize likelihood of event.
Other Considerations	Undefined roles, responsibilities, accountability, and authority (R2A2) for BNL traffic safety.	Clear R2A2 for traffic safety would be established.	Clearly defined R2A2 for traffic safety would enable stronger safety measures such as use of escort vehicles for forklifts and improved crosswalk signage.	Unknown.
	Forklift online training was more than 20 years old and did not address all requirements and hazards operators are expected to encounter.	Online training would be up to date and would address all forklift operator expected activities, including on-road use.	Forklift operators are trained and tested on all site requirements.	Reduces the likelihood of event.
	Forklift Practical is not comprehensive.	Forklift practical would cover all situations a forklift driver is expected to perform, including on road use.	Operators periodically assessed and receive feedback on all activities the operator is expected to perform.	Reduces likelihood of event.
	Scene and evidence not comprehensively preserved.	Scene and evidence would be comprehensively preserved.	Allows for timely and effective investigation.	Improved quality of fact-finding and investigation.
	Unclear jurisdictional roles and responsibilities related to event investigation.	Jurisdictional roles and responsibilities on event investigation would be clearly defined and understood.	Ambiguities and jurisdictional issues negatively impacted scene and evidence preservation.	Improved quality of fact finding and investigation

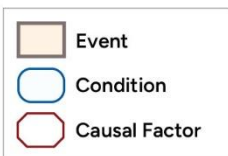
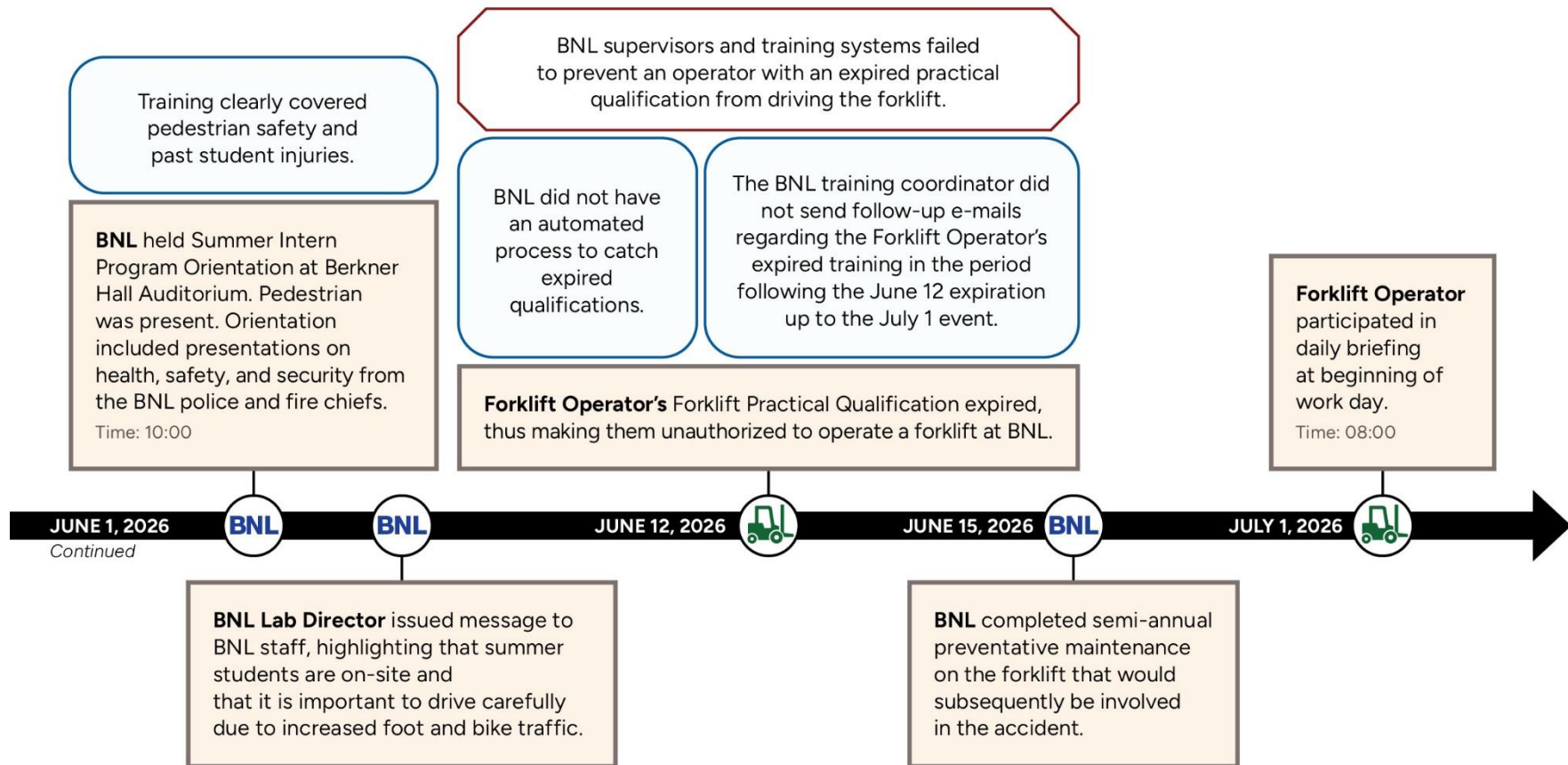
15 APPENDIX G: EVENTS AND CAUSAL FACTORS ANALYSIS

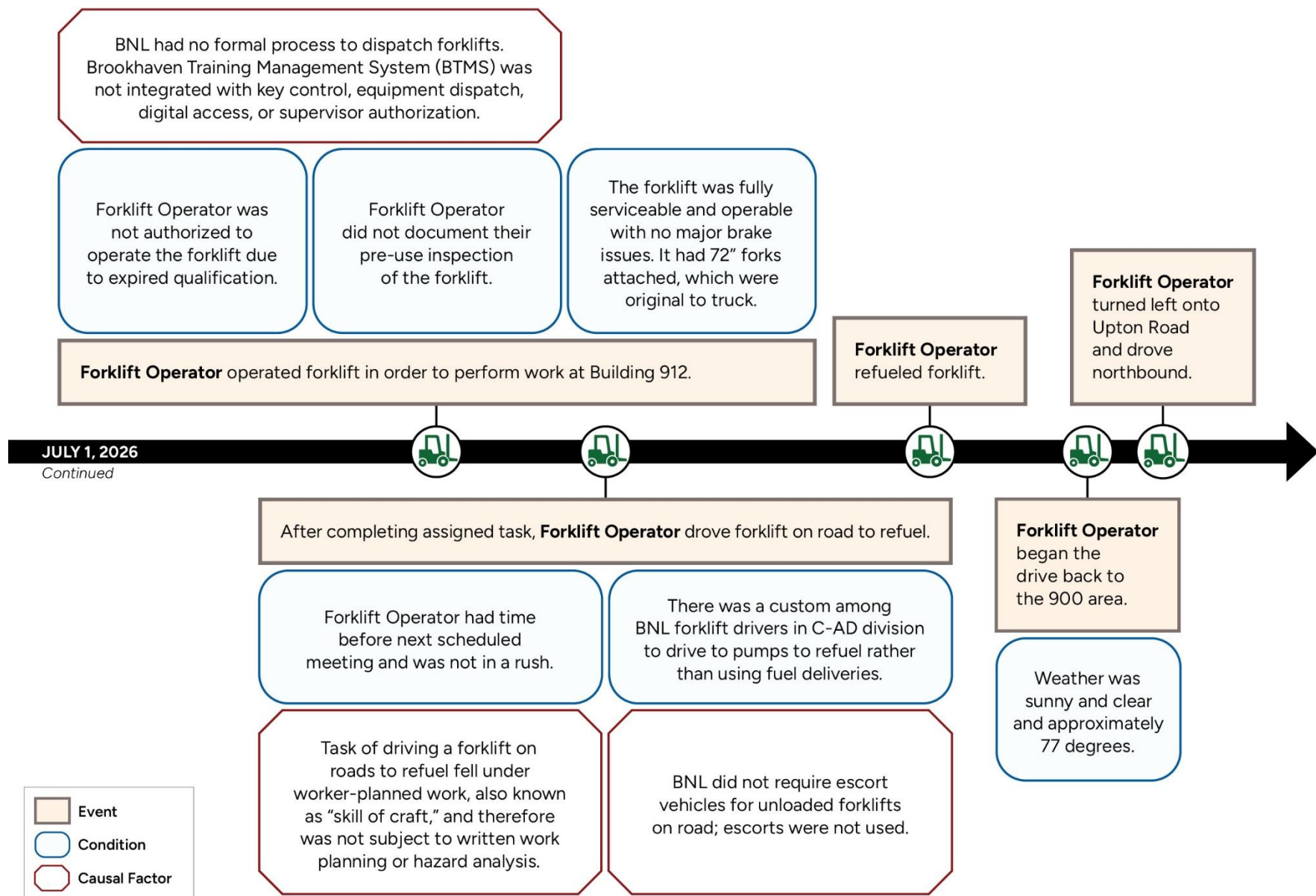
The image below provides a one-page summary of the Event and Causal Factors analysis. The following pages contain a detailed view of each section of the analysis.

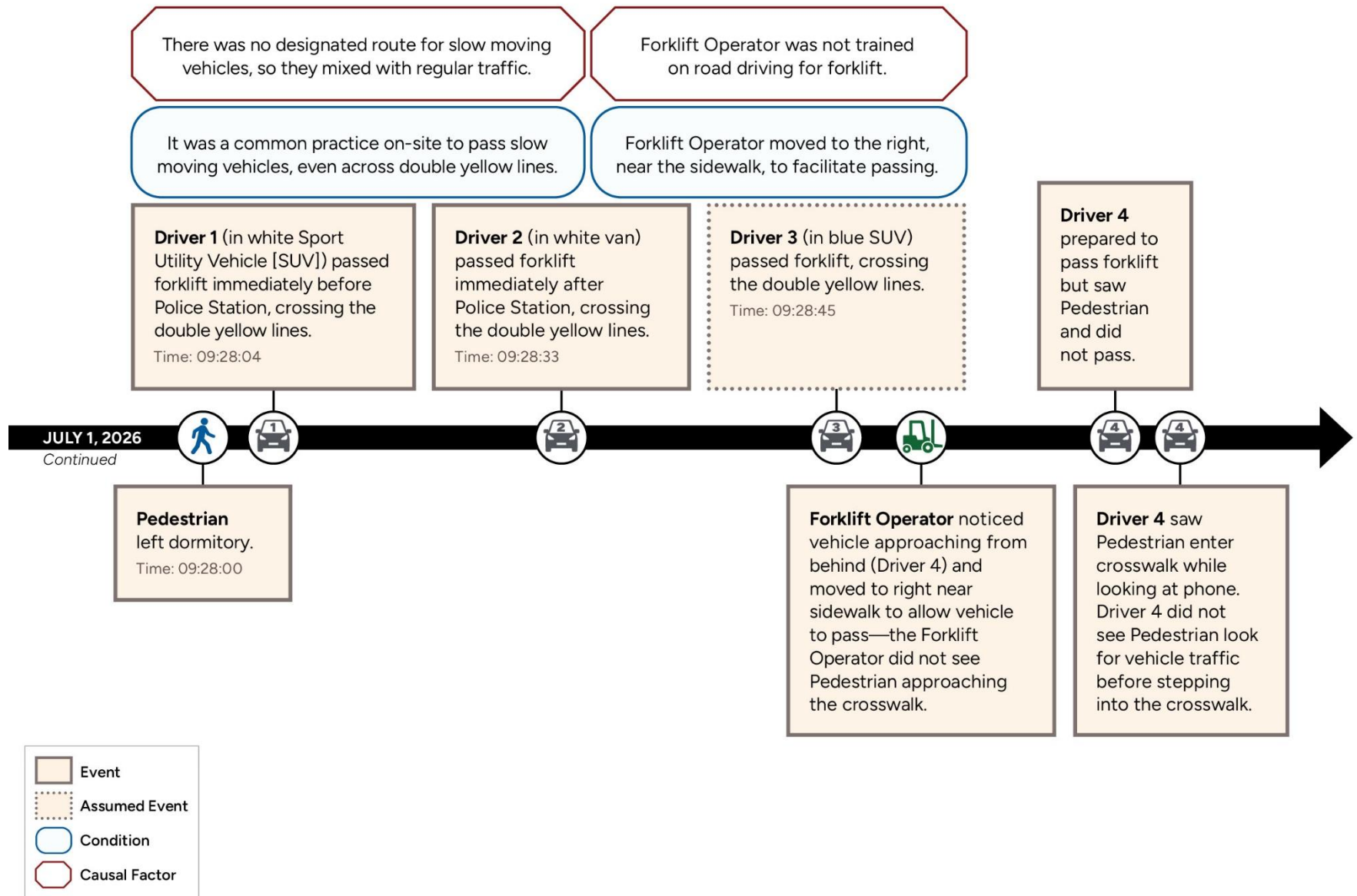


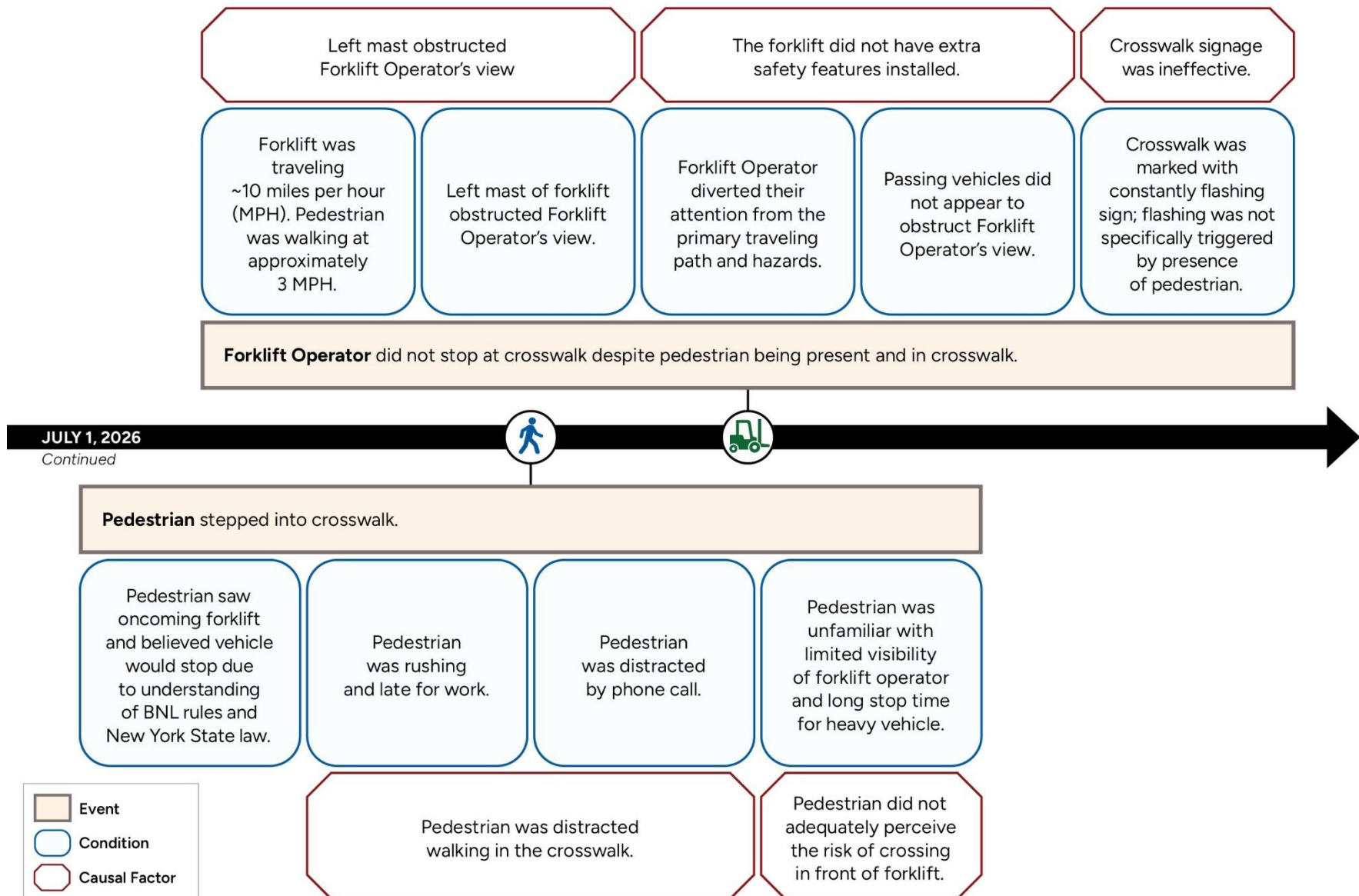


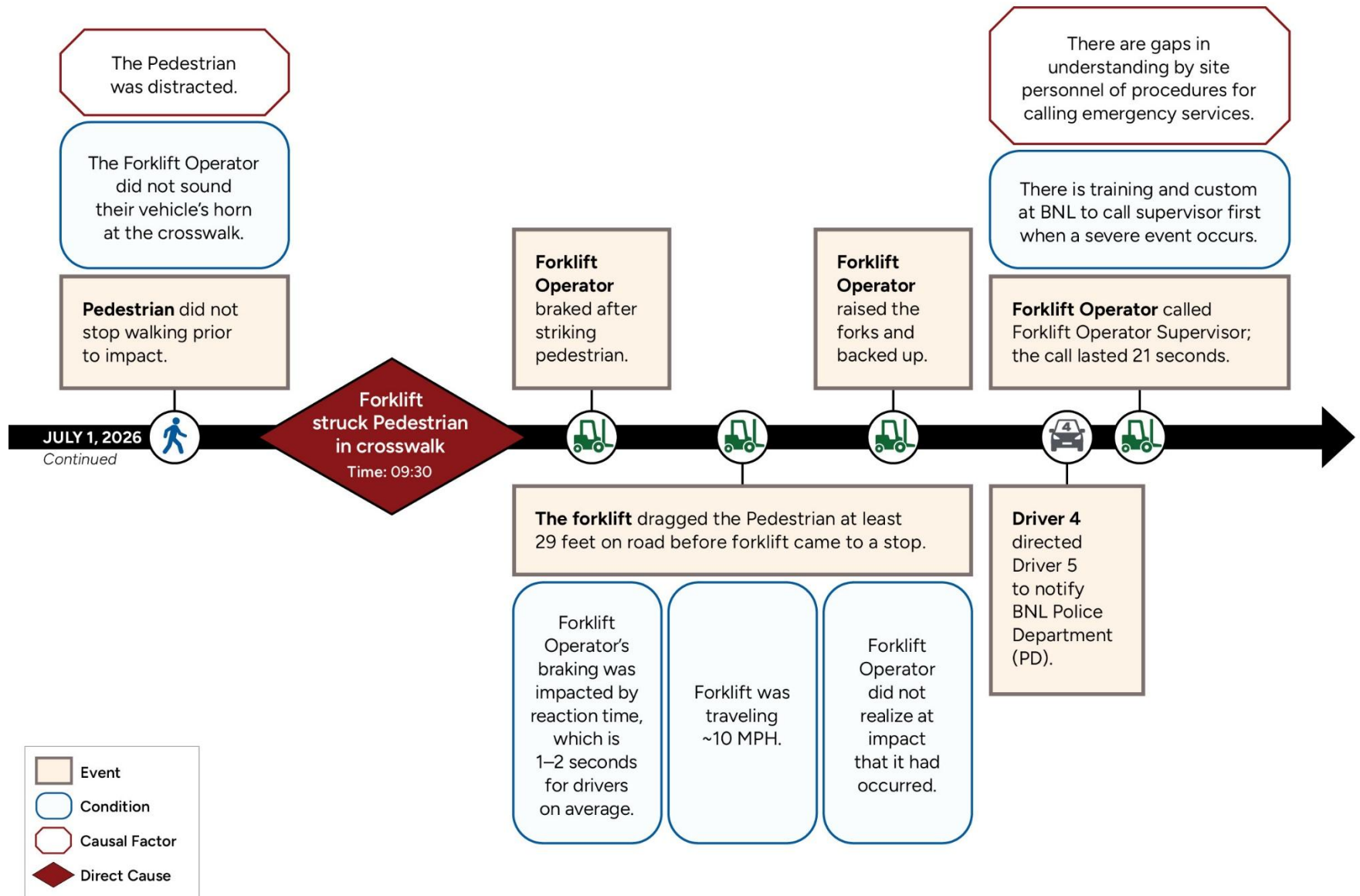


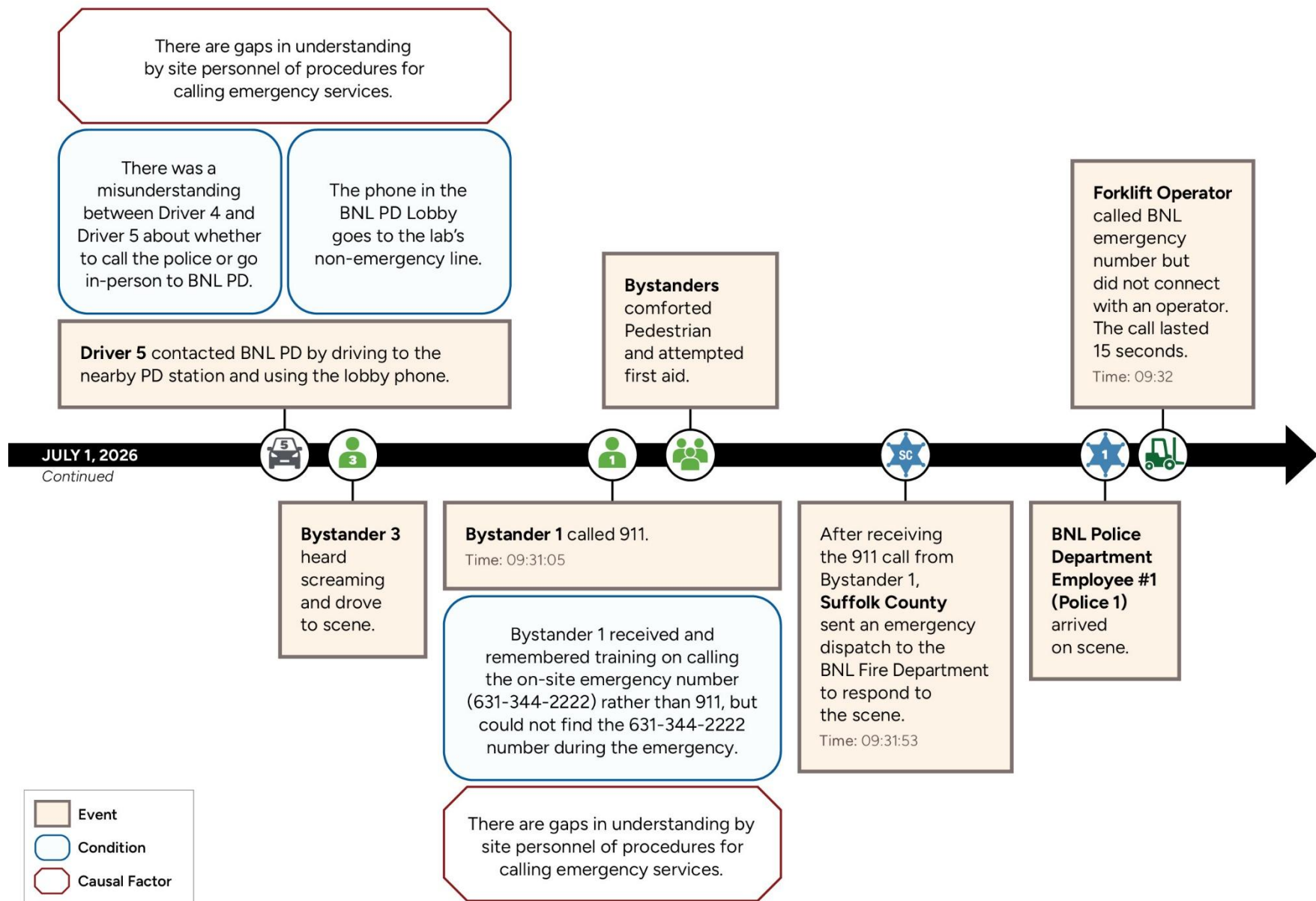


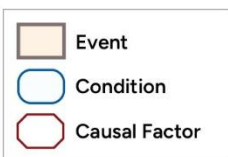
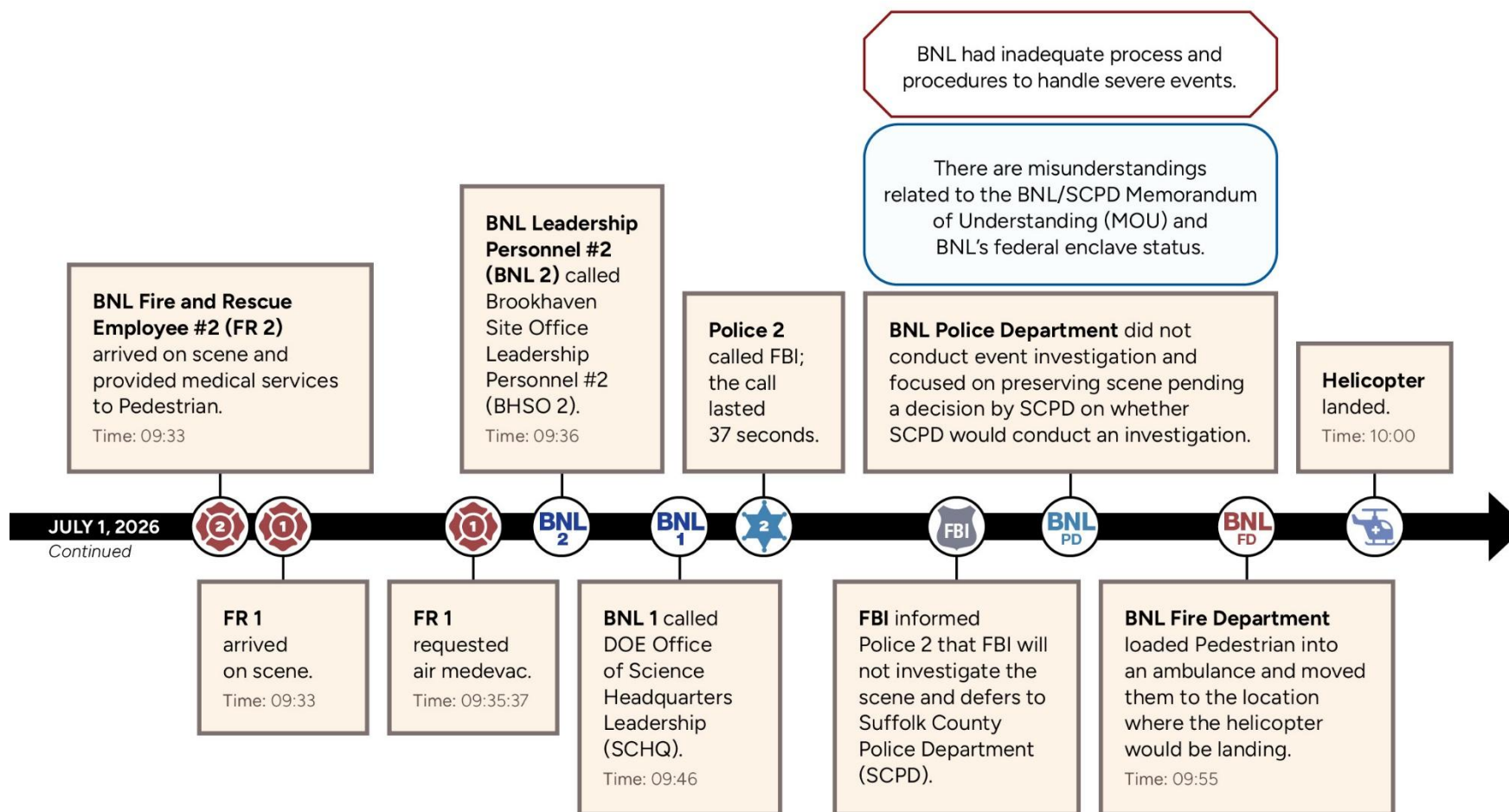


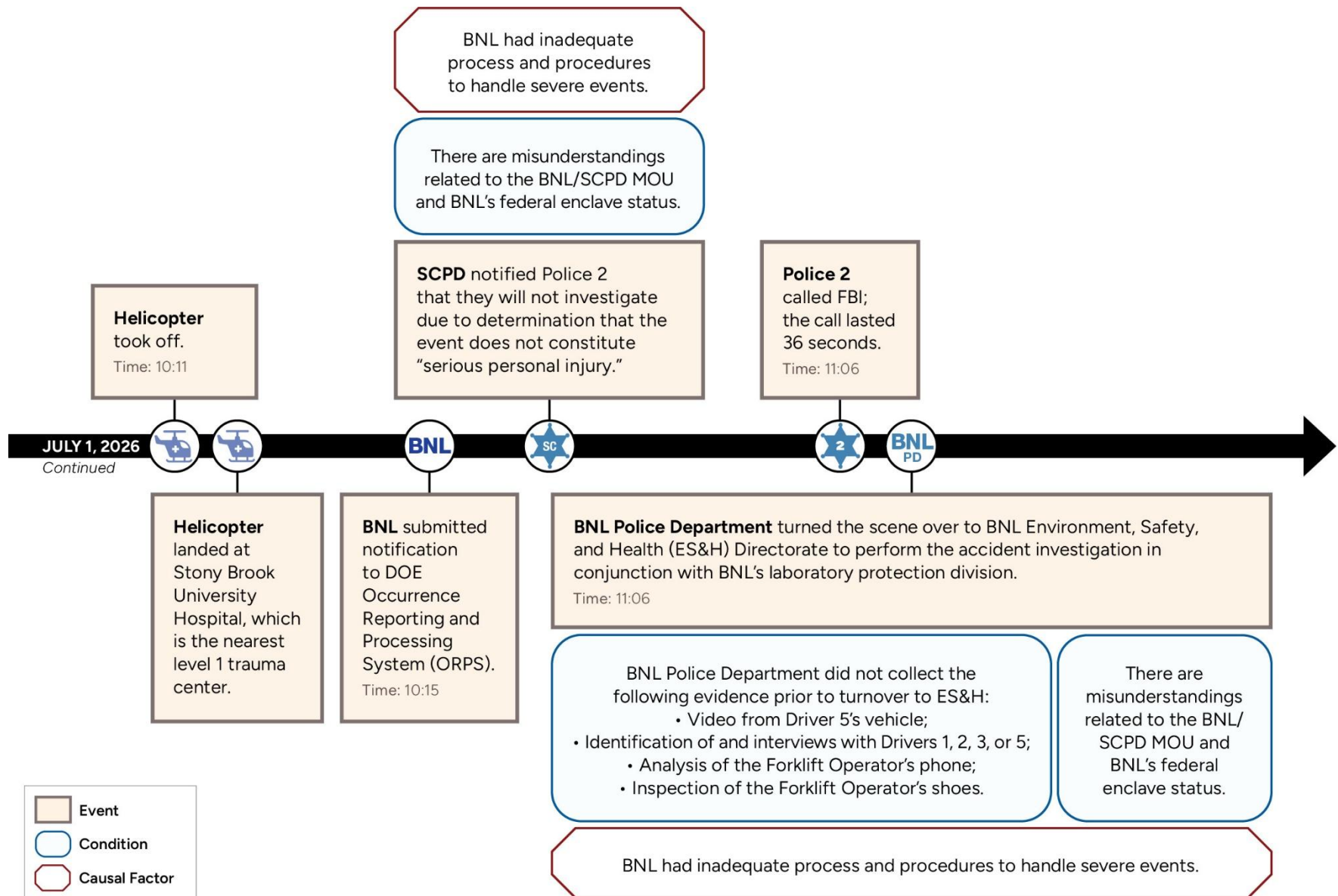


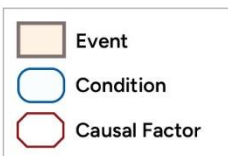
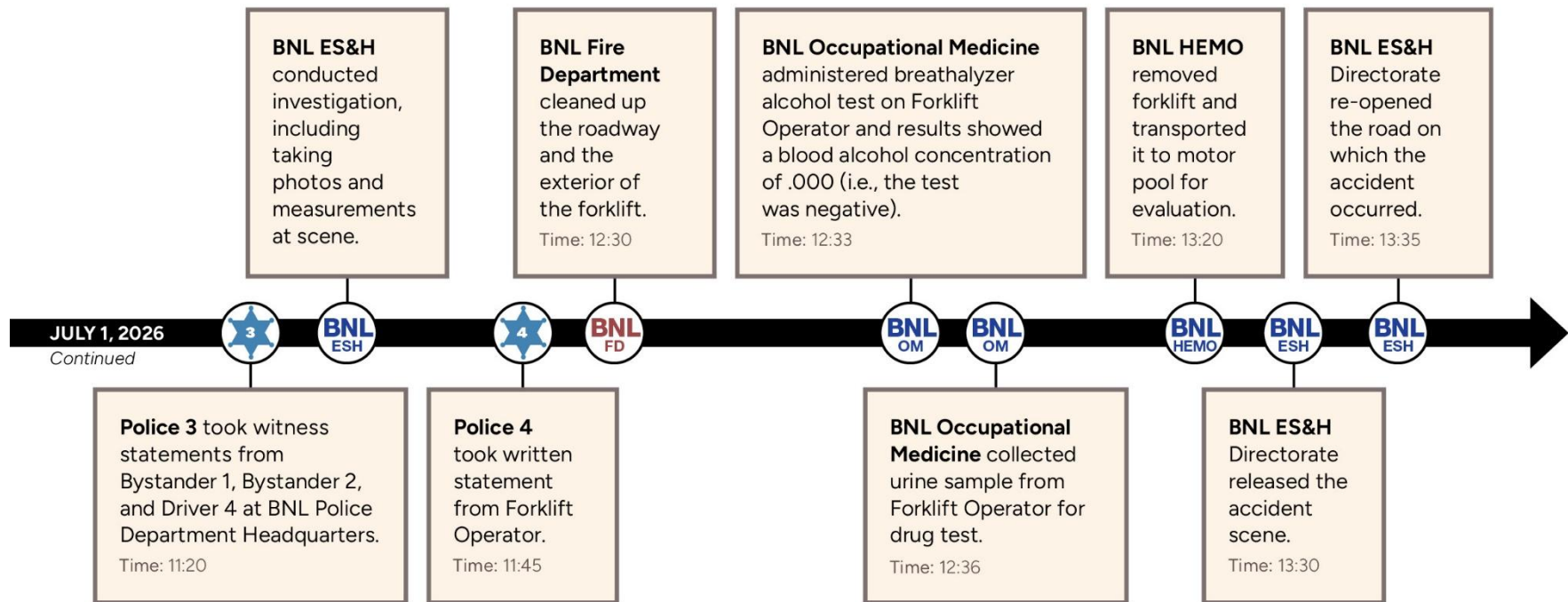


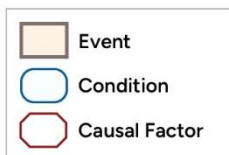
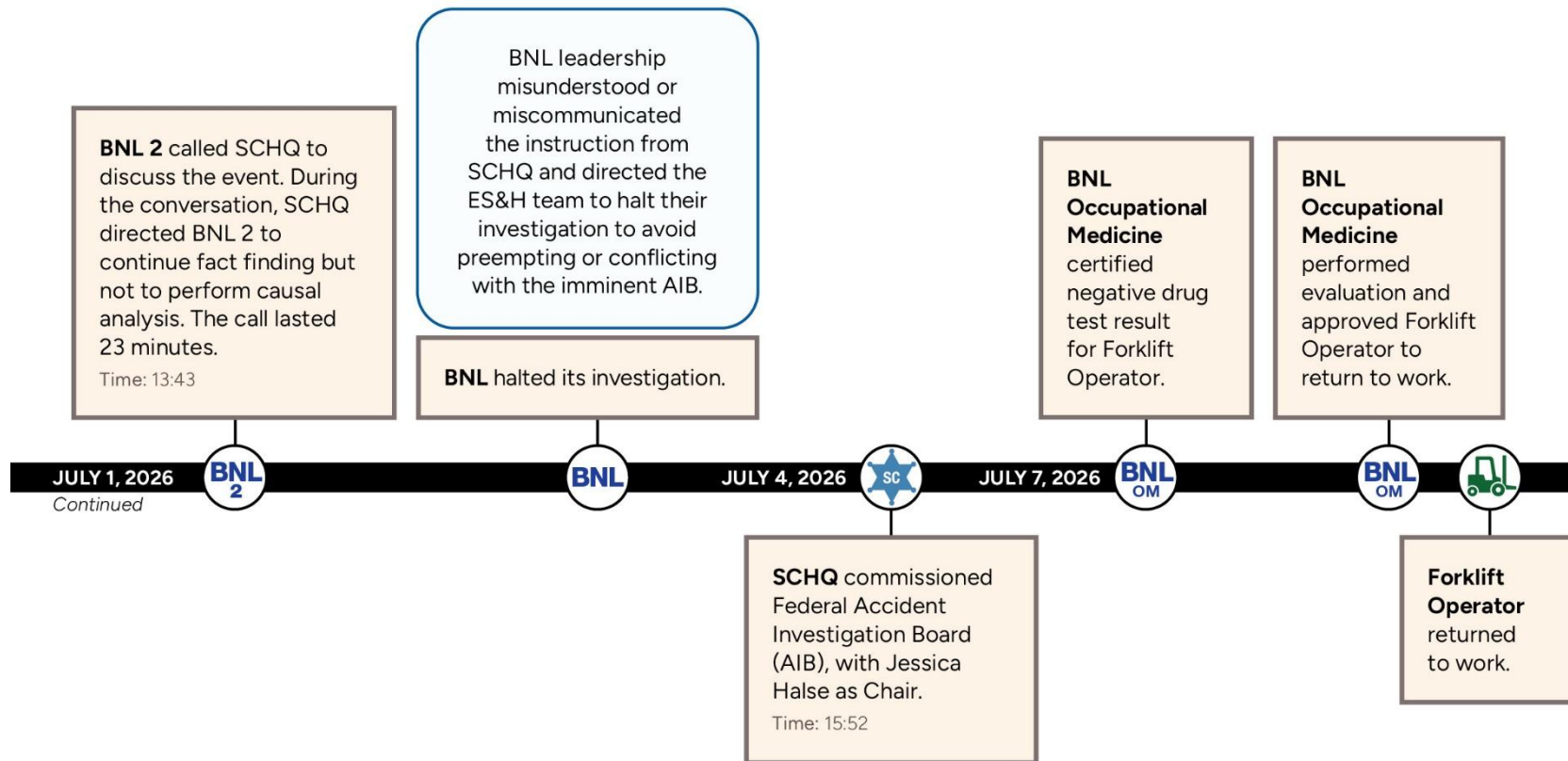












16 APPENDIX H: CROSSWALK OF CAUSES, CONCLUSIONS, AND JUDGMENTS OF NEED

Contributing, Direct, and Root Causes	Conclusions	Judgments of Need
Organization, Culture, and People		
CC 1—Previous DOE forklift events did not provide sufficient corrective actions to prevent recurrence.	None.	JON 1—BNL should develop a policy that minimizes the operation of forklifts on roadways.
		JON 2—BNL should evaluate and document forklift hazards and implement mitigating measures such as additional safety features and use of escort vehicles when forklift usage of the roadway is unavoidable.
CC 2—BNL’s culture of normalizing noncompliance with site procedures contributed to the failure to prevent an operator with an expired practical qualification from driving the forklift.	CON 2—Repeated instances of personnel not following procedures in multiple disciplines that the Board reviewed suggest a laboratory culture that normalizes noncompliance.	JON 7—BNL leadership should establish a culture where line management is held accountable for procedural compliance within their organizations.
	CON 14—BNL supervisors and training systems failed to prevent an operator with an expired practical qualification from driving the forklift.	JON 8—BNL supervisors should systematically hold employees accountable for procedural compliance.
CC 3—The Forklift Operator exercised inadequate surveillance by focusing on moving to the right of the lane and monitoring passing vehicles, resulting in decreased attention to pedestrians.	CON 3—The Forklift Operator exercised inadequate surveillance, which led to not visually identifying the Pedestrian approaching the crosswalk.	JON 1—BNL should develop a policy that minimizes the operation of forklifts on roadways.
	CON 9—BNL culture has normalized passing slow-moving industrial vehicles across double yellow lines; this created an unsafe traffic environment.	JON 2—BNL should evaluate and document forklift hazards and implement mitigating measures such as additional safety features and use of escort vehicles when forklift usage of the roadway is unavoidable.
	CON 12—BHSO identified vehicle safety as a key laboratory-wide risk in 2025 but did not incorporate vehicle safety into the site office’s assessment schedule.	JON 6—BNL should revise its forklift training and qualification program to ensure it addresses all work activities and hazards and reflects high-quality curriculum and highly trained evaluators.
		JON 8—BNL supervisors should systematically hold employees accountable for procedural compliance.
LRC 1—When entering the crosswalk, the Pedestrian believed the forklift would stop and did not adequately perceive the risk that the Forklift Operator would not see them or would be unable to stop in time.	CON 1—The Pedestrian was distracted while walking. This impacted their situational awareness and risk perception and contributed to the fact that they did not stop walking in the crosswalk or take other evasive action.	JON 1—BNL should develop a policy that minimizes the operation of forklifts on roadways.
	CON 11—BNL did not adequately identify and analyze the hazards of routine forklift roadway travel, resulting in a failure to develop and implement effective controls consistent with ISMS principles.	JON 2—BNL should evaluate and document forklift hazards and implement mitigating measures such as additional safety features and use of escort vehicles when forklift usage of the roadway is unavoidable.
	CON 13—Student safety orientation and traffic safety messaging campaigns clearly communicated lab expectations for pedestrian, bicyclist, and automobile safety in most areas, but did not address the hazard of industrial vehicles to pedestrians.	JON 9—BNL should develop a Walking is Working campaign, consistent with National Safety Council guidance.

Contributing, Direct, and Root Causes	Conclusions	Judgments of Need
LRC 2 —The Forklift Operator failed to see the Pedestrian and failed to stop at the crosswalk.	CON 3 —The Forklift Operator exercised inadequate surveillance, which led to not visually identifying the Pedestrian approaching the crosswalk.	JON 6 —BNL should revise its forklift training and qualification program to ensure it addresses all work activities and hazards and reflects high-quality curriculum and highly trained evaluators.
	CON 5 —BNL did not install additional available safety features that would have provided advance warning to the Forklift Operator and the Pedestrian.	JON 2 —BNL should evaluate and document forklift hazards and implement mitigating measures such as additional safety features and use of escort vehicles when forklift usage of the roadway is unavoidable.
	CON 10 —Passive pedestrian crosswalk signage does not alert drivers to the presence of a pedestrian in a crosswalk.	JON 4 —BNL should consider adding pedestrian-triggered Rectangular Rapid Flashing Beacons at the approaches to the crosswalk where the accident happened, and at the other crosswalks where there is no stop sign for vehicular traffic.
	CON 11 —BNL did not adequately identify and analyze the hazards of routine forklift roadway travel, resulting in a failure to develop and implement effective controls consistent with ISMS principles.	JON 1 —BNL should develop a policy that minimizes the operation of forklifts on roadways.
	CON 12 —BHSO identified vehicle safety as a key laboratory-wide risk in 2025 but did not incorporate vehicle safety into the site office’s assessment schedule.	
CC 4 —The Pedestrian was distracted by cell phone use when walking in the crosswalk, which impacted their situational awareness and risk assessment of the approaching forklift.	CON 1 —The Pedestrian was distracted while walking. This impacted their situational awareness and risk perception and contributed to the fact that they did not stop walking in the crosswalk or take other evasive action.	JON 9 —BNL should develop a “Walking is Working” campaign, consistent with National Safety Council guidance.
Forklift Program and Features		
CC 5 —The forklift did not have additional installed safety features that could have alerted the Forklift Operator or Pedestrian prior to the collision.	CON 5 —BNL did not install additional available safety features that would have provided advance warning to the Forklift Operator and the Pedestrian.	JON 2 —BNL should evaluate and document forklift hazards and implement mitigating measures such as additional safety features and use of escort vehicles when forklift usage of the roadway is unavoidable.
SRC 1 —BNL allowed the common practice of driving to refuel instead of calling for a fuel truck, which resulted in the forklift being on the roadway.	CON 6 —The common practice of driving to refuel instead of calling for a fuel truck resulted in the unescorted forklift driving on the roadway unnecessarily.	JON 1 —BNL should develop a policy that minimizes the operation of forklifts on roadways.
SRC 2 —BNL did not conduct a documented hazard analysis for on-road forklift operations, resulting in failure to identify and implement measures to prevent forklifts striking pedestrians.	CON 11 —BNL did not adequately identify and analyze the hazards of routine forklift roadway travel, resulting in a failure to develop and implement effective controls consistent with ISMS principles.	JON 2 —BNL should evaluate and document forklift hazards and implement mitigating measures such as additional safety features and use of escort vehicles when forklift usage of the roadway is unavoidable.
CC 6 —Visual obstruction due to the forklift’s left mast, the speed of the forklift, and the speed of the Pedestrian resulted in continuous occlusion of the Pedestrian.	CON 3 —The Forklift Operator exercised inadequate surveillance, which led to not visually identifying the Pedestrian approaching the crosswalk.	JON 6 —BNL should revise its forklift training and qualification program to ensure it addresses all work activities and hazards and reflects high-quality curriculum and highly trained evaluators.
	CON 5 —BNL did not install additional available safety features that would have provided advance warning to the Forklift Operator and the Pedestrian.	

Contributing, Direct, and Root Causes	Conclusions	Judgments of Need
	CON 11 —BNL did not adequately identify and analyze the hazards of routine forklift roadway travel, resulting in a failure to develop and implement effective controls consistent with ISMS principles.	JON 2 —BNL should evaluate and document forklift hazards and implement mitigating measures such as additional safety features and use of escort vehicles when forklift usage of the roadway is unavoidable.
Not applicable.	CON 4 —Involved forklift was regularly maintained, recently serviced, and mechanical deficiencies were not a factor in the accident.	None.
Traffic Safety		
CC 7 —The BNL Traffic Safety Committee did not have sufficient authority and accountability to comprehensively advance traffic safety on-site.	CON 7 —BNL does not have clear lines of roles, responsibilities, authorities, and accountability for traffic safety.	JON 5 —BNL should establish clear roles, responsibilities, authorities, and accountability for traffic safety to ensure timely implementation of recommendations from the expert traffic safety review.
	CON 12 —BHSO identified vehicle safety as a key laboratory-wide risk in 2025 but did not incorporate vehicle safety into the site office’s assessment schedule.	
SRC 3 —BNL permitted forklifts to drive unescorted on roadways when unloaded, resulting in an operator driving a forklift with obscured vision.	CON 11 —BNL did not adequately identify and analyze the hazards of routine forklift roadway travel, resulting in a failure to develop and implement effective controls consistent with ISMS principles.	JON 1 —BNL should develop a policy that minimizes the operation of forklifts on roadways.
		JON 2 —BNL should evaluate and document forklift hazards and implement mitigating measures such as additional safety features and use of escort vehicles when forklift usage of the roadway is unavoidable.
CC 8 —BNL culture has normalized passing slow-moving vehicles, even across double yellow lines, which creates a risk of forklift operators exercising inadequate surveillance of the path ahead.	CON 9 —BNL culture has normalized passing slow-moving industrial vehicles across double yellow lines; this created an unsafe traffic environment.	JON 3 —BNL should commission an expert traffic safety review of the laboratory campus.
		JON 8 —BNL supervisors should systematically hold employees accountable for procedural compliance.
		JON 7 —BNL leadership should establish a culture where line management is held accountable for procedural compliance within their organizations.
CC 9 —The crosswalk configuration and signage were ineffective to alert the Forklift Operator to the Pedestrian’s presence.	CON 8 —BNL has not completed a traffic safety engineering analysis to evaluate roads, signage, crosswalks, and pedestrian interactions across the laboratory.	JON 3 —BNL should commission an expert traffic safety review of the laboratory campus.
	CON 10 —Passive pedestrian crosswalk signage does not alert drivers to the presence of a pedestrian in a crosswalk.	JON 4 —BNL should consider adding pedestrian-triggered Rectangular Rapid Flashing Beacons at the approaches to the crosswalk where the accident happened, and at the other crosswalks where there is no stop sign for vehicular traffic.
Training		
CC 10 —BNL’s outdated forklift online course, incomplete practical assessment, and the inconsistent evaluator qualification process did not address on-road driving, resulting in the Forklift Operator not being prepared for all hazards they would encounter.	CON 15 —Online training, JPM practical training, and forklift procedures were incomplete and did not address all conditions and hazards operators would encounter. Specific gaps included on-road usage, including crosswalks, horn use, restricted visibility, pedestrian right-of-way, and mixed-traffic roadway operation; and addressing all classes and types of forklifts used by operators.	JON 6 —BNL should revise its forklift training and qualification program to ensure it addresses all work activities and hazards and reflects high-quality curriculum and highly trained evaluators.

Contributing, Direct, and Root Causes	Conclusions	Judgments of Need
LRC 1 —When entering the crosswalk, the Pedestrian believed the forklift would stop and did not adequately perceive the risk that the Forklift Operator would not see them or would be unable to stop in time.	CON 13 —Student safety orientation and traffic safety messaging campaigns clearly communicated lab expectations for pedestrian, bicyclist, and automobile safety in most areas, but did not address the hazard of industrial vehicles to pedestrians.	JON 9 —BNL should develop a “Walking is Working” campaign, consistent with National Safety Council guidance.
CC 2 —BNL’s culture of normalizing noncompliance with site procedures contributed to the failure to prevent an operator with an expired practical qualification from driving the forklift.	CON 14 —BNL supervisors and training systems failed to prevent an operator with an expired practical qualification from driving the forklift.	JON 8 —BNL supervisors should systematically hold employees accountable for procedural compliance.
		JON 7 —BNL leadership should establish a culture where line management is held accountable for procedural compliance within their organizations.
Response		
Not applicable.	CON 16 —BNL Fire Rescue provided superb initial response to the injured Pedestrian and immediately requested air medivac services, which resulted in the Pedestrian getting to the hospital within the medical “golden hour.”	None.
Not applicable.	CON 17 —Bystanders made notifications and provided valuable comfort and support to the Pedestrian until emergency personnel arrived.	None.
Not applicable.	CON 18 —BNL failed to comprehensively investigate the accident and to collect several witness statements and pieces of evidence that were potentially important to understanding the accident.	JON 10 —BNL should improve processes for scene preservation and evidence collection to ensure effective event investigations.
Not applicable.	CON 19 —BNL’s status as an exclusive federal enclave makes law enforcement investigations complex, and BNL does not have effective processes and procedures for navigating this complex environment.	JON 10 —BNL should improve processes for scene preservation and evidence collection to ensure effective event investigations.
Other		
DC —Forklift struck Pedestrian in crosswalk.	CONs 1–14 are applicable.	JONs 1–9 are applicable.