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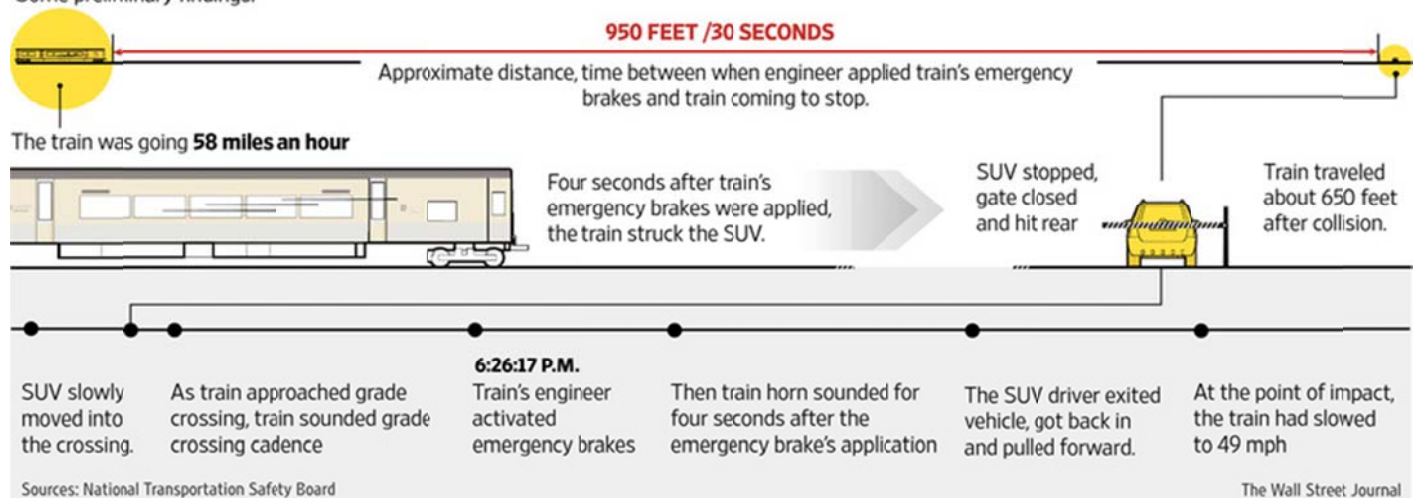
# Engineer's Struggle to Stop Metro-North Train

## Federal Investigators Plan to Create Timeline of Events Leading to Crash

By  
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Feb. 6, 2015 8:52 p.m. ET

### Timeline of a Tragedy

The National Transportation Safety Board is compiling a detailed account of what led up to Tuesday's Metro-North Railroad crash. Some preliminary findings:



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For the train's engineer, it began as a struggle in the darkness against the laws of physics.

At first, Steven Smalls, who was operating the Metro-North Railroad train in Tuesday evening's deadly crash, saw a reflection on a road crossing ahead, a National Transportation Safety Board official said Friday.

But as soon as Mr. Smalls realized that he and hundreds of passengers were on a collision course with a sport-utility vehicle on Westchester County tracks, he triggered the commuter train's emergency brakes, the safety board official said.

It was too late. The train, which was traveling through Valhalla, N.Y., at 58 miles an hour, slowed to 49 miles before slamming into the SUV. The train traveled about 650 feet down the tracks after the collision, according to the official.



ENLARGE

NTSB officials inspect the Metro-North train involved in a fatal crash on Tuesday. Photo: National Transportation Safety Board

“We are going to create a timeline of everything that happened in this event to put this together,” said the NTSB official, Robert Sumwalt, in his last on-site media briefing in an investigation that could take more than a year to complete.

The wreck engulfed the SUV and the front of the train in flames, killing five passengers and the vehicle’s driver.

It came only a little more than a year after a December 2013 Metro-North derailment in the Bronx that killed four passengers, and marked another blow to the nation’s second-busiest commuter railroad.

As investigators comb through the charred Metro-North train to find out what went wrong, railroad experts said Mr. Smalls appeared to have done all he could to stop the train.

An attorney for Mr. Smalls, who was released from a hospital on Wednesday and interviewed by the NTSB the next day, said he wasn’t available for comment on Friday.



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A Metro-North train moves past the crossing on the commuter railroad's Harlem line in Valhalla, N.Y., where another train collided with an SUV on Tuesday. Photo: Kevin Hagen for The Wall Street Journal

### Earlier Coverage

- [NTSB Investigates Train Involved in Crash](#)
- [Walter Liedtke: A Reflection and Appreciation](#)
- [Train Crossing Systems Were Working at Time of Crash](#) (Feb. 5, 2015)
- [Rail Crossings Safer, Still Perilous](#) (Feb. 5, 2015)
- [As Train Burned, Riders Waited to Get Out](#) (Feb. 5, 2015)
- [Metro-North Train Crashes Into SUV in Valhalla, N.Y., Killing Six](#) (Feb. 4, 2015)

Mr. Smalls joined the railroad in 2010 as an electrician but was qualified to operate trains in March 2013, Mr. Sumwalt said.

Working against Mr. Smalls before the crash, experts said, were time, distance and the sheer momentum of the train, whose eight cars each weigh about 128,000 pounds.

“Trains have incredible velocity, and it takes a long time to stop,” said Robert Paaswell, former executive director of the Chicago Transit Authority who now teaches civil engineering at City College of New York.

Stopping a train traveling at 58 mph could mean traveling more than a half-mile from the point that its engineer activates its emergency brakes, rail experts said.



The problem is that the engineer likely can't see that far, especially at night, said Steven Ditmeyer, who teaches railway management at Michigan State University and who has a background in railroad engineering and operations.

"The train engineer can't see a half-mile or a mile down the tracks," Mr. Ditmeyer said.

Slowing down a train to a speed less likely to end in death could take nearly as long, railroad experts said.

The likelihood of fatalities from crashes at railroad crossings significantly increases when trains are traveling at 30 mph or more, according to Grady Cothen, a former top safety official at the Federal Railroad Administration.

But experts said trains traveling at even 10 mph can still cause damage and death.



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U.S. Sen. Chuck Schumer of New York, right, and U.S. Sen Richard Blumenthal of Connecticut pause for a moment of silence after Schumer left flowers at the site of the crash. Photo: Kevin Hagen for The Wall Street Journal

"Whatever it hits, it's going to cause a tremendous amount of damage," Mr. Paaswell said

Mr. Sumwalt said the NTSB on Friday began to conduct 3-D laser scans of the exterior and interior of the first train car, which suffered extensive fire damage.

Investigators also determined Friday that there were a dozen 39-foot sections of third rail that punctured the train. The electrified third rail powers the Metro-North in this section of the system.

NTSB officials still haven't determined what could have caused the third rail to break apart.

After the crash, Mr. Smalls helped more than five passengers evacuate the smoke-filled train, Mr. Sumwalt said.

But the fire grew too intense to help further.

“It goes without saying that he’s very traumatized,” Mr. Sumwalt said of Mr. Smalls.

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