













By the 2019 Young Scholars of PS 282

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New York Transit Museum

The New York Transit Museum is the largest museum in the United States devoted to urban public transportation history and one of the premier institutions of its kind in the world. The Museum explores the development of the greater New York metropolitan region through the presentation of exhibitions, tours, educational programs and workshops dealing with the cultural, social and technological history of public transportation. Since its inception over forty years ago, the Museum—which is housed in a historic 1936 IND subway station in Downtown Brooklyn—has grown in scope and popularity. The Museum also maintains a gallery at Grand Central Terminal, an archive and an off-site 14,000 sf collections storage facility. To learn more, visit nytransitmuseum.org.

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Foreword

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Though I moved to Brooklyn only a year ago, New York City is still a large part of my identity. My father emigrated from Pakistan to New York City back in the '70s and chose to live in Jersey City due to its close proximity to the Big Apple. Because of this, I grew up riding the subway, and as a child, I sat in awe of the different types of commuters I encountered. However, as an adult, I, like many of my fellow New Yorkers, disregarded the subway's rich history and only viewed it as a means to my destination.

My goal as an educator for the Young Scholars of PS 282 was to tear down this simplistic view of our city's transportation system. I wanted the students to immerse themselves into the sights, smells, and experiences of passengers and transit workers of the past. The methodology behind this form of pedagogy stems from the fact that so much of our modern subway system exists because of mishaps, accidents, and outdated technology from over a century ago. In each lesson, as we learned about experiences passengers and workers had on older trains in New York City, the picture of our transit system today became clearer to the Young Scholars. Why are our subway seats made out of hard plastic? Because before plastic was invented, the older material ripped too easily, and even at times tore through women's stockings! Why do our trains run on electricity today? Because it's much more efficient, and the trains move quicker than trains that used to run on coal! Through investigating the trials and errors in our transit history, the Young Scholars successfully pieced together a narrative of technological progression leading to our present-day conveniences on public transportation.

Writing a comprehensive book about transit history is a daunting task for any adult to attempt. For this reason, I am still in awe of the Young Scholars' aptitude in handling this difficult topic. Though this book is specifically about the Brooklyn Rapid Transit company, the students managed to capture New York City's transportation history as a whole and showcased impressive skills in analyzing original historical documents. Many of the references used are primary sources—some of which were newspaper articles deciphered by the Young Scholars and expertly quoted in the text of this book. The story of Marshall Mabey, the sandhog in Chapter 4, is a direct example of this. Using his exact words to describe his ordeal in surviving a horrible accident while constructing subway tunnels under the East River allows readers to empathize with the dangers many laborers faced in building our transportation system.

The Brooklyn Rapid Transit Book is a record of historical analyses and oral history of our transit system's past, written by brilliant adolescent students. Though I joined this project as an educator to instruct, I left as a learner. Suffice to say, I learned a lot from the Young Scholars of PS 282. In fact, there are many aspects of transit history in this book that the students discovered through their own research.

With that being said, we present to you *The Brooklyn Rapid Transit Book*, and we hope that you enjoy the next stop on this journey about the Brooklyn Rapid Transit company!

Minna Nizam

2019 PS 282 Young Scholars Program Educator

Introduction

Salutations Transit Historians! What you are about to read is something that you may have not really thought about. It is, drum roll please... the BRT! The BRT, which stands for Brooklyn Rapid Transit, was the second PRIVATE train company in New York City to go underground. The first was the IRT, (Interborough Rapid Transit Company), on October 27, 1904.

Do not just think that the BRT only made trains because that is incorrect! The BRT became a transportation system in 1896 that included elevated trains, trolleys, and eventually underground subway lines. In 1923, the BRT changed to the BMT (Brooklyn Manhattan Transit). One reason was because of a 1918 accident, when a young inexperienced BRT worker caused one of the most harmful crashes in New York City's subway history.

So keep on reading to find out more about the BRT!

There are three companies that originally made up our subway lines in NYC: the BRT/BMT, the IRT, and the IND. The BMT and the IND are today's lettered (alphabet) lines, and are called the B Division.

Examples of former BRT/BMT subway lines are today's Franklin Avenue Shuttle, the J-Z, the N and R, the L, the Q in Brooklyn and Manhattan south of 57th St., and the F and D routes in Brooklyn. The IRT is today's numbered lines. The BMT and the IRT were private companies until the NYC government bought them in 1940. The IND has been city-owned since the time it started in 1932.





The Beginning of the BRT & the Making of the Subway





C.H. Jordan, [New York City. Blizzard of 1888: street scene during blizzard], 1888, photographic print, LC-USZ62-43668; Library of Congress Prints and Photographs Division.



here was skepticism over subways until March of 1888, because the idea of placing trains underground at the time was unusual and the cost was expensive. Using electric power for the trains was not possible yet. If these dates seem familiar, that is because that was when the Great Blizzard of 1888 happened. It was pretty destructive. Four hundred people died, and it snowed 55 inches. New Jersey, New York, Massachusetts, Rhode Island, and Connecticut were all affected. New Hampshire got 36 inches of snow, Connecticut got 45 inches, and New York got 55 inches. Trains were elevated (above ground) at the time. The snow stopped train service in the city. Tracks froze on BRT elevated lines; one was on the Brooklyn Bridge. Some people were trapped on elevated trains during the blizzard for up to 24 hours. When the train would move, the engine would give heat to the seats, so when it stopped there was no heat. Some of the firemen who rescued people on these trains didn't have ladders tall enough to save them! They tied small ladders together to make bigger ladders. Afterward, people realized that the only way to keep this from happening again was to have trains go underground for service.



Putting trains underground seemed unusual before 1888 because elevated trains in New York City mostly used steam engines. However, when Boston made headlines for putting an electrified train underground in 1897, the idea was not so farfetched anymore! 1

The Great Blizzard of 1888 was such a severe blizzard, that it received the nickname, "The Great White Hurricane." Because there was no technology to predict weather back then, no one expected such a devastating snowstorm to hit the east coast of the United States! Winds were blowing up to 100 miles per hour and so much snow fell on the ground, that many elevated train tracks, telephone lines, and power lines froze. Because many forms of transportation back then used horses, about 500,000 pounds of horse poop froze on the streets of New York City!²

^{1 &}quot;BOSTON'S SUBWAY FINISHED; After Many Protests and Complaints Rapid Transit for the Hub Is Assured." *The New York Times*, August 15, 1897.

^{2 &}quot;The Great Blizzard of 1888," NYCdata, accessed March 13, 2019 http://www.baruch.cuny.edu/nycdata/disasters/blizzards-1888.html.a





The Workers of the BRT

Women worked as conductors, engineers, ticket booth clerks, and track workers during both World Wars.





Streetcars and horse-drawn carriages ran along the outer roadways of the Brooklyn Bridge while elevated trains along the inner tracks.

Detroit Publishing Co., Brooklyn terminal, Brooklyn Bridge, circa 1903, dry plate negatives, LC-D4-16664; Library of Congress Prints and Photographs Division.



andhogs were the workers who helped dig tunnels and construct bridges for the trains. The sandhogs used pickaxes, shovels, and dynamite.

The sandhogs constructed two types of tunnels for the subway: "cut and cover" tunnels and deep-bored tunnels. "Cut and cover" tunnels were trenches that contained a covered tunnel. First the trench walls were outlined, and then dug. As workers dug, they diverted the leftover debris that popped up. The debris was then thrown away, and the tunnel walls were braced. The workers built a drainage pipe under the tunnel to divert water from the electrified third rail. After the tunnel was completed, workers filled the trench with cement and sealed the tunnel.

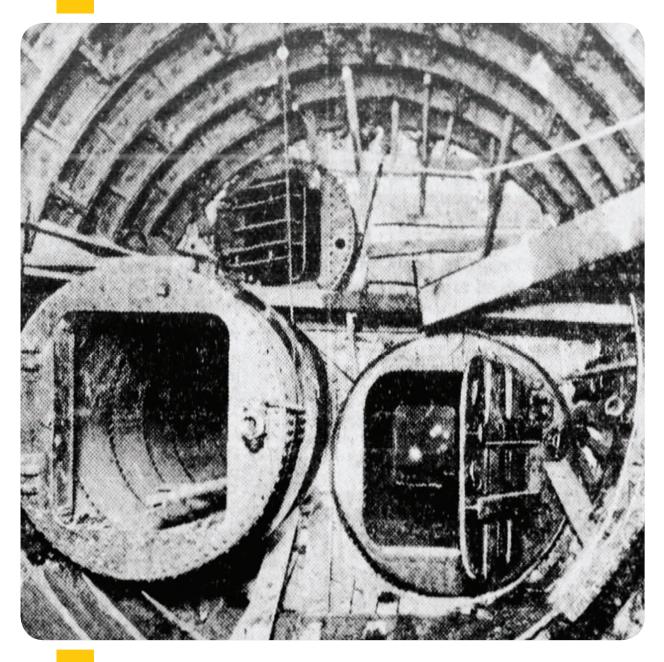
Some sandhogs dug holes, others placed metal pieces on the walls and ceiling to stop the cave from collapsing. Then, while the tunnel was dug further and more pieces were placed inside of the tunnel, the other sandhogs were stabilizing the tunnel walls. To stabilize and put on the ceiling pieces, sandhogs placed a platform on the lower pieces and climbed up a ladder to get on top of the platforms to work. The three groups—the digging group, the iron group, and the stabilizing group—were constantly moving forward. The digging group kept on digging further, the iron group put the pieces on the available spots, and the stabilizing group stabilized every piece while moving the platform and ladder along with them.

As they went underground, they used caissons, made of metal or wood, to keep the tunnels in place. They filled the caissons with pressurized air and secured them by covering them to prevent the pressurized air from coming out. Once the caissons were placed underground, the sandhogs then rebuilt the street above ground.



Sandhogs worked together like family because their jobs were very dangerous. They got paid \$2 a day.³ Sandhogs were mostly Irish immigrants.

³ Paul E. Delaney, Sandhogs: A History of the Tunnel Workers of New York (New York: Compressed Air and Free Air, Shaft, Tunnel, Foundation, Caisson, Subway, Cofferdam, Sewer Construction Workers of New York & New Jersey & Vicinity, 1983).



Cylindrical chambers where sandhogs passed time to adjust to the air pressure. "Where Tube Diggers Play Poker." *The Brooklyn Daily Eagle* (Brooklyn, New York), February 1, 1929.

Fourteen New York subway tunnels were also built under rivers. For each one, a "pathway" was built up and the river had other sandhogs clearing the surface with dynamite and shovels to build a pathway down. Then, the sandhogs separated the tunnel from the river with blockades called shields that kept the water from entering the tunnel. Before they could begin each work shift, the sandhogs had to spend time in the airlock before they could go into the tunnel, and returned to the airlock before going back outdoors.

Because many waterways separate New York's boroughs from each other and from New Jersey, sandhogs have been very important in the history of New York transportation for 150 years. In 1869, work started on the Brooklyn Bridge and in 1873 construction began on the first Hudson River railroad tunnels. Because engineering technology was a brand-new field, the Brooklyn Bridge did not open until 1883. The Hudson River tunnels, today's Port Authority Trans-Hudson train system, did not open until 1908 because it was such a complicated project. Ever since, sandhogs have played key roles in the construction of dozens of tunnel and bridge projects in New York to this very day!

New York subways have 14 underwater tunnels that connect the boroughs with each other. Thirteen tunnels connect Manhattan with The Bronx, Queens, and Brooklyn; one connects Brooklyn and Queens.

Bridge and tunnel construction work requires the use of compressed air to keep water out of the tunnels and bridge foundations so that sandhogs can safely work underground. Sandhog work is dangerous and dirty, and the workers can only work limited hours in compressed air, or else they can get decompression sickness ("the bends"), which is very painful and can be fatal. Before beginning a work shift, and afterward, sandhogs must sit in a room called an air lock where the air pressure is gradually changed between the normal outdoor level and compressed level to ensure that they do not catch "the bends."

Marshall Mabey, the Sandhog Who Survived



A sandhog.
Courtesy of New York Transit Museum.



arshall Mabey was a sandhog who worked for the BRT building today's Montague Street tunnels.

One time while he was working underwater, there was a crack in the caisson, and the pressurized air went rushing through the crack! Marshall Mabey and his partner tried to stop this and felt the air pressure push them back into the tunnel. He was squeezed through the tunnel walls and got shot up 12 feet in the air into the East River over the riverbed! The pressurized air came through with a force powerful enough to create a geyser.

Marshall Mabey was the only sandhog to survive the big accident, called a blowout. He was taken to the Brooklyn City Hospital and was hospitalized for three days. He went back to work right away!

"I am a good swimmer and I kept my mouth shut and came up to the surface. I had on my big rubber boots and they bothered me but I managed somehow to keep my head above the surface. My left leg was numb but I could move it. Finally men on a pier threw me a rope and I held on until I was taken out of the water." — Marshall Mabey.⁴

Mabey was 28 years old when he experienced the accident and had a wife and four children. He continued to work for 25 more years!⁵



Marshall Mabey lived on 89 Theodore Street in Long Island City.6

Sandhogs sometimes experienced a horrible sickness called the bends, or caisson's disease. This was created when the pressurized air from air locks spread through their veins if they came back aboveground quickly. The regular air would mix in with the pressurized air in their veins and it created air bubbles in their bloodstream.⁷

^{4 &}quot;Tells How It Feels to Go Up In A Geyser." *The New York Times*, February 21, 1916, https://www.nycsubway.org/wiki/Tells_How_It_Feels_to_Go_Up_In_A_Geyser_(1916).

⁵ Adam Fifield, "The Underground Men," The New York Times, January 12, 2003, https://www.nytimes.com/2003/01/12/nyregion/the-underground-men.html.

^{6 &}quot;Tells How It Feels to Go Up In A Geyser," The New York Times, February 21, 1916.

⁷ Delaney, Sandhogs: A History of the Tunnel Workers of New York.

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Conductors on BRT Elevated Trains



Most women quit working on public transportation after the wars ended. Courtesy of New York Transit Museum.



hen trains left the station, they had a motorman, a conductor, and guards. The motorman drove the train, and the conductor was in charge of the train and made sure it ran smoothly. They went between the first and second cars. There were guards stationed in the rest of the train. They opened the gates where passengers got off and on the train.

When the BRT used steam-powered trains and wooden cars, train conductors rang a bell to tell the passengers that the train was arriving or, if it was already at a stop, that it was leaving. The guards used hand signals or bells to let the conductor know it was safe for the train to leave the station. The conductors would wave a flag to the motorman to show that it was safe to leave.

On the older wooden trains, the bells were between the cars, in a chamber with a window, a seat, and a locked wooden door. The conductors would unlock the door, sit inside the chamber, and watch the passengers. Then they would come out, lock the door, and inspect the rest of the train either standing up or sitting in other train cars. If the bell needed to be rung but the conductor was in a train car, he could just pull a string that was connected to the bell so the bell would ring.

Presenting the Conductorettes



Women working for the Long Island Railroad.

Women trainmen of the Long Island Railroad studying the bulletin board in the office of the crew dispatcher to get their train orders, 1943, safety film negatives, Farm Security Administration, Office of War Information photograph collection, LC-USW3-034170-C; Library of Congress Prints and Photographs Division.



he BRT was the first company to hire women workers as conductorettes.

Conductorettes were hired during World War I, when most men were off serving in the armed forces.

The LIRR (Long Island Railroad) were the second to do this, decades later during World War II.⁸ Women operated the trolleys and buses for the BMT during World War II, when the BMT was owned by the city.

A conductorette's job was the same as a male conductor's. There were many roles. They opened and closed the doors, let people on and off the train safely, made sure the train was lined up correctly in a station, and made general announcements that included the next stop on a train.





Technologyof the BRT

Steam Engines



A steam engine powered elevated train.

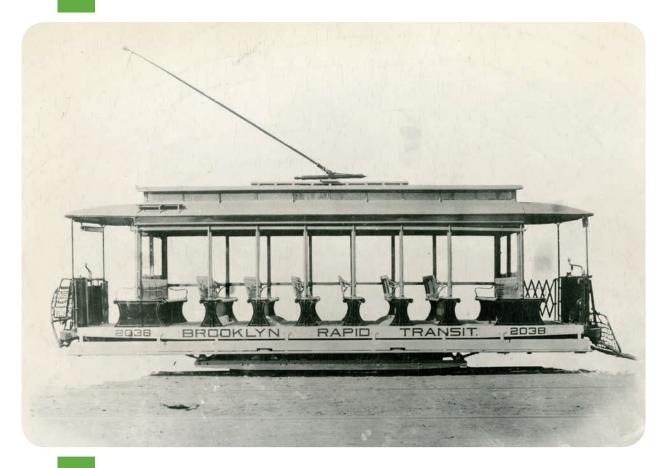
Courtesy of New York Transit Museum.



efore 1900, steam engines pulled elevated trains because they were

not using electricity. The trains were originally steam locomotives. They used coal to make the steam. This caused air pollution. Black smoke would come out of the stack of the train, and it smelled gross. Yuck! Breathing it was not good for New Yorkers' health. Also, the sound of steam coming out of the stack was *loud*. This made noise pollution. This stopped after 1900, when electricity powered elevated trains.

Trolleys





he BRT company operated streetcars known as trolleys! They were called trolleys because of the pole and wheel used to pick up electric power from overhead wires. They had their own tracks in the middle of the streets. One trolley route was the Coney Island Avenue line that connected Prospect Park with Coney Island.

However, trolleys were dangerous. Why? Because there was traffic. Trolleys were riding on the same lines as other forms of transportation: omnibuses, horsecars, and carriages. This caused gridlock. Brooklynites used to play a game of dodging the trolleys because they didn't pull up to the curb like buses do today.

Trolleys would also get too crowded and could not hold as many people. They did some critical damage because of accidents, gridlock, and congestion.

Trolleys stopped in the middle of the street, which was also a safety hazard.

Mayor Fiorello La Guardia believed buses were better than trolleys, because buses could pull up to the side of the curb to drop off and pick up people at their stops. Bus routes could also be changed easily, without requiring new tracks and overhead wires.

Trolleys ended in NYC because buses began to replace trolleys in 1941. The last Brooklyn trolley line, B-35 Church Avenue, was replaced for good by buses in 1956.



Trolleys used the same streets as all of New York City's transportation. This caused trolley traffic. The trolleys would block the streets when they stopped and caused all other transportation to stop until they moved.

The Dodgers baseball team were originally from Brooklyn and called themselves the Trolley Dodgers! Later they became the Brooklyn Dodgers.

The Design of the BRT Elevated Trains



A BRT elevated train.
Courtesy of New York Transit Museum.



he elevated BRT trains that were used in Brooklyn for several decades were made out of wood bodies with iron and steel wheels and frames under

were made out of wood bodies with iron and steel wheels and frames under the car. Although the structure was strong, the wood could fail. This was proven in 1918 in the Malbone Street train crash.

(Please go to Chapter 13 to learn more about the Malbone Street Wreck.)

Inside there were seats made of rattan. Rattan is a plant that is similar to bamboo. Also cotton and springs were in the seats. Because of the material used in the seats, they would break easily. The seats were springy, so you could bounce on them, but they would have to be replaced all the time. The rattan sticking out of broken seats used to rip women's stockings! When something spilled, it would be hard to clean because the rattan would absorb it. Today seats on New York City's trains are made out of hard plastic because they are easier to clean and don't break as much. Also, they can't be damaged anymore with knives or box cutters!

On the train, it was humid because there were no fans. In the summer, the straps people held got very sweaty, and sweat would drip on the seat and people's bodies would stick to the rattan seats. Straps would rip because the material was weak. They were made out of canvas and leather.

The BRT Standard Subway Train Car



Women worked as subway guards during World War I.
Bain News Service, Brooklyn Subway Guards, 1917, glass negative,
LC-B2- 4377-12; Library of Congress Prints and Photographs Division.



he Standard train car, also known as the AB Standard, BRT Standard, or BMT Standard, was modeled after the Boston Elevated Railway cars. The Standards were made by the American Steel Company and the Pressed Steel Company. The BRT Standards were 10 feet wide and 67 feet long. The BRT and BMT ordered 950 standards between 1914 and 1924. They originally ordered 945, and 5 were destroyed so they ordered 5 more to replace them.

The Standard was an improvement because BRT elevated trains were made of wood and had only two doors on each side to let passengers on. The Standard was made of steel with a total of six doors, three on each side.

There were ceiling fans that would get power from the third rail (600 volts of electricity), but sometimes they would stop working.



Passengers were fined \$500 if they spit on trains!9

The BRT Turnstile, the Windmill





o go on a train, passengers had to go through a machine called the

Windmill. The passengers bought tickets, and the ticket collector collected them. If the ticket collector thought the ticket was real, he pressed a foot pedal that turned the windmill and let the passenger through. Some people would use a fake ticket to get past. That was called using counterfeit tickets, or fare evasion. To tighten security, the BRT changed the wood parts to metal. Then, the ticket collector could pull a rope that turned a lever that pushed the foot pedal.

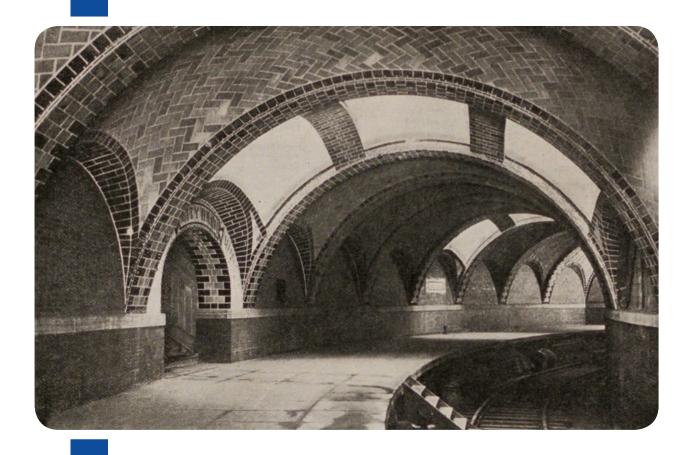






The BRT Versus the IRT

Sizeable Differences: the BRT Versus IRT



The City Hall subway station was part of the IRT.

Eugene L.Armbruster, City Hall Subway Station, circa 1905, Eugene L.Armbruster photographs and scrapbooks, V1974.022.10.236; Brooklyn Historical Society.



he BRT and the IRT were competing against each other. This is because the IRT was the first train company to have a subway line. It opened on October 27, 1904.¹⁰ The BRT's first subway station opened on September 16, 1908, at Essex Street in Manhattan, but it was not until 1915 that the BRT began full subway service between Manhattan and Brooklyn. The two subway companies wanted to be better than each other.



The IRT tunnels and trains were based on their earlier Manhattan elevated-train dimensions. The IRT built their tunnels smaller because they only wanted their trains in their tunnels. Because of crowding on the IRT trains, the BRT designed its tunnels and subway cars to handle bigger cars than the IRT, to allow more people to ride.

Originally to get on the IRT subway trains you would have to pay 5 cents. You would also have to pay 5 cents to get on the BRT trains. To transfer between the BRT and the IRT, you would have to pay double! The double fare continued until 1948, when free transfers began between the IRT and BMT (former BRT) routes. But in 1948 the fare was doubled to 10 cents!¹¹

^{10 &}quot;New York City Transit—History and Chronology," Metropolitan Transportation Authority, accessed March 13, 2019, http://web.mta.info/nyct/facts/ffhist.htm.

CHAPTER 12

The Standard Versus the Hi-V/Lo-V





he BRT Standard cars had more space than IRT cars. BRT Standards were 10 feet wide and 67 feet long. IRT cars, called the High Voltage (Hi-V) and Low Voltage (Lo-V), were just 9 feet wide and 51 feet long, with 42 to 44 seats. The Standard had 78 seats, plus 14 auxiliary seats. Both cars had six doors (3 per side), but the BRT car doors were wider than the IRT. The BRT trains had more room and more seats than the IRT trains.



Drop down auxiliary seats were dangerous on the Standard because they blocked the conductor's view when opening and closing doors on BRT trains!

HISTORIAN'S NOTE IRT subway cars, both High Voltage (Hi-V) and Low Voltage (Lo-V), were the same size and looked alike. Hi-Vs were the first IRT subway cars built, in 1904. The difference is due to the electric circuits used in the train's controls. Hi-V car controls used 600 volts DC from the third rail to operate, which placed the train's motorman and conductor at risk of electrical shock from stray current. Low-V cars were developed around 1914 and used control circuits of much lower voltage (32 volts), fed from batteries that were recharged from the third rail. The Low-V car was much safer because it greatly reduced the hazard of employees coming into contact with 600 lethal volts of electricity! The traction motors (which provide power to move the train) on both Hi-V and Low-V cars took their power from the third rail directly. That is still the case today.





The Deadliest Subway Accident in New York City

CHAPTER 13

The Malbone Street Wreck



An article from \textit{The Brooklyn Daily Eagle} the day after the wreck.

"Photos Show How Cars, Hurled With Great Force Against Tunnel Wall, Were Reduced to a Jumbled Mass of Splinters and Twisted Iron," *The Brooklyn Daily Eagle*, November 2, 1918, 3.



he Malbone Street Wreck was the deadliest crash in the subway's

history. A new train station, Prospect Park, was opened on September 25, 1918. The crash occurred on November 1, 1918, just north of the Prospect Park station on today's Q train (Brighton Line). The Brighton Line was being rebuilt at that time for subway service using the new Standard cars, which would replace the older wooden elevated cars in use in 1918.

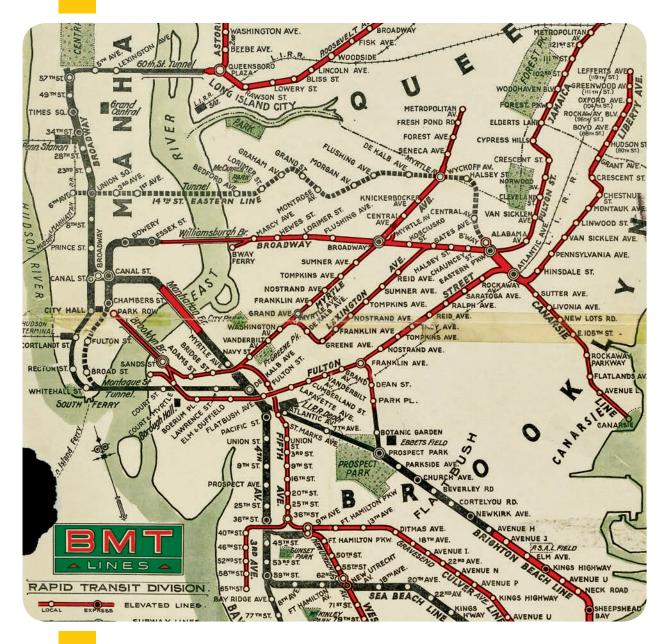
The BRT was struggling to maintain service because many of its motormen, the people who drove the train and who connected the train cars safely, were on strike. They had joined a union called the Brotherhood of Locomotive Engineers. When they tried to negotiate, the company did not agree to their demands. The motormen continued to strike. The BRT did not have enough motormen and quickly trained other workers to drive the trains. On November 1, 1918, they had a train dispatcher drive a train, which was mostly made out of wood, with less than a day of experience instead of just shutting down the train service.

Edward Luciano was a young dispatcher sent to drive on the Brighton Beach line. He was driving a five-car, 650-passenger train. They gave him less than one day of training! On November 1, 1918, at approximately 6:42 p.m., he was driving the train at about 30 miles per hour. The tunnel in the new station had a tight S shape, and motormen were to go only 6 miles per hour. He was going over the speed limit. Because of this, the train derailed and crashed into a wall, killing 93 people. Edward ran away from the crash. This made him look suspicious. Edward was arrested and sent to the police station because he had fled the scene. Eventually, he and other BRT employees were put on trial in criminal court, but no one was convicted. After that, families of the victims sued the BRT in civil court and were able to collect money as a result of their losses. The court did not know who to blame.

Some people said Luciano was responsible, and most said various people who managed the BRT were responsible. The court realized that the BRT had really forced him to drive when he wasn't prepared. Did that work? No. It was really confusing and hard to blame anyone. In the end, no one was blamed! Luciano left his job at the BRT, changed his name, and moved away from Brooklyn. What he did for the rest of his life is not known.

CHAPTER 14

Conclusion





fter the Malbone Street wreck, wooden cars were banned from underground subway tunnels. Many of the wooden cars remained in use on elevated lines in Brooklyn for several decades. Some of these trains took passengers to the 1939 World's Fair in Flushing Meadows, Queens. The cars were blue and orange, the colors of the World's Fair. Some were still on the tracks in 1969 and were retired when the Myrtle Avenue Elevated closed.

The Malbone Street crash hurt the BRT's popularity, so the company decided to change the name to the BMT (Brooklyn Manhattan Transit) in 1923. They hoped the name change would make people feel comfortable about riding their train line.



Malbone Street, located in Flatbush, was changed to Empire Boulevard just after the accident happened. Today, the Franklin Avenue Shuttle passes through the Malbone Street tunnel to arrive at the Prospect Park station on the B and Q lines.

Another reason the BRT changed its' name to the BMT line, is they had to reorganize their finances because they were given more lines to manage.

The BMT, along with the IRT, was taken over by the New York City Board of Transportation in 1940, after these companies lost a lot of money because of the 5 cent fare law. This law, created in 1913, stopped private companies from raising the fare to more than 5 cents so that it would stay affordable for all passengers. Because of inflation, both the BMT and IRT were not making enough money anymore to stay open.¹²

All of New York City's transportation system joined the New York State owned MTA (Metropolitan Transportation Authority) on March 1, 1968.

^{12 &}quot;New York City Transit—History and Chronology," Metropolitan Transportation Authority, accessed March 13, 2019, http://web.mta.info/nyct/facts/ffhist.htm.

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air locks

an intermediate chamber with two airtight doors or openings to permit passage between two dissimilar spaces.

air pollution

toxins released into the air that are harmful or dangerous for the environment.

auxiliary seat

an extra drop down seat that can be used by passengers.

blowout

a bursting of a container (such as a tire) by pressure of the contents on a weak spot.

caisson

a watertight chamber used in construction work under water or as a foundation.

canvas

a firm closely woven cloth usually of linen, hemp, or cotton.

carriage

a horse-drawn vehicle designed for private use and comfort.

debris

the remains of something broken down or destroyed and an accumulation of fragments of rock.

elevated

raised especially above the ground or other surface.

elevated train

trains raised above the ground.

fare evasion

passengers illegal attempt to avoid paying for the subway fare.

gridlock

a traffic jam in which a grid of intersecting streets is so completely congested that no vehicular movement is possible.

hard plastic

made or consisting of plastic.

horsecar

a streetcar drawn by horses.

immigrant

a person who comes from another country to take up permanent residence in a new country.

inflation

more money is needed to pay for items on sale.

leather

material made out of animal skin.

motorman

the driver who operates a motor-driven vehicle (such as a streetcar or subway train).

negotiate

to arrange for or bring about through conference, discussion, and compromise.

noise pollution

loud noises that can be harmful for hearing.

omnibus

horse drawn buses used for public transportation in New York City during the 19th Century.

rattan

the thin stems of a palm tree, used to make furniture.

sandhog

a laborer who works in underwater or underground excavation and construction (such as in the building of tunnels or bridge foundations).

skepticism

an attitude of doubt expressed either in general or toward a particular object.

stabilize

to make stable, steadfast, or firm.

steam engine

machine using steam power to perform mechanical work through burning coal.

third rail

a metal rail through which an electric current is led to the motors of an electric vehicle (such as a subway car).

train dispatcher

a railroad employee who directs the movement of trains within a division and coordinates their movement from one division to another.

transportation

the movement by a carrier of either people, goods, or products from one location to another.

trench

a long cut in the ground.

trolley

a streetcar powered electrically.

trolley traffic

traffic caused by trolleys resulting in street jams.

union

a club, society, or association formed by people with a common interest or purpose.

world's fair

large international exhibition of a wide variety of industrial, scientific, and cultural items that are on display at a specific site for a period of time.

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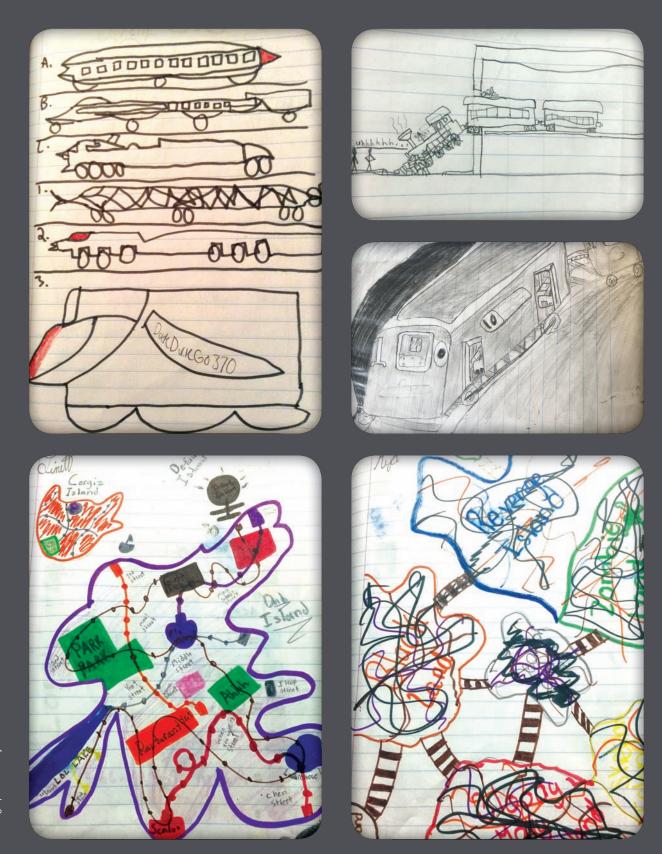
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