= Second Avenue Subway =

The Second Avenue Subway (officially the IND Second Avenue Line ; abbreviated to SAS) is a future New York City Subway line that has been under discussion for almost a century . The line will run primarily under Second Avenue on the East Side of Manhattan . A first phase of this new line is expected to open on December 30 , 2016 , having been under construction since 2007 . It will run between 96th Street and Second Avenue and the existing 63rd Street Lines , where it will connect to the BMT Broadway Line and the rest of the subway system . The Q train will provide full @-@ time service on phase one and will serve about 200 @,@ 000 daily riders . The full line , when funded , will be built in three additional phases , allowing portions of the line to open before the entire line is completed . When complete , it will be served by a proposed T train and is projected to serve about 560 @,@ 000 daily riders . The full proposed Second Avenue line would consist of 16 stations and 8 @.@ 5 miles (13 @.@ 7 km) of tunnel , and is expected to cost over $ 17 billion .

The line was originally proposed in 1919 as part of a massive expansion of what would become the Independent Subway System (IND) . Work on the line never commenced , as the Great Depression crushed the economy . Numerous plans for the Second Avenue Subway appeared throughout the 20th century , but these were usually deferred due to lack of funds . In anticipation of the never @-@ built new subway line , the Second and Third Avenue elevated lines were demolished in 1942 and 1955 , respectively . This left the Lexington Avenue Subway as the only rapid transit line on much of Manhattan 's east side ; today , it is by far the busiest subway line in the United States with an estimated 1 @.@ 3 million daily riders .

Construction on the Second Avenue line started in 1972 , but was halted in 1975 because of the city 's major fiscal crisis ; only a few small segments of the line were completed at the time . Simultaneously , construction work on the 63rd Street Lines , which would connect the Second Avenue Line and the IND Queens Boulevard Line to the BMT Broadway Line and the IND Sixth Avenue Line , started in 1969 . Work on the 63rd Street line continued even after construction on the Second Avenue line ended . The first segment of the 63rd Street Lines ? which opened in October 1989 and extended to 21st Street ? Queensbridge in Long Island City , Queens ? left provisions for future construction to the Second Avenue Line .

Construction restarted in 2007 following the development of a financially secure construction plan . The Metropolitan Transportation Authority (MTA) awarded a tunneling contract for the first phase of the project to the consortium of Schiavone / Shea / Skanska (S3) on March 20 , 2007 . This followed preliminary engineering and a final tunnel design completed by a joint venture between AECOM and Arup . Parsons Brinckerhoff is serving as the Construction Manager of the project . A full funding grant agreement with the Federal Transit Administration for the first phase of the project was received in November 2007 . A ceremonial ground @-@ breaking for the Second Avenue Subway was held on April 12 , 2007 . The first phase of the line consists of three new stations and two miles (3 @.@ 2 km) of tunnel , costing $ 4 @.@ 45 billion . The contractor prepared the initial construction site at 96th Street on April 23 , 2007 . The tunnel boring machine launch box was completed in May 2010 , and on May 14 , MTA 's contractors completed the TBM installation and turned it on . On March 28 , 2011 , S3 , having completed the west tunnel to 65th Street , began drilling for the east tunnel , which completed its run to the Lexington Avenue ? 63rd Street station 's bellmouth on September 22 , 2011 . As of July 1 , 2016 , the first phase was 96 @.@ 3 % complete .

= = Initial attempts = =

From 1919 through the 1980s , several different entities came up with many distinct plans for the Second Avenue subway line that were never carried out . The complex reasons for these delays are why the line is sometimes called " The Line That Time Forgot " .

= = = 1919 ? 41 : Initial planning = = =

After World War I , the New York City Subway experienced a surge in ridership . By 1920 , 1 @.@ 3 billion annual passengers were riding the subway , compared to 523 million annual riders just seven years before the war . In 1919 , the New York Public Service Commission launched a study at the behest of engineer Daniel L. Turner to determine what improvements were needed in the city 's public transport system . Turner 's final paper , titled Proposed Comprehensive Rapid Transit System , was a massive plan calling for new routes under almost every north @-@ south Manhattan avenue , extensions to lines in Brooklyn and Queens , and several crossings of the Narrows to Staten Island . Massively scaled @-@ down versions of some of Turner 's plans were found in proposals for the new city @-@ owned Independent Subway System (IND) . Among the plans was a massive trunk line under Second Avenue consisting of at least six tracks and numerous branches throughout Brooklyn , Queens , and the Bronx . Turner also proposed that the two elevated lines be knocked down to make room for the 6 @-@ track Second Avenue Subway . The plan was to connect the new line to the then @-@ unbuilt Sixth Avenue and Eighth Avenue subway lines .

In January 1927 , Turner submitted a revised proposal . It was now going to connect to a Tenth Avenue trunk line as well as to crosstown lines in the Bronx and Queens . The Second Avenue Subway was still a six @-@ track line through Manhattan , except for a short eight @-@ track tunnel at its junction with the Queens lines . The plan called for a connection to the IND Concourse Line in the Bronx , as well as another one to the IND Fulton Street Line in Brooklyn . Such a plan would have cost $ 165 @,@ 000 @,@ 000 (equivalent to $ 2 @,@ 248 @,@ 000 @,@ 000 in 2015) , including connections and underwater crossings . As the IRT Lexington Avenue Line got more crowded , some suggested ideas that were considered unusual . One suggestion included a new tunnel under Lexington Avenue , while another included a tunnel under a separate right @-@ of @-@ way between Second and Third Avenue .

In 1929 , the Board of Transportation of the City of New York tentatively approved the expansion , which included a Second Avenue Line with a projected construction cost of $ 98 @,@ 900 @,@ 000 (equivalent to $ 1 @,@ 351 @,@ 000 @,@ 000 in 2015) , not counting land acquisition . From north to south , the 1929 plan included four tracks from the Harlem River (where it would continue north as a Bronx trunk line with several branches) to 125th Street , six tracks from 125th Street to a link with the Sixth Avenue Line at 61st Street , four tracks from 61st Street to Chambers Street , and two tracks from Chambers Street to Pine Street . The plan was soon modified with the addition of another Bronx branch , as well as an extension of the subway to Water and Wall Streets . At the time , it was supposed to be completed between 1938 and 1941 . In anticipation of the line 's opening , real estate prices along the proposed route rose by an average of 50 % .

Due to the Great Depression , the soaring costs of the expansion became unmanageable . Construction on the first phase of the IND was already behind schedule , and the city and state were no longer able to provide funding . By 1930 , the line was shortened to between 125th and 34th Streets , with a turnoff at 34th Street and a crosstown connection there ; this line was to be complete by 1948 . The line above 32nd Street was to start construction in 1931 , with construction of a southern extension to Houston Street to commence in 1935 ; these segments would open in 1937 and 1940 , respectively . This scaled @-@ down plan was postponed in 1931 . By 1932 , the Board of Transportation had come up with another plan , which omitted a branch in the Bronx in order to cut costs . The new line 's southern terminus would be truncated to the Nassau Street Loop .

Further revision of the plan and more studies followed . By 1939 , construction had been postponed indefinitely , and Second Avenue line was relegated to " proposed " status , and was number 14 on the Board of Transportation 's list of important transportation projects . The Second Avenue line was also cut to two tracks , but now had a connection to the BMT Broadway Line . The reduced plan now had a single northern branch through Throggs Neck , Bronx , and a branch south into Brooklyn , connecting to a stub of the IND Fulton Street Line at the Court Street station , which is now the site of the New York Transit Museum . The subway was now also US $ 249 million (equivalent to $ 4 @,@ 006 @,@ 000 @,@ 000 in 2015) . The United States ' entry into World War II in 1941 halted all but the most urgent public works projects , delaying the Second Avenue Line once again .

= = = 1940s ? 50s : After World War II = = =

As part of the unification of the three subway companies that comprised the New York City Subway , elevated lines were being shut down all over the city and replaced by subways , continuing the IND 's trend of phasing out elevated lines and streetcars in favor of new subways . For example , the IND Sixth Avenue Line replaced the Sixth Avenue Elevated , while the IND Fulton Street Line replaced the Fulton Street Elevated . Demolition of the elevateds also had the perceived effect of revitalizing the neighborhoods . The northern half of the Second Avenue Elevated , serving the Upper East Side and East Harlem closed in 1940 ; the southern half , running through Lower Manhattan , East Midtown and across the Queensborough Bridge to Queens , closed on June 13 , 1942 . The demolition of the Second Avenue elevated caused overcrowding on the Astoria and Flushing Lines in Queens , which no longer had direct service along Manhattan 's far East Side . Because of the elevated line 's closure , as well as a corresponding increase in the East Side population , the need for a Second Avenue subway increased .

In 1944 , Mayor Fiorello H. La Guardia announced that work on the Second Avenue subway line was progressing . The same year , BOT superintendent Philip E. Pheifer came up with a map of train frequencies for the line , with about 56 trains per hour projected to go through the Second Avenue line . Pheifer also put forth a proposal for Second Avenue Subway services , which would branch extensively off to B Division lines , including the IND Sixth Avenue Line , BMT Broadway Line , and BMT Nassau Street Line , via pre @-@ existing BMT trackage over the Manhattan and Williamsburg Bridges . From Canal Street to 57th Street the line was to be four tracks , with six tracks north of 57th Street . South of Canal Street there would be two tracks . The subway was to be opened by 1951 . In addition , a new Bronx Branch would replace the Third Avenue El in the Bronx . By 1945 , though , plans for the Second Avenue Subway were again revised . The southern two @-@ track portion was abandoned as a possible future plan for connecting the line to Brooklyn , through a Bronx route to Throggs Neck was put forth .

Under Mayor William O 'Dwyer and General Charles P. Gross , another plan was put forth in 1947 by Colonel Sidney H. Bingham , a city planner and former Interborough Rapid Transit Company (IRT) engineer . O 'Dwyer and Gross believed that construction of a Second Avenue subway line would be vital to both increasing capacity on existing lines and allowing new branch lines to be built . This plan would again connect the Second Avenue Line to Brooklyn . As with Pheifer 's proposal , a train frequency map was created ; however , Bingham 's proposal involved more branch lines and track connections . A connection to Brooklyn was to be made via the Manhattan and Williamsburg Bridge , and would allow trains from these bridges to go onto the Sixth Avenue Line or the Second Avenue Line . Other connections to the Second Avenue Line were to be provided at 57th Street , via a line connecting to the Sixth Avenue Line ; two express tracks would be built along that line north of West Fourth Street . The IRT Pelham Line would be switched to the combined IND / BMT division (this plan also includes other connections , which have been built) , and connected to the Second Avenue Line . The Second Avenue Line would end just north of that connection , at 149th Street , with transfers to the IRT White Plains Road Line and the elevated IRT Third Avenue Line , the latter of which would be demolished south of 149th Street . There would also be a connection to the IND Concourse Line . The line was to be built in sections . The Manhattan section was top @-@ priority , but the Brooklyn section was 19th on the priority list , and the Bronx section did not have a specific priority .

By the next year , New York City had budget shortfalls . The City was short of $ 145 million (in 1948 dollars) that were needed for rehabilitation and proposed capital improvements , which cost a total of $ 800 million . The City petitioned the New York State Legislature to exceed its $ 655 million debt ceiling so that the city could spend $ 500 million on subway construction , but this request was denied .

The New York Board of Transportation ordered ten new prototype subway cars made of stainless steel from the Budd Company . These R11 cars , so called because of their contract number , were delivered in 1949 and specifically intended for the Second Avenue Subway . They cost US $ 100 @,@ 000 (equivalent to $ 1 @,@ 000 @,@ 000 in 2015) each ; the train became known as the " million dollar train " . The cars featured porthole style round windows and a new public address

system . Reflecting public health concerns of the day , especially regarding polio , the R11 cars were equipped with electrostatic air filters and ultraviolet lamps in their ventilation systems to kill germs .

By 1949 , Queens and Lower Manhattan residents complained that the Second Avenue Subway would not create better transit options for them . A year later , revised plans called for a connection from Second Avenue at 76th Street to Queens , under 34th Avenue and Northern Boulevard , via a new tunnel under the East River . Connections would also be made to the Long Island Rail Road (LIRR) ' s Rockaway Beach Branch . New York voters approved a bond measure for its construction in 1951 , and the city was barely able to raise the requisite $ 559 million for the construction effort . However , the onset of the Korean War caused soaring prices for construction materials and saw the beginning of massive inflation . Money from the 1951 bond measure was diverted to buy new cars , lengthen platforms , and maintain other parts of the aging New York City Subway system . Out of a half @-@ billion @-@ dollar bond measure , only $ 112 million (equivalent to $ 1 @,@ 021 @,@ 000 @,@ 000 in 2015) , or 22 % of the original amount , went toward the Second Avenue Subway . By then , construction was due to start by either 1952 or 1957 , with estimated completion by 1958 at the earliest . Because many people thought that the bonds were solely to be used on the new subway , many people accused the New York City Transit Authority (NYCTA) of misusing the bonds .

A block to the west of the proposed subway line , the Manhattan section of the Third Avenue Elevated , the only other elevated line in the area , closed on May 13 , 1955 , and was demolished in 1956 . Contrary to what many East Side residents thought , the demolition of the elevateds did not help the travel situation , as the Lexington Avenue Line was now the only subway transportation option on the East Side .

By 1957 , it had been made clear that the 1951 bond issue was not going to be able to pay for the Second Avenue Line . The money had been used for other projects , such as the integration of the IRT Dyre Avenue Line , and IND Rockaway Line , and reconfiguration of the DeKalb Avenue Interlocking . By then , the New York Times despaired of the line 's ever being built . In March of that year , NYCTA chairman Charles L. Patterson stated that the NYCTA had used the bond funds properly and that the bonds were not dedicated solely to fund the Second Avenue Line . He stated that the bonds had been allocated to the corridor based on increasing ridership on the Second Avenue Line , but admitted that currency inflation , as well as necessary rehabilitation work to the existing lines , made the Second Avenue Line unlikely in the near future .

= = = 1960s ? 1970s : Original construction efforts = = =

As the early 1960s progressed , the East Side experienced an increase in development , and the Lexington Avenue Line became overcrowded . In 1962 , construction began on a connection between the Manhattan and Williamsburg Bridges and the Sixth Avenue Line . This segment , the Chrystie Street Connection , was first proposed in the 1947 plan as the southern end of the Second Avenue line , which would feed into the two bridges . When opened in 1967 , the connection included a new station on the Sixth Avenue Line ? Grand Street (another station , 57th Street , opened in July 1968) ? and introduced the most significant service changes ever carried out in the subway 's history . Grand Street , located under Chrystie Street (the southern end of Second Avenue) was designed to include cross @-@ platform transfers between the Sixth Avenue and Second Avenue Lines . Although the connection only served Sixth Avenue Line trains , it was essentially the first part of the Second Avenue line constructed .

In 1964 , Congress passed the Urban Mass Transportation Act , promising federal money to fund mass transit projects in America 's cities via the Urban Mass Transportation Administration (UMTA) . Three years later , voters approved a $ 2 @.@ 5 billion (worth about $ 17 @,@ 742 @,@ 000 @,@ 000 in current dollars) Transportation Bond Issue , which provided over $ 600 million (worth $ 4 @,@ 258 @,@ 000 @,@ 000 today) for New York City projects , including for a 1968 Program for Action . The Second Avenue project , for a line from 34th Street to the Bronx , was given top priority . The City secured a $ 25 million UMTA grant for initial construction .

The Program for Action proposed a Second Avenue line to be built in two phases : The first phase

would start from 34th Street in Midtown , running up Second Avenue to 126th Street and continuing to the Bronx , with stops planned at 34th , 48th , 57th , 86th , 106th , and 125th Streets . The 48th Street stop would connect to a planned Metropolitan Transportation Center at Third Avenue and 48th Street , which would contain a new east side terminal for the Long Island Rail Road . The line included older proposals for connections to the Sixth Avenue and Broadway lines in Midtown via a new crosstown line , which would now be located on 63rd Street . The BMT 63rd Street Line would also include a connection allowing Second Avenue line trains to run to Queens . In the Bronx , the line would run along East 138th Street , with a cross @-@ platform transfer to Lexington Avenue Line trains at Brook Avenue on the IRT Pelham Line , which would be reconfigured . After that , Second Avenue line trains would use a new express bypass line along East 138th Street , and the former tracks of the New York , Westchester and Boston Railway (NY & WB) near the Bruckner Expressway . In Hunts Point , service would split into two branches . One branch would continue to use former NY & WB trackage to East 180th Street , at which point the line would connect to the IRT Dyre Avenue Line . A second branch would connect to the IRT Pelham Line in the vicinity of Whitlock Avenue station , another element from earlier plans . The first branch would take over all service on the Dyre Avenue Line , offering cross @-@ platform transfers to IRT White Plains Road Line trains at East 180th Street station , which would also be reconfigured . The second branch would take over service on the upper portion of the Pelham Line , between Whitlock Avenue and Pelham Bay Park . All stations on the Dyre Avenue and upper Pelham Lines would have platforms shaved back to accommodate larger B Division trains .

The second phase of construction would extend the Second Avenue line south from 34th Street in Midtown to Lower Manhattan , with stations at 23rd , 14th , Houston and Grand Streets , Chatham Square , Pine / Wall Streets , and a terminal at Whitehall Street . Free transfers would be offered to existing lines at 14th Street , Houston Street and Whitehall Street , while Grand Street would be reconstructed . Pine @-@ Wall and Whitehall Street stations would both have four tracks (two platform levels with two tracks each) in order to increase the capacity of Whitehall Street terminal above 30 trains per hour , and to improve passenger flow . Also during this phase , service on the upper Pelham Line would be extended to Co @-@ op City , Bronx . A third branch of the Second Avenue line to replace the Third Avenue El in the Bronx would also be built , running adjacent to the right @-@ of @-@ way of Metro @-@ North ? s Harlem Line on Park Avenue .

The line 's planned stops in Manhattan , spaced farther apart than those on existing subway lines , proved controversial ; the Second Avenue line was criticized as a " rich man 's express , circumventing the Lower East Side with its complexes of high @-@ rise low- and middle @-@ income housing and slums in favor of a silk stocking route . ? People protested for almost a year over the lack of stations at 72nd and 96th Streets ; while a 72nd Street station was added in October 1970 , the 96th Street station was still not in the official plans , despite the proximity of the Metropolitan Hospital Center to the proposed station . In response to public outcry , the MTA announced the addition of a station at 96th Street in 1971 . The line ? s planned route on Second Avenue , Chrystie Street and the Bowery in the Lower East Side also drew criticism from citizens and officials . In January 1970 , the MTA issued a plan for a spur line , called the " cuphandle " , to serve the heart of the Lower East Side : branching off from the IND Sixth Avenue Line near the Second Avenue station , the spur would run east on Houston Street , turn north on Avenue C , and turn west on 14th Street , connecting to the BMT Canarsie Line .

Despite the controversy over the number of stops and route , a groundbreaking ceremony was held on October 27 , 1972 at Second Avenue and 103rd Street . Construction began shortly thereafter on what was to be the 99th ? 105th Streets segment , which was projected to cost $ 17 @.@ 48 million (worth about $ 98 @,@ 886 @,@ 000 today) . Construction costs for the entire line were pegged at $ 1 billion (about $ 5 @.@ 657 billion today) , and rose to $ 1 @.@ 3 billion (about $ 6 @.@ 93 billion today) a year later . On October 25 , 1973 , the line 's Chinatown segment commenced construction at Canal Street under the foot of the Manhattan Bridge ; this segment , between Canal and Pell Streets , was due to be completed by 1980 and was being built at a cost of $ 8 @.@ 3 million (equal to about $ 44 @,@ 244 @,@ 000 in current dollars) . Less than a year later , on July 25 , 1974 , construction for an East Village segment of the line started near Second Street ,

spanning between 2nd Street and 9th Street . Another contract , for a Midtown segment between 50th and 54th Streets , was awarded that year , but construction never commenced . In total , construction on the Second Avenue Line during the 1970s spanned over 27 blocks . A segment between 110th and 120th Streets in East Harlem was also completed at a cost of $ 34 @.@ 45 million (equivalent to $ 194 @,@ 888 @,@ 000 in 2015) .

However , the city soon experienced its most dire fiscal crisis yet , due to the stagnant economy of the early 1970s , combined with the massive outflow of city residents to the suburbs . By 1974 , New York City mayor Abraham Beame was considering reallocating $ 5 @.@ 1 billion of funding from the Second Avenue Line to the existing infrastructure , which was rapidly deteriorating and in dire need of repair . In September 1975 , Beame issued a stop @-@ work order for the line . Construction of the line was halted , and no other funding was to be allocated to the line 's construction . Besides the Chrystie Street Connection , only three sections of tunnel had been completed ; these tunnels were sealed . By 1978 , when the New York City Subway was at its lowest point in its existence , State Comptroller Arthur Levitt stated that there were no plans to finish the line . During the 1980s , plans for the Second Avenue line stagnated . Construction on the 63rd Street Lines continued ; the IND portion of the line opened in 1989 , but it did not include a connection to the Second Avenue line . Of this failure to complete construction , Gene Russianoff , an advocate for subway riders since 1981 , stated : " It 's the most famous thing that 's never been built in New York City , so everyone is skeptical and rightly so . It 's much @-@ promised and never delivered . "

= = = = Segments completed in the 1970s = = = =

When construction on the line was halted in 1975 , three tunnel segments were completed : one from 99th to 105th Streets and a second from 110th to 120th Streets , both under Second Avenue in East Harlem , and a third from Pell to Canal Streets in Chinatown , under the Confucius Apartments complex next to the Bowery . They were not initially outfitted with track or signals . Over the next few decades , the MTA regularly inspected and maintained the tunnel segments (spending $ 20 @,@ 000 a year by the early 1990s) , to maintain the structural integrity of the streets above , and in case construction would ever resume . Trespassers would often camp in the tunnels until the MTA increased security .

The modern construction plan for the Second Avenue Subway , developed in 2004 , would make use of most of these tunnel segments . The first phase of service , which will reroute Q train service from the 60th Street Line (to Queens) to the BMT 63rd Street Line (and north to 96th Street) , would use the tunnel segment between 99th and 105th Streets for storage of up to four trainsets . By mid @-@ 2013 , work had resumed in this tunnel segment , involving the addition of track and signals , mechanical and plumbing equipment , and upgrading the tunnels to meet modern fire code standards . Phase 2 , which does not have a set timetable for construction , is planned to extend Q train service from 96th Street to 125th Street . During Phase 2 , both East Harlem segments will be connected , modified , and used for normal train service . In 2007 , the MTA reported that the segments were in pristine condition .

The fourth phase of construction will bring the Second Avenue line through Chinatown at an undetermined date . However , the tunnel under the Confucius Apartments is not planned to be used ; while original plans involved the Second Avenue line running at the same depth of the Sixth Avenue Line at the Grand Street station , that option would require the utilization of cut @-@ and @-@ cover construction methods , which would disrupt the community and require the demolition of several nearby structures . Instead the MTA has proposed a deeper tunnel alignment in this area , including a new lower level at Grand Street , to reduce construction impacts on the Chinatown community . As a result , trains will be unable to use this tunnel segment ; however , the MTA suggests that the tunnel segment could be used to store ancillary facilities for the subway line , such as a power substation or a ventilation facility .

Some construction work also took place between 2nd and 9th Streets , though the extent is disputed . Some reports say that only utilities were relocated , while others say that this section was excavated but later filled back in .

= = 2000s ? present : Construction and development = =

With the city 's economic and budgetary recovery in the 1990s , there was a revival of efforts to complete construction of the SAS . Rising ridership on the IRT Lexington Avenue Line , the only subway trunk line east of Central Park , demonstrated the need for the Second Avenue Line , as capacity and safety concerns rose . The four @-@ track IRT Lexington Avenue Line , the lone rapid transit option in the Upper East Side and East Harlem since the 1955 closure of the Third Avenue elevated , is the most crowded subway line in the country . The line sees an average of 1 @.@ 3 million daily riders , more than the entire Washington Metro system (which has the second @-@ highest ridership in the U.S.) and more than the rail transit systems of San Francisco and Boston combined . Local bus routes are just as crowded during various times of the day , with the surface Second Avenue Line , carrying the M15 and M15 SBS buses , seeing an annual ridership of 17 @.@ 5 million , or a daily ridership of about 47 @,@ 945 . The construction of the Second Avenue line would add another two tracks to fill the gap that has existed since the elevated Second and Third Avenue Lines were demolished in the 1950s .

= = = 1995 ? 2007 : Planning = = =

In the early 1990s , New York governor Mario Cuomo allocated $ 22 million to renew planning and design efforts for the Second Avenue line , but in 1993 the MTA , facing budget cuts , removed these funds from its capital budget . In 1995 , the MTA began its Manhattan East Side Alternatives (MESA) study , seeking ways to alleviate overcrowding on the Lexington Avenue Line and improve mobility on Manhattan 's East Side . The study analyzed several alternatives , such as improvements to the Lexington Avenue Line to increase capacity , enhanced bus service with dedicated lanes , and light rail or ferry service on the East Side . The favored alternative , build alternative 1 included a subway running down Second Avenue , from 125th Street in Harlem to the existing Lexington Avenue ? 63rd Street station with provisions for expansion to the Bronx and to Lower Manhattan . Build alternative two would involve the addition of a separate light rail service between Union Square and Broad Street that would serve the Lower East Side and Lower Manhattan . Due in part to strong public support , the MTA committed in 2000 to building a full @-@ length subway line along the East Side , from East Harlem to Lower Manhattan . In 2001 , a contract for subway design was awarded to DMJM Harris / Arup Joint Venture .

The MTA 's final environmental impact statement was approved in April 2004 ; this latest proposal is for a two @-@ track line from 125th Street and Lexington Avenue in Harlem , down Second Avenue to Hanover Square in the Financial District . The new subway line will actually carry two services . The full @-@ length Second Avenue line , extending from Harlem to the Financial District , is to be given the color turquoise and the letter designation T. However , a rerouted Q , the line 's other service , will begin carrying passengers first . The MTA plan calls for building the Second Avenue Subway in four segments with connections to other subway lines . The first segment (Phase One) is a proposed reroute of the Q , the Broadway Express via the BMT 63rd Street Line and north along Second Avenue to the Upper East Side at 96th Street . Phase Two will extend the rerouted Q train to 125th Street . In Phase Three , the new T train will run from 125th Street to Houston Street . The final phase will extend T train service from Houston Street to Hanover Square in Lower Manhattan . Track maps on the MTA 's website show that all stations , except for 125th Street , will have two tracks and one island platform . (72nd Street was conceived as a three @-@ track , two @-@ platform station , as is 125th Street . However , the 72nd Street station is being constructed with two tracks and one platform .)

In August 2006 , the MTA revealed that all future subway stations , including ones built for the Second Avenue subway , the 7 Subway Extension , and the new South Ferry station will be outfitted with air @-@ cooling systems to reduce the temperature along platforms by as much as 10 ° F (6 ° C) . The Second Avenue Subway was also to have platform screen doors to assist with air @-@ cooling and ventilation , but this plan was scrapped in 2012 as cost @-@ prohibitive .

The first phase will be within budget , at $ 4 @.@ 45 billion . The total cost of the 8 @.@ 5 @-@ mile (13 @.@ 7 km) line is expected to exceed $ 17 billion . According to MTA Capital Construction President Dr. Michael Horodniceanu , the whole line may be completed as early as 2029 and would serve 560 @,@ 000 daily passengers upon completion .

= = = 2007 ? present : First phase = = =

= = = = Construction = = = =

Second Avenue Subway plans for Phase 1 were only allowed to proceed because New York voters passed a transportation bond issue on November 8 , 2005 , allowing for dedicated funding allocated for that phase . Its passage had been seen as critical to its construction . After warning that failure to pass the act would doom the project , MTA chairman Peter S. Kalikow stated that " Now it 's up to us to complete the job " given its approval by a 55 ? 45 percent margin . In addition , the U.S. Department of Transportation announced , on December 18 , 2006 , that they would allow the MTA to commit up to $ 693 million in funds to begin construction of the Second Avenue Subway Line and that the federal share of such costs would be reimbursed with FTA transit funds , subject to appropriations and final labor certification .

The Phase 1 construction site was designated as being from 105th Street and Second Avenue to 63rd Street and Third Avenue . Deep bore tunneling methods were to be used in order to avoid the disruptions for road traffic , pedestrians , utilities and local businesses produced by cut @-@ and @-@ cover methods of past generations . Stations were to retain cut @-@ and @-@ cover construction .

Preliminary engineering and a final tunnel design was completed by a joint venture between AECOM and Arup . On March 20 , 2007 , upon completion of preliminary engineering , the MTA awarded a contract for constructing the tunnels between 92nd and 63rd Streets , a launch box for the tunnel boring machine (TBM) at 92nd to 95th Streets , and access shafts at 69th and 72nd Streets . This contract , valued at $ 337 million , was awarded to S3 , a joint venture of Schiavone Construction , Skanska USA Civil , and J.F. Shea Construction . A ceremonial groundbreaking took place on April 12 , 2007 , in a tunnel segment built in the 1970s at 99th Street . At the time , it was announced that passengers would be able to ride trains on the new line by the end of 2013 . Actual construction work began , on the surface of Second Avenue between 91st and 95th Streets , on April 23 , 2007 . Initial construction work involved moving utility pipes , wires , and other infrastructure , which took 14 months , far more than the MTA 's anticipated eight months . For boring , a trench was dug from 96th to 93rd Streets .

In November 2007 , Mary Peters , the United States Secretary of Transportation , announced that the Second Avenue Subway would receive $ 1 @.@ 3 billion in federal funding for the project 's first phase , to be funded over a seven @-@ year period . However , due to cost increases for construction materials and diesel fuel affecting the prices of contracts not yet signed , the MTA announced in June 2008 that certain features of the Second Avenue Subway would be simplified to save money . One set of changes , which significantly reduces the footprint of the subway in the vicinity of 72nd Street , is the alteration of the 72nd Street Station from a three @-@ track , two @-@ platform design to a two @-@ track , single island platform design , paired with a simplification of the connection to the Broadway Line spur . Supplemental environmental impact studies covering the changes for the proposed 72nd Street and 86th Street stations were completed in June 2009 .

On May 28 , 2009 , the MTA awarded a $ 303 @.@ 8 million contract to E.E. Cruz and Tully Construction Co . , a joint venture and limited liability company , to construct the 96th Street station box . Work began in July on site clearing and utility relocation necessary to prepare for the installation of slurry walls between 95th and 99th Streets where the station connects to the existing tunnel section . In June 2009 , the first of three contracts for the 86th Street station was awarded for the advance utility relocation work and construction of cut and cover shaft areas at 83rd and 86th Streets . This contract provided two vertical starter shafts that were used by a subsequent contractor

to excavate the station cavern in the rock between 83rd and 86th Streets .

During construction , two buildings had to be evacuated in June 2009 due to construction work . On June 5 , 2009 , an apartment building at 1772 Second Avenue was evacuated by the NYC Department of Buildings (DOB) after it was determined that the building was in danger of collapse . Then on June 29 , 2009 , the DOB evacuated a mixed use building at 1768 Second Avenue / 301 East 92nd Street because it too was in danger of collapse . The evacuation of these two buildings delayed the contractor 's plan to use controlled blasting to remove bedrock in the southern section of the launch box . Until the blasting permits could be issued , MTA required contractors to use mechanical equipment to remove the bedrock , which is slower than blasting out the rock .

The tunnel boring machine was originally expected to arrive six to eight months after construction began , but the utility relocation and excavation required to create its " launch box " delayed its deployment until May 2010 . On May 14 , 2010 , MTA 's contractors completed the TBM installation and turned it on at the Second Avenue Subway launch box at 96th Street and boring southward to connecting shafts built at 86th and 72nd Streets .

On October 1 , 2010 , MTA awarded a $ 431 million contract to joint venture SSK Constructors for the mining of the tunnels connecting the 72nd Street station to the existing Lexington Avenue ? 63rd Street station , and for the excavation and heavy civil structures of the 72nd Street station . A subsequent contract was awarded to Skanska Traylor Joint Venture for excavation of the cavern at the 86th Street station on August 4 , 2011 . In January 2011 , MTA awarded Judlau Contracting a 40 @-@ month , $ 176 @.@ 4 million contract to rebuild and enlarge the Lexington Avenue ? 63rd Street station .

Meanwhile , the tunnel boring machine dug at a rate of approximately 50 feet (15 m) per day . The machine finished its run at the planned endpoint under 65th Street on February 5 , 2011 . S3 partially disassembled the TBM and backed it out of the tunnel . It was repositioned in the east starter tunnel to begin boring again . Because the east side of Second Avenue has some soft ground not compatible with the Robbins TBM , ground @-@ freezing was undertaken to prepare the soil for the TBM . On March 28 , 2011 , S3 , having completed its task of completing the 7 @,@ 200 @-@ foot (2 @,@ 200 m) west tunnel to 65th Street , began drilling the east tunnel , with the first 200 feet (61 m) being through soil frozen by S3 using calcium chloride solution fed through a network of pipes . The TBM drilling the east tunnel will negotiate the curve onto 63rd Street and break through the bellmouth at the existing 63rd Street subway station . The portion of the west tunnel remaining to be created will be mined using conventional drill @-@ and @-@ blast methods , because the curve S3 construction teams would have to negotiate is too tight for the TBM . On September 22 , 2011 , the TBM completed its run to the Lexington Avenue ? 63rd Street station 's bellmouth .

The final contract , for architectural and mechanical and electrical work at 72nd , 86th , and 96th Street stations ; rehabilitation of the Lexington Avenue ? 63rd Street station ; and the Systems Contract (track , signals , and communications) for the entire Phase 1 area was awarded on June 1 , 2013 . On a July 2013 " report card " that indicated the progress of the subway by Congresswoman Carolyn Maloney , the construction progress got a " B " . Blasting for the station caverns was finished in November 2013 , and the muck houses were taken down at around the same time .

In the winter of 2013 , many of the tracks and signal panels began to arrive at the construction site , to be installed on the line over the next few years . It was reported in November 2013 that one third of the tracks for the line had arrived , for the segments of track between 87th and 105th Streets ; the tracks were being stored at 96th Street station . As of May 21 , 2015 , the first phase of construction was more than 80 % complete . By August 2015 , the construction project was 84 @.@ 3 % complete , with all 10 Phase 1 construction contracts having been awarded and 5 of them having been completed . As of July 1 , 2016 , the first phase was 96 @.@ 3 % complete .

= = = = Schedules for construction and planning = = = =

The MTA and its contractors on the project meet on a regular basis with the Manhattan Community Board 8 Second Avenue Subway Task Force and Manhattan Community Board 11 to report on

construction progress and to seek input from the community .

The MTA 's forecasted opening date for Phase I is December 30 , 2016 , as of January 2 , 2015 . Horodniceanu called earlier estimates lacking " the precision required " . On May 2 , 2014 , it was reported that Phase 1 of the line was 66 % complete , and six of the ten construction contracts awarded were already being worked on . The agency was still targeting December 2016 as a completion date , and the project is still within budget at a cost of $ 4 @.@ 45 billion , while serving approximately 200 @,@ 000 daily riders . As of April 2015 , the first phase is 82 % complete .

Estimated completion schedules have been widely varying . As of 2009 , the proposed construction schedule showed the Second Avenue Subway opening for passenger service in 2016 . Other publications have listed expected construction dates for Phase 1 , as well as mentioned the possible December 2016 opening . In its 2008 capital improvement budget proposal , the MTA pushed back completion of Phase 1 from 2014 to 2015 , and in 2009 , the MTA pushed it back again to 2016 . As of February 2016 , the line is still scheduled to open in December 2016 . On February 24 , 2016 , the MTA allocated $ 66 million to speed up the construction of the first phase so that it could open in December . However , in June 2016 , it was reported that contractors for the MTA were not expending extra resources to accelerate the last portion of Phase 1 construction , and that the MTA had only completed 67 % of testing , with the line requiring another 1 @,@ 100 equipment tests by October 2016 in order to be deemed operational . The contractors and the MTA blamed the delays on each other , with the MTA saying that the contractors did not show up to work on certain days ; the contractors , on the other hand , said that the MTA had asked for over 2 @,@ 500 design changes during construction , and in some cases , the contractors had to destroy and rebuild sidewalks , rooms , entrances , and other design elements that had already been built .

In a public meeting in May 2016 , the MTA unveiled the first iteration New York City Subway map that included the Second Avenue Subway and a rerouted Q service . At the meeting , the MTA also made several suggestions for service changes , including making the N train express in Manhattan and replacing the Queens section of the Q , as well as the Manhattan local section of the N , with a resurrected W train .

In July 2016 , news outlets reported that the Second Avenue Line had a " significant risk " of a delayed opening . The test train for the subway line was not set to run until October 2016 , despite the line being projected to open within two months of that date . Also , contractors had only reached 70 % of the construction milestones for June 2016 , and 80 % of the May 2016 milestones . For instance , communications systems at the stations were not finished , despite the fact that these systems should have been wired already , and the elevator at 72nd Street had not been delivered yet . As of July 25 , 2016 , construction spending was only $ 32 million for the month , even though a monthly spending goal of $ 46 million was needed to complete the project on time .

= = = = Controversies = = = =

In February 2011 , a lawsuit was filed by the Yorkshire Towers at 86th Street over the location of two proposed Second Avenue Subway entrances that were located right in front of the building but facing away from its semicircular driveway . The quality of life for building tenants was allegedly to be destroyed if the entrances were to be built in the location ; however , the lawsuit was later dismissed . In an unrelated 2012 controversy , some residents in the 72nd Street station area claimed to have come down with a " Second Avenue cough " caused by dust from construction , and local doctors saw that the air quality of the area had decreased while nasal sicknesses had increased . The MTA tried to combat this by creating new structures and using other methods to reduce dust inhalation . The MTA prepared a report that said in the 86th Street station area " all monitored concentrations were below the established benchmark levels " .

The New York Daily News alleged that the subway project was very unsafe . For example , on August 8 , 2012 , an explosion caused rocks to fly all over an intersection . Less than two weeks later , on August 21 , 2012 , an uncontrolled blast for the station was done incorrectly , causing a large explosion that sent debris into the air and broke windows of buildings in the area and damaged nearby sidewalks . In another instance , contaminated rocks were carried away from a construction

site on 63rd Street , and the incident went unnoticed . On March 19 , 2013 , in yet another allegation of wrongdoing , a construction worker got stuck in waist @-@ deep muck at the 96th Street station site , but while he was extricated after four hours of rescue efforts , he nearly died after the incident .

In a product @-@ related controversy involving the Second Avenue Subway project , American Standard Testing and Consulting Laboratories (ASTCL) , company president Alan Fortich , and five other executives admitted filing false documents on the subway tunnels and " thousands " of other New York City construction projects within 10 years . ASTCL had replaced Testwell Inc . , another firm indicted for faking concrete tests , in 2008 .

= = = Construction methods = = =

Planned construction methods varied depending on the section of the line , due to varying underground conditions . The methods planned for each section were as follows :

A number of methods will be used to tunnel for 13 @.@ 7 kilometers (8 @.@ 5 mi) underneath Manhattan , which is densely populated . About 90 % of the tunneling is to be performed by a tunnel boring machine . The rest will be done using the cut and cover method and mined drill and blast , for sections , generally the 16 stations , that average 275 meters (902 ft) in length . The stations at 86th and 72nd Streets were mined . This was challenging , given the number of expensive high rise properties in their vicinities . The 96th Street cut @-@ and @-@ cover station was about 15 meters (49 ft) deep , making it one of the shallowest stations being built on the line ; the shallowness was so that the new line could align with the preexisting piece of subway tunnel built in the 1970s between 99th and 105th Streets . Stations at the two mined stations are between 25 @.@ 9 and 27 @.@ 4 meters (85 and 90 ft) deep in rock . The construction method that was used was supposed to ease concerns for buildings above the station sites , because only two shafts were required for excavation .

In Phase 1 , there was tunneling between East 63rd and 92nd Streets and a 248 @-@ by @-@ 23 @-@ meter @-@ wide (814 by 75 ft) TBM launch box was built . That tunnel box is now part of the 96th Street station . Two access shafts were constructed for the 72nd Street station . Slurry or diaphragm walls , 1 @.@ 1 meters (3 @.@ 6 ft) wide and 6 @.@ 1 meters (20 ft) long and about 35 meters (115 ft) deep , were built alongside the sections between East 93rd and 95th Streets . Since the rock is shallower between East 91st and 93rd Streets , 1 @.@ 1 @-@ meter @-@ diameter (3 @.@ 6 ft) secant piles did the same work at shallower depths .

Earth excavation was conducted between walls once they were installed , and box structures were built using a bottom @-@ up construction method . Temporary decking constituted the top of the boxes , and the decking both braced the excavation and supported the walls and Second Avenue traffic . Of the below @-@ ground obstacles , Arup director of construction David Caiden stated : " It 's a spaghetti of tunnels , utilities , pipes and cables ? I 've never seen anything like it . " Complicating the process , the project must go over , or under , subway lines , Amtrak railway lines , and the Queens @-@ Midtown Tunnel linking Manhattan and Queens , in later phases .

There are three options for subway construction between 11th Street and Hanover Square . One option known as the Shallow Chrystie Option would mainly use cut and cover , while the Deep Chrystie Street and Forsyth Option would use a combination of the Earth Pressure Balance Machine (EPBM) and cut and cover .

There were geological anomalies along the way . Manhattan 's geology changes along the subway 's length , passing through rock and soft ground , consisting of sands , silts , and clays over Manhattan schist , and there are faults and shear zones as well as fractured rock . Hard @-@ rock Tunnel Boring Machines 6 @.@ 7 meters (22 ft) in diameter tunneled during the first phase , progressing at a rate of about 20 meters (66 ft) per day .

The stations on the line were built so that they are more wide open than most other underground subway stations in the system ; because of this , Horodniceanu likened the Second Avenue Subway stations to the stations on the Washington Metro . The tracks themselves are built atop rubber padding so as to reduce the noise from the trains .

= = Service = =

= = = Route = = =

The plans for the Second Avenue Subway involve digging 8 @.@ 5 miles (13 @.@ 7 km) of new tunnel from 125th Street in Harlem south to Hanover Square , which is located in the Financial District of Lower Manhattan . During Phase 1 , the initial phase , the line was to begin at the intersection of Second Avenue and 96th Street , running south to join the BMT Broadway Line via the existing , but rarely used , BMT 63rd Street Line . Phase I stations will be located at 96th Street , 86th Street and 72nd Street . The Q service will be routed to 96th Street . The Q service will initially have a rush @-@ hour service frequency of 7 @.@ 5 to 10 trains per hour , or one train every 8 to 6 minutes in each direction ; by contrast , the IRT Lexington Avenue Line 's express tracks (4 5 trains) have an estimated rush @-@ hour frequency of 30 trains per hour , or one train approximately every 2 minutes in each direction .

In Phase 2 , Q service would be extended to 125th Street and Lexington Avenue . After Phase 3 , a new T service will operate from 125th Street to Houston Street . After Phase 4 opens , T service will run the full length of the line , from 125th Street to Hanover Square .

The Second Avenue Subway 's infrastructure also includes a connection to the BMT Broadway Line , utilizing an existing connection via the 63rd Street Line as part of phase 1 . The Q service will operate northward from 57th Street ? Seventh Avenue , curving east under Central Park on the 63rd Street Line . The Q train would stop at Lexington Avenue ? 63rd Street with a cross @-@ platform interchange to the F train before merging with the Second Avenue Line at 64th Street . Thus , after Phase 4 is completed , the residents of Spanish Harlem and the Upper East Side will have direct mass transit service down both Second Avenue and Broadway (via transfer) to the Financial District , and across the Manhattan Bridge to Brooklyn via the Q train .

An additional two @-@ track connection is planned between the line toward Lower Manhattan (around 63rd Street) and the IND 63rd Street Line toward Queens ; current plans do not call for it to be used by regular service . Provisions are also being made for an extension north under Second Avenue past 125th Street to the Bronx , and an extension south to Brooklyn .

= = = = Other phases = = = =

The second phase , between 125th and 96th Streets , was allocated $ 525 million in the MTA 's 2015 ? 2019 Capital Plan for planning , design , environmental studies , and utility relocation . This budget originally carried $ 1 @.@ 5 billion , which would be used to start construction of the tunnels ; the MTA reduced the amount of money allocated in the budget , projecting that the agency would not be able to start construction by the end of the 5 @-@ year cycle in 2019 . Now , construction of the tunnels will likely be funded in future 5 @-@ year capital programs , and possibly not start until 2020 . Although the MTA previously expressed concerns about funding the Capital Program , spokesman Adam Lisberg stated that the reduction in funding was a result of uncertain timing and not money issues . The delay had upset politicians and residents of East Harlem , who objected to the 3 @-@ to @-@ 4 @-@ year delay . In March 2016 , the MTA began advertising Requests for Proposals (RFP) for three new contracts for the second phase , which were planned to be awarded in summer 2016 . In April 2016 , the MTA and the State of New York reached a deal to restore funding to Phase 2 .

Phase 3 , from 63rd to Houston Streets , has no funding commitments . Phase 4 , from Houston Street to Hanover Square , also has no funding commitments .

= = = Stations = = =

= = = Future full @-@ length designation = = =

The MTA had decided to designate the future , full @-@ length Second Avenue service with the letter T , in part because :

The letters O and I are too easily confused with the digits 0 and 1 , respectively .

The letter K was used until the late 1980s to denote services on the IND Eighth Avenue Line , and earlier on the BMT Jamaica Line , and thus is not preferred . H was the Rockaway Park Shuttle 's internal route designator .

The letters P , U and Y are more easily confused with common words .

The T 's route emblem was colored turquoise (hex triplet # 00ADD0 , which could also be considered robin 's egg blue or teal) because the color had also been used for the JFK Express in the past . In 2011 , turquoise was considered " the color of the year " , and at the time of the color 's selection in the 2000s , it was also considered a very upscale color .