

The Station at Broadway and 168th Street

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Introduction

Our task force studied the 168th Street and Broadway subway station which serves the neighborhood of Washington Heights and the New York Presbyterian Hospital. Based on observations and data collected, and after studying the current conditions as well as the history of the station, we determined that our recommendations for station improvements would focus on the general categories of station atmosphere and safety.

Survey Data

We performed a cluster analysis on the data to determine if groups of riders tended to be interested in the same improvements. We found that four groups emerge, one of which is concerned primarily with Atmosphere; the remaining three are concerned with different aspects of Safety, such as Personal Comfort and Safety and Personal Security. Based on these results, we determined that our plans for station improvement should focus on the general categories of Atmosphere and Safety.

Construction

The construction of the Fort George Tunnel, which runs from 157th street to Hillside Avenue in Fort George, provided some interesting engineering challenges. The geology of this area involves extremely hard rock formations that go far below the surface. As a result, it was necessary to build an incredibly deep tunnel with stations that were accessible only by elevators at 168th, 181st, and 191st streets. Using a deep-bore method, workers created long vertical shafts at 168th and 181st streets. The tunnel was then extended north and south from these two points as workers used explosives to blast through the subterranean rock.

One of the benefits of the extreme depth of the Fort George tunnel was that stations were built with the impressive arched ceilings that one can still see today. The scale of the vault at 168th street is so great that it spans fifty feet at its base.

The Columbia-Presbyterian Medical Center

About twenty years after the opening of the Fort George tunnel, the Columbia-Presbyterian Medical Center arrived on the site directly above the 168th street subway station. Interestingly, William Barclay Parsons, who was the chief engineer of the IRT, was also instrumental in the creation of the new medical center. He was, in fact, the Chairman of the Joint Board of Administrators of Columbia-Presbyterian, as well as being a Trustee at Columbia University. Thus, it becomes clear that there is not only a geographical relationship between the subway station and the medical center, but a strong historical one as well. This relationship should be more emphasized in the station design.

Conditions Above the Subway

Three major problems persist in the above ground conditions at the 168th St. subway station. First, the stop is nearly invisible to pedestrians traveling to the subway. Second, there are no adequate signs directing subway riders (or other visitors) to the Medical Center facilities. Third, the neighborhood surrounding the stop is generally unsafe at night.

Scaffolding currently covers the main station entrance at 168th Street and Broadway. In the event that this scaffolding must remain in place, signs identifying the stop must be placed in visible locations, particularly the street corner, and the standard MTA subway marker must be fixed to indicate that the station is open.

Recommendation: Visibly mark the location of the station entrance, and correct the color of the standard MTA marker from red to green.

Directional signboards placed in two conspicuous locations would simply and adequately address the problem of navigating to the Medical Center. In the station itself, there is a large blank wall that all riders must pass in order to exit. Either a neighborhood map or a list of the major buildings and landmarks with arrows would provide a quick reference

point here. Outside the station, a signboard on the 168th St. corner would be visible to exiting subway riders and pedestrians.

Directional signage is needed below ground as well as above. It is the recommendation of this task force that one large comprehensive below-ground directional poster be designed and displayed prominently throughout the station. This poster would include not only a system map and station map, but also a map of the above ground neighborhood and key buildings, and information on such transfers as the shuttle to JFK International Airport.

Recommendation: Add directional signboards near station exits, and within the station, to aid in navigating the neighborhood, the Medical Center, and the station itself.

The 168th street subway environs lack sufficient streetlights (a problem exacerbated by the scaffolding), have a moderate trash problem, and are deserted at night. Lights must be added both underneath and outside the scaffold. A security guard outside the stop would serve the area well, as the Medical Center community operates around the clock. The small park in the meridian of the two intersecting roads immediately outside the subway exit could be improved (e.g., benches, grass) to make a space for the community.

Station Safety

Due to the unusual depth of the 1 platform at 168th Street and the fact that access is limited to elevators, emergency safety is a particular concern here. There are two emergency exits, however, these exits are so poorly identified that even frequent users of the station do not know that they exist. In order to address these concerns, this task force has recommended some basic changes. First and foremost, emergency exit signs must be prominent, clearly worded, and accompanied by a simple pictorial representation of the

location of each exit. In addition, these signs must be translated into Spanish in the interest of informing as large a percentage of the station's ridership as possible.¹

Recommendation: Clearly mark emergency exits, using diagrams labeled in both English and Spanish.

A number of passageways in the 168th Street station are designed such that they contain "blind corners." This is clearly an undesirable circumstance as it prevents station users from avoiding potential danger, and creates an uncomfortable atmosphere in the station.

The passageway that connects the AC concourse to the 168th Street and Broadway entrance is long and narrow, and involves multiple turns around which one cannot see. The NYPD has identified this passageway as the most dangerous, and plans to install video cameras there so as to deter criminal behavior. Mirrors installed at each such turn would also be helpful by rendering either side of a given corner visible.

Recommendation: Remedy "blind corners" within the station through use of mirrors.

Layout

The 168th Street station's complicated layout presents a myriad of design problems and possibilities. The station is built on three different levels: the deep 1 train platform, accessible only by elevator, the AC train platform, and a concourse that connects the two platforms to each other and the surface.

Ambient and Atmospheric Improvements

Atmospheric improvements for the station include adding decorative murals at each platform level that relate both to the above ground institutional presence and the

¹ At least one other location in the station features a bilingual sign, so the precedent for this step has been set.

subway's critical transportation function, while still maintaining each platform's distinctive style. On the 1 platform, tile murals in the Beaux Arts style will depict the caduceus, ancient symbol of both the medical profession and standard of Mercury, Roman god of travel. On the AC platform, murals will reflect the modern style of the IND subway stations, utilizing a bold blue "H," modern symbol of New York City's hospital system, below an aerodynamic blue band running the length of the platform. In addition, artists from the neighborhood will be invited to execute their own murals on the long unused walls of the concourse, creating a vital connection to the community.

Recommendation: Add decorative murals on the platforms to improve station atmosphere and promote neighborhood identification.

Lighting within the station must also be addressed. The IRT platform level depends on indirect lighting to illuminate the space. Indirect lighting requires reflective surfaces for maximum effectiveness. Unfortunately, the surface of the barrel vault ceiling is not reflective. The recommended solution is to strip the surface of the barrel vault and apply a more reflective surface, such as light colored paint, plaster, or metal cladding. Once a more reflective surface is installed, current light fixtures should be replaced with more powerful models. More attention should also be directed toward aiming the light at points on the barrel vault to provide optimal luminosity and to highlight the shape of the vault.

Other areas within the station are less complicated. Simply cleaning or replacing the tiling on all surfaces provides improvement. The recommended solution also replaces the fluorescent light fixtures in the IND section of the station and in the passageways with new light fixtures that include lenses rather than exposed bulbs to improve the quality of the light.

To reduce background noise overall and to enhance the quality of public address announcements within the station, it is recommended to apply Pyrok Acoustement to the surface of the barrel vault. The easily applied, easily maintained substance absorbs

ambient noise. Acoustement has been used successfully in transportation applications, such as renovations of large train station waiting rooms and Boston area transit facilities.

Recommendation: Upgrade surfaces and update lighting fixtures to improve lighting and clarity of public address announcements.

As noted earlier, ventilation is recognized as the most significant problem at 168th Street. The solution to this problem provides three options that vary in cost and feasibility. The simplest option recommends the installation of a ventilator fan in one or more of the abandoned elevator shafts. Other options include linking the New York Presbyterian Medical Center's HVAC system to the interior of the station concourse level. This type of arrangement has been adopted in the NYCTA system when building owners and operators wish to improve a subway station adjacent to their property. A more creative although ambitious option entails the installation of a chilled water loop system. The nature of subway stations suggests that exploring the technology of chilled water loop climate control systems may provide gains in operating efficiency over traditional heat pump systems.

Recommendation: Adopt one of these three possible solutions to minimize problems with ventilation.

Congestion and Spatial Design

The root cause of the often overwhelming congestion at the 168th Street station is the reliance on elevators to move passengers between the 1 platform and the concourse. Riders exiting the elevators interfere with riders entering the elevator area from the concourse, creating congestion and occasional collisions, particularly near the turnstiles in the concourse. The situation can be ameliorated by simply adding additional turnstiles on both sides of the fare control zone, separating the flows of passengers moving from the different areas of the station.

A significant intervention is necessary to fully address crowding and safety concerns, and to increase customer comfort. The recommended solution eliminates the elevators to the IRT platform level as the primary means of access and egress between the IRT platform level and the concourse level. The recommended solution expands the elevator lobby on the IRT level to accommodate the installation of four banks of escalators at a feasible rake. Escalators also allow station users to walk to and from the IRT platform level in the event of mechanical failure. One elevator is retained for operation on the southbound platform and another elevator shaft is added on the northbound platform to accommodate persons with disabilities. The elevator on the northbound platform rises to the surface and offers a transfer to the southbound platform elevator via the concourse level. A transfer to new disabled access elevators for the IND level is also available via the concourse level.

With three of the four IRT platform level elevators eliminated, the recommended solution expands the fare control area at the western end of the station to permit 100 percent visual coverage of the concourse by the station attendants. To advance this objective, the recommended solution widens the transfer passage. This improvement eliminates many of the blind corners and increases the overall transparency of the station layout. As a result, the recommended solution improves both customer comfort and safety.

Recommendation: Add turnstiles to the concourse entrance as a short-term measure to alleviate localized congestion. To fully address the congestion inherent in the station design, replace elevators with escalators as the primary mode of reaching the 1 platform.