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New York City Transportation Mapping System

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PROJECT DATE 2011–present

URL http://www.redesigningnycsubwaymap.com

ABSTRACT Through the informal research of young adults who use New York's Metropolitan Transportation Authority's (MTA) subway system we were struck by their questioning of the relevance of the MTA's geographically-based subway map. It became evident that, as these members of society are heavily influenced by technology and technology savvy, their interest in a more rapid way to access and act upon transit information was of interest. We considered the importance of geography for communicating transit information to riders; perhaps this was not the ideal way to inform riders of train connections and context. Our hypothesis was confirmed after surveying a great deal of these people—we found that young adults connected to direct information available through technology do not rely on geography when navigating the NYC subway. Most young adults do not use the subway map to route their trips at all, instead they use an online application like Google Maps, MTA Trip Planner, or HopStop in order to enter the exact address of a departure and arrival destination. They trust the technology about which lines to take and how long it will take to get there. Once they are underground, young adults use a Smartphone app to make sure that they are on the correct lines and to check for any available transfer stops along the way. Instead of a physical map to support this rider workflow our goal was to create a schematic map that would be as easy to understand as any Smartphone app, such a schematic would allow users to focus in on their expected destinations and enable them to find available transfer stations throughout their journey. Our map was designed to be clear, simple, and easy to read; it would allow users to beneficially break away from the current NYC geographically-based subway map, a map which impacts users mindset through typical spatial notions.

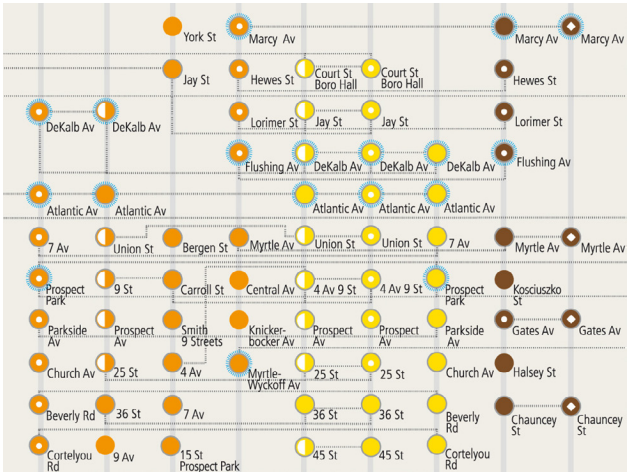

FIGURE 1: *A detail of our non-geobased transit "map."*

INTRODUCTION

In the Spring of 2011 "Redesigning the New York City Subway Map" was a course offering at Parsons the New School for Design. This course required a collaborative, exploratory approach with a goal toward the redesign of the subway map in a completely unrestricted manner. The class was co-taught by an information designer, Julia Wargaski, and by a type designer, Paul Shaw. Students were encouraged to create their own map regardless of past or current aesthetics and design logic respecting the NYC subway map design. This new map could be utilized in a paper format as well as in a digital environment. As the course was held in New York, the instructors were also able to provide students with the valuable resource of meeting with (and receiving critiques from) esteemed designers of past subway maps. Throughout the semester students planned and designed their maps in teams, or on their own, each week presenting their ideas to the class (as well as faculty and guest faculty) for critique. The final class was a symposium of maps in which a new group of guest critics came into the class to interact with the final products.

THE GENERAL PROCESS

The class was centered on creating a final product with the early weeks of the course fully directed toward research. Students were encouraged to immerse themselves in the history of the NYC subway map, as well as investigating the design of other maps from different transit systems around the world. Students were required to take several "field

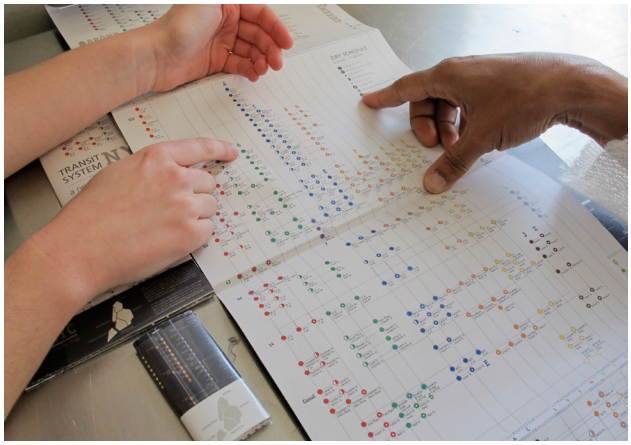

FIGURE 2 *and* FIGURE 3: *During the course of designing the informative visualization there were considerable levels of analysis and feedback, this ranged from formal critiques of outside guests to multiple presentations on the wall for faculty and student observations.*

research" trips throughout the city, using only the current subway map as a guide.

After this initial stage, students began planning the redesign of the current subway transit system for their own, unique map. Several weeks of sketching and planning were integrated with presentations by experienced and renowned designers such as Massimo Vignelli and Michael Hertz—these designers were the creators of transit maps that were actually produced, currently, and in the past. Students had the opportunity to directly ask these designers questions about their implemented designs, the designers also addressed questions about the maps the students themselves were creating. There was a midterm critique of the students' maps by some of these guest speakers as well as a final critique held on the day of the course. For the final presentation some of the guest speakers returned for this critique and were joined by other Parsons staff and outside critics (FIGURE 2 and FIGURE 3).

Most students presented maps that were logical and aesthetically pleasing updates of the current geographic map. Some students designed their maps to highlight specific elements of the city—neighborhoods, landmarks, and other modes of transportation. One student served as the class researcher, using other students' maps in a focus group in which the maps were tested by outside users as they were being created.

Our map was the most radical design of the class in that it was not actually in a typical map format. We were the only team to reconsider the map logic altogether—creating a map entirely void of geography.

HISTORY

In 1904 the New York City Subway System opened to the public for the first time.[1] It was a ground-breaking moment in NYC history, and although the transit system would change drastically over the next 100 years (and beyond), great opportunities immediately opened to New Yorkers in terms of accessibility and transport.

Many maps have been designed for the New York City subway system, arguably the most complex city transit system in the world. As technologies have advanced from that time, new opportunities also arose for developing the transportation system mapping. There are now scores of NYC transit Smart Phone applications and web sites to map and track subway routes and trains. We are all familiar with the success of Google Maps[2] and HopStop[3] and their impressive ability to immediately map routes for transit systems.

Our map was influenced by the designs of Massimo Vignelli,[4] Eddie Jabbour (KickMap),[5] and an iPhone application called "CityTransit."[6] Each of these maps plays with geography in different ways. Vignelli's map was the first to test the idea of straying away from geography and incorporating a schematic "dot per stop" system. Eddie Jabbour's map may be considered a more contemporary version of Vignelli's map. Magnetism Studio's CityTransit, along with a geographic view, has a "lines" view—a separate diagram of each subway line, listing only the stops and transfers available at each stop.

TARGET AUDIENCE AND UNIQUE APPROACH

It is difficult to redesign something that possesses so much aesthetic familiarity; after an initial inclination towards a "geographic update" approach, we decided to drop all hesitations and take a chance on a map entirely void of geography (FIGURE 4). We focused on stops and transfers, not spacial areas. Therefore, our emphasis was

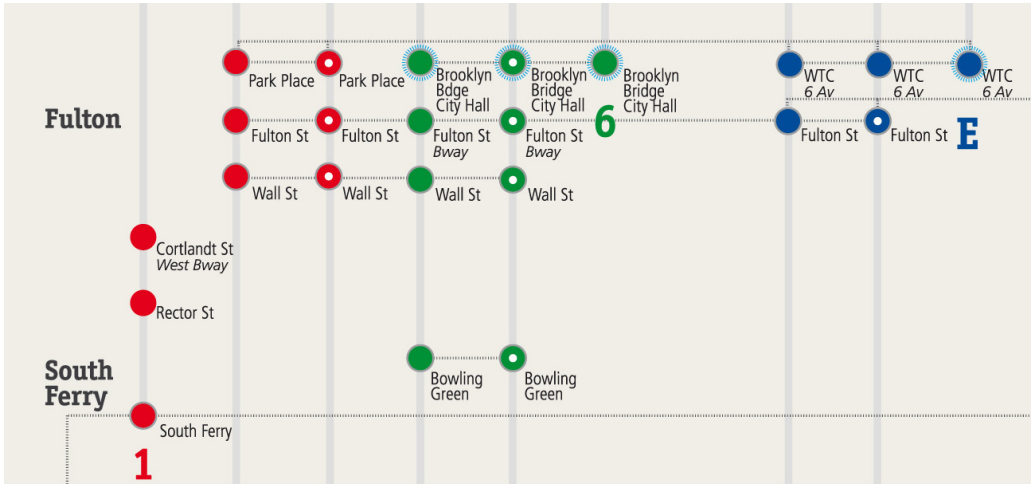

FIGURE 4:
Another detail, showing that the approach did not rely on any formal geography though it did consider critical aspects of location.

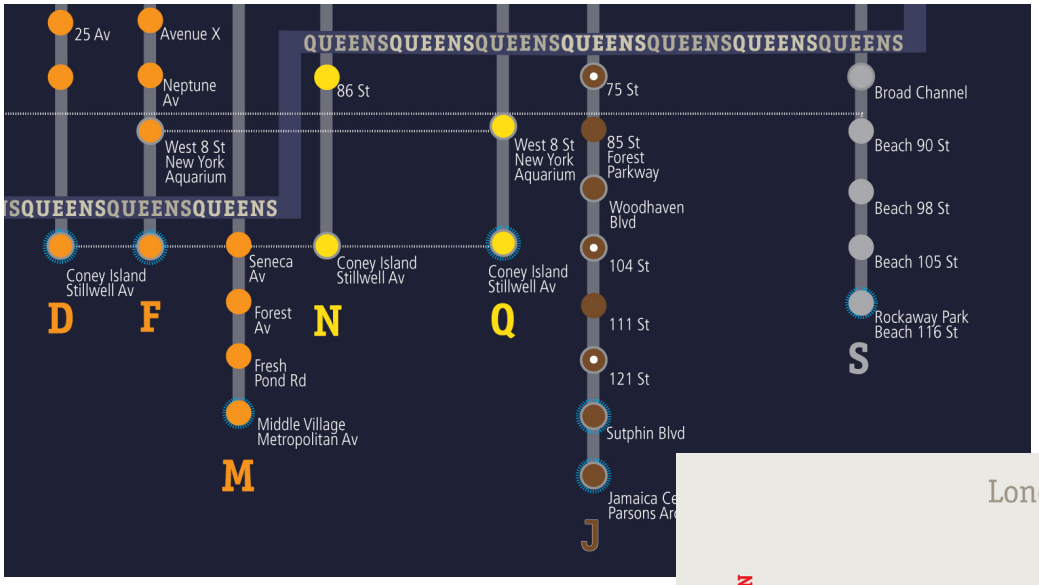

FIGURE 5:
An important innovation was a readily discernible variation for night usage; one side of the map presented daytime routing, the other, with a black ground, revealed nighttime usage—this was a user friendly method to de-clutter the text.

not on Manhattan's size in relation to Brooklyn, or what color Central Park would be.

A subway map has a very broad target audience. Unlike a lipstick ad for a targeted consumer, or an information graphic about high-school dropout rates for statisticians, educators, or parents, our information had to appeal to everyone who rides the subway system. We decided, however, to narrow that audience to young adults—those individuals who are most heavily influenced by technology. It is unusual for a young adult to be without at least one form of technology at all times. Technology is their communication lifeline, their connec-

FIGURE 6: *The logic of the non-geographic schematic was easily applied to other transit applications such as in this example for the Long Island Rail Road.*

tion to friends and family and to the world around them.

Following the design logic of Vignelli and Jabbour, we decided to give each subway line equal prominence. This made the process of differentiating local and express trains much simpler. For example, there is no need to determine if the Q is a local or express train. All a user of our map has to do is notice where there are dots on the map. If there is a dot on 28th St. on the Q line, the Q stops on 28th St. If there is no dot, there is no stop.

Another innovation we've added to our map is a night map (FIGURE 5). On the alternate side of the map we offer a map with a dark background that includes the stops only available during what the MTA defines as night hours (11 p.m.–6 a.m.). This makes our map more usable 24 hours a day (and particularly useful for any late-night, city-going, young adult).

Due to the accessibility of our design, and the ability to transfer the logic to other systems, we decided to create an accompanying set of maps—including the Long Island Rail Road, the New Jersey Transit, The PATH, and the Metro-North Railroad (FIGURE 6). These systems are much less complicated than the New York City subway system and easily lent themselves to our linear design.

THE SPECIFIC PROCESS

After we had familiarized ourselves with the general route structure of the New York city transit system, something we continued to learn more thoroughly as we progressed through the project, we decided to reach out to our target audience, young adults, in order to understand how they used and understood the subway. We primarily reached out to friends and peers. Via email, we sent them a questionnaire to fill out and send back to us. We asked questions about how often they traveled on the subway, we asked what was, to them, the most confusing part of the NYC subway system. We also enquired as to whether they used any technological devices or applications to map their route on the subway: most replied that they did use applications and technology supporting technology. We knew that we were on the right track.

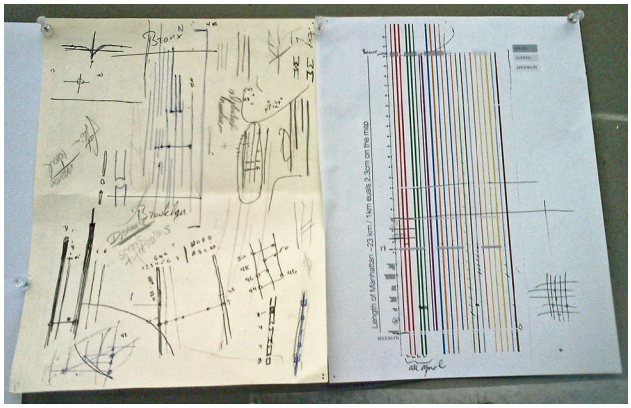

FIGURE 7: *Hand drawing allowed rapid development for some aspects of the map, additionally it permitted us to denote discrepancies from our varied sources.*

The process continued as we went from computer to map and back again, plotting points and checking sources (FIGURE 7). One of the most difficult parts of this project was ensuring that we had accurate information. There were a few discrepancies between the current map, the subway map iPhone app we were using, and other online sources. It was difficult to know which was accurate without riding the entire system, which was obviously an impossible feat within the ten week period we had left to complete the project.

We decided to keep the train line colors the same as the current ones, to avoid confusion for users who might already be jarred by our radical design. We split up each set of trains into individual lines, and plotted points on lines in Manhattan. Each line with a stop in that location got a point. Obviously, the endeavor became more difficult as we continued our mapping venture into the other boroughs. Unfortunately for the map-making community, not *all* of New York City is a grid. After several weeks of deliberation, we decided to line up the stops that were not in the grid in the closest proximity to other stops that they transferred with, *regardless of geography.* The map did end up being much more geographically-inclined than we had planned, because stops that transfer to each other tend to be at a similar place on their individual lines, so many areas ultimately lined up.

The element that we struggled most with was figuring out a way to display transfers from one line to another. In a geographic map this is much easier because the lines aren't so spread apart, but it is also arguably much more difficult to read. We used a fine, dotted line to show transfer stops and simply connected dots with this line.

Due to time constraints we had to simultaneously plan and design the map. It was necessary to generate some outcomes prior to fully determining the global logic. As we were making lines and plotting points, we were also choosing background colors and typefaces. We went through many changes of typography, color, and style. Finally we pared down to a simple, non-invasive design that was appealing without distracting the user from ascertaining the core information on the map.

FIGURE 8: *In order to test the practicality of the design a complete set of comprehensives were printed and folded to the correct size. These prototype comprehensives permitted final analysis and critique of program detail, such as aspects of editorial clarity and readability.*

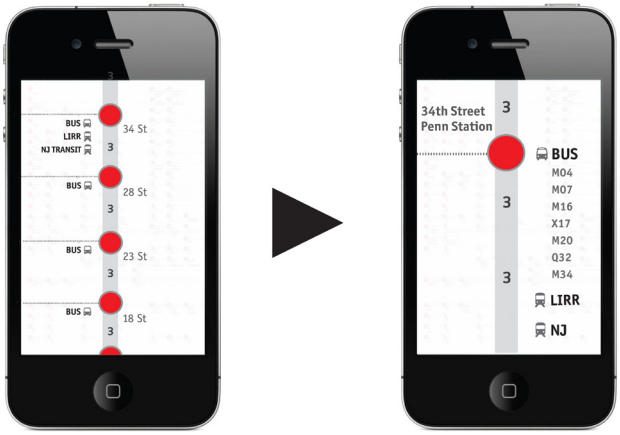

FIGURE 9: *Future plans include the translation of the design scheme and content into an applet for smartphone usage, by generating transit locations outside the restrictions of geography, users can quickly ascertain stop numbers and alternate transportation options.*

CONCLUSION

One of the most important things we learned through this process was about integrity, integrity of mission, of purpose, of design. Sticking with a non-typical design trajectory was indeed difficult, but ended up being worth it. We took on a project that was not as conventional as the rest of our class members' geospatial approaches. Therefore, we had less primary sources to consider. In addition, we spent many weeks planning and organizing information about our target audience: young technology adopters. We wanted to create a map that would be useful and practical for them, which for us meant creating a non-geographic, stop-centric map. In time, though we were able to create a successful and readable map, we just had to stay strong to our mission and have a strong sense of our design throughout the process.

In the end we were able to create a fully functioning, foldable subway map (in two sizes—large and pocket-sized) that users can take with them anywhere while navigating the subway (FIGURE 8).

The future for our mapping logic is promising; a digital iPhone app prototype is in the works (FIGURE 9), and we hope to create a website for our map that has a similar style and functionality, but even greater web capabilities. This application would be similar to Google Map or Hop-Stop mapping functionalities and illustrated by our map in digital form. We hope that this app will mirror our map design, but incorporate greater levels of detailed mapping, including GPS and a street-view option. We believe that these expansions are only natural for such a digitally inspired map. We feel that the target audience will get even more out of these digital versions, due to our survey evidence young adults utilize technology an incalculable amount of their everyday lives.

ACKNOWLEDGEMENTS

We would like to thank our professors, Julia Wargaski and Paul Shaw for all of their wisdom, feedback, and support throughout this entire process, and beyond. We would also like to thank everyone who contributed to our survey process, revealing important information about our target audience and design. We would like to thank our peers in the *Redesigning the NYC Subway Map Class* for all of the critique and feedback, and we would like to thank *Parsons the New School for Design* for providing us with this opportunity.

BIOGRAPHIES

Hannah Lea Dykast is a designer primarily working in the field of graphic design, ranging from: information design, branding, print, editorial and packaging, to motion, sound, and web. Born and raised in South Germany, Hannah received her Abitur/International Baccalaureate Degree in Germany before she came to New York where she is currently a senior in the BFA Communication Design program at Parsons The New School For Design.

Sarah Piper-Goldberg is a senior at Parsons the New School for Design, where she majors in Communication Design. Sarah hopes to create a visual language that benefits the world around her. She is interested in information design because it brings clarity to many complex issues and ideas through a plethora of interpretations.

NOTES

1 Metropolitan Transportation Authority, "New York City Transit, History and Chronology," http://www.mta.info/nyct/facts/ffhist.htm (accessed September 10, 2011).

2 Google Maps, http://maps.google.com (accessed September 10, 2011).

3 HopStop, http://www.hopstop.com (accessed September 10, 2011).

4 Vignelli Associates, "New York City Subway Diagram 2008," http://www.vignelli.com/home/transportation/nysub7.html (accessed September 10, 2011).

5 KickMap, http://www.kickmap.com (accessed September 10, 2011).

6 CityTransit, http://magnetismstudios.com/CityTransit (accessed September 10, 2011).

NYC SUBWAY MAP

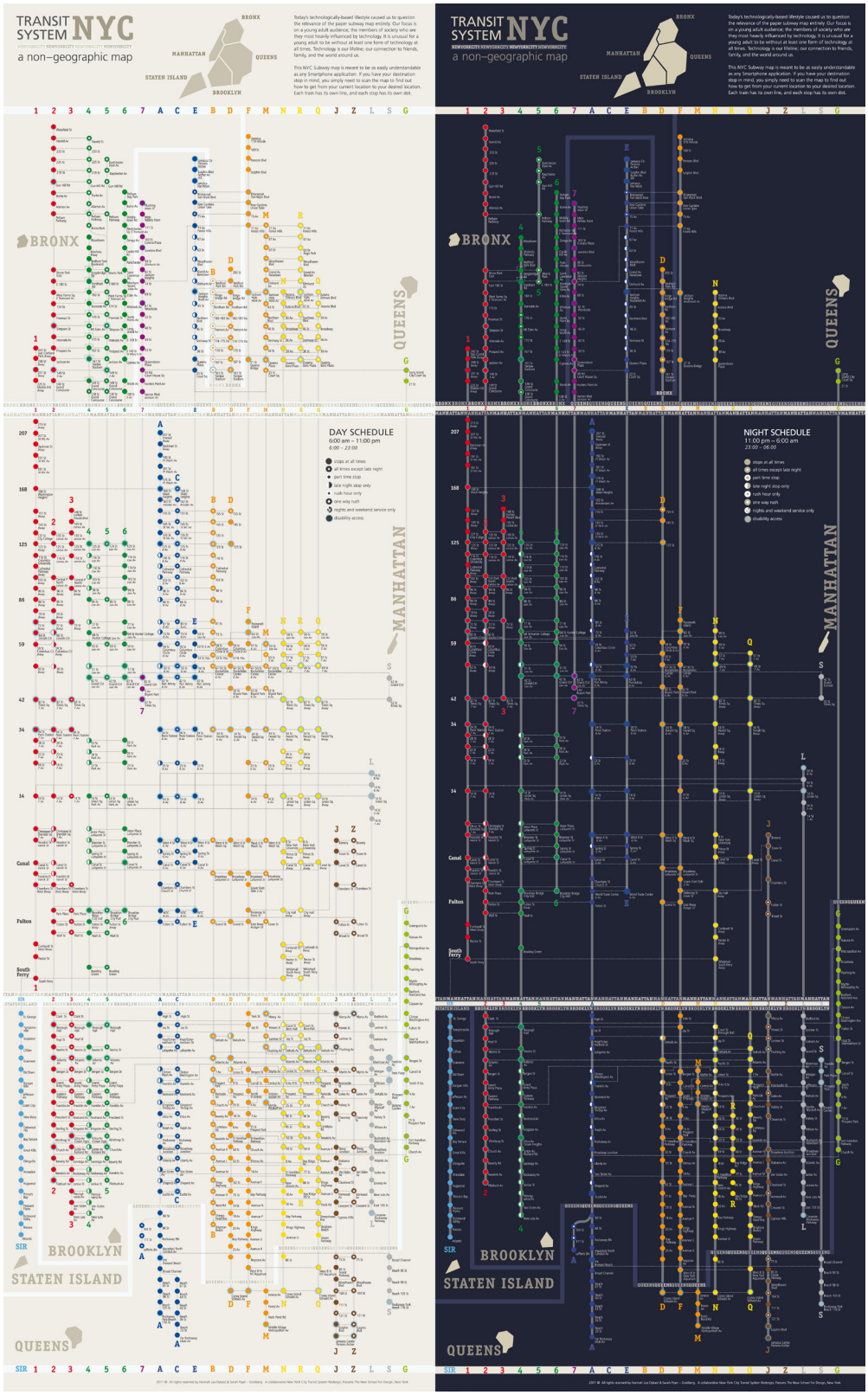

FIGURE 10:
The complete map is shown here in reduction; the MTA system is portrayed as a compact, relational diagram—all the connections are readily apparent; in this manner the essential nature of interconnectivity is portrayed.