



L Train Closure and Mitigation

Mitchell L. Moss, Sarah M. Kaufman, Jorge Hernandez, Sam Levy

NYU Rudin Center for Transportation

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Executive Summary

The L train tunnel between Manhattan and Brooklyn will close fully to trains for 18 months in 2019 to repair extensive damage from Superstorm Sandy. The construction will require a shutdown of service in all of Manhattan and continuing regular service between Bedford Avenue and Canarsie, with no connection on that line between Brooklyn and Manhattan.

The L has become synonymous with the Brooklyn brand; ridership at Brooklyn's Bedford Avenue station has increased more than thirty percent since 2010. The L train's surrounding Brooklyn communities will absorb the economic impact of this tunnel closure: jobs, commutes dining and nightlife will be affected.

- Of the 225,000 daily residents that commute via the Canarsie Tube, more than 65,000 of them are travelling to their primary place of employment.
- Residents of Williamsburg and Bushwick, who typically rely on the L train, currently enjoy average commute times of less than 35 minutes.
- More than 1,000 restaurants surround L train stations in Brooklyn (855) and Queens (145), including five Michelin star-rated restaurants.
- Williamsburg and Bushwick have more liquor licenses per square mile than any other neighborhood in the outer boroughs. The L has allowed nightlife in Williamsburg to flourish.

To mitigate the economic impacts of the L train shutdown on these neighborhoods, the NYU Rudin Center recommends that policymakers act now to institute alternative service options:

1. Increase subway service by bolstering connecting lines, including the G, E, R, M, 3, A, C, J and Z to substitute for L train service.
2. Institute high-speed bus service, including a peak-hour bus-only lane on the Williamsburg Bridge.
3. Develop public-private partnerships with ridesharing companies, including Uber, Lyft, Via and Bridj, to help shuttle Brooklynites to various points in Manhattan.
4. Increase East River Ferry service during rush hour, with transfers to subways and buses.
5. Offer incentives to bike and car shares, including Citi Bike, ZipCar and Car2Go, to increase offerings near the bases of the Williamsburg Bridge.
6. Explore entirely new modes of transportation, including a gondola and scooter share.
7. Involve local chambers of commerce and business improvement districts in coordinating evening and weekend service to and from Williamsburg to mitigate impacts.

This long-term closure will give the MTA and city agencies an opportunity to work together and increase city's transportation options in the long run.

Introduction

The Metropolitan Transportation Authority (MTA) has announced a timeline to repair the Canarsie Tube, the tunnel connecting the L Train between Brooklyn and Manhattan. The Canarsie Tube must be repaired following the damage incurred from Superstorm Sandy; it was flooded by 7 million gallons of saltwater and closed for 11 days in 2012, reopening after short-term repairs were put in place.

The L train tunnel between Manhattan and Brooklyn will close fully to trains for 18 months, beginning “no sooner than 2019.”¹ This plan, which will expedite repairs while shutting down service in all of Manhattan and continuing regular service between Bedford Avenue and Canarsie, is an intelligent decision. The alternative option, which would close one track at a time and reduce service across the tunnel to 20% its current capacity, would require 36 months and complicate both construction and commutes.² The MTA’s decision to expedite the work will allow for focused construction with limited interruptions.

This debate has triggered public interest in one of the city’s most distinctive and culturally-identifiable subway lines. Since declining to historical lows in the 1980s, annual ridership on the L has recently surpassed historical peaks set in 1947, reaching 133 million annual riders in 2014 (Figure 1). Stations along the L in Brooklyn have experienced far greater growth in usage than those in Manhattan, growing nearly 20 percent in the last five years (Figure 2).

The L has become synonymous with the Brooklyn brand; its surrounding communities will absorb the impact of this tunnel closure. This analysis investigates the importance of the L train by looking at the people and activities that it serves. It concludes with recommendations to mitigate the effects.

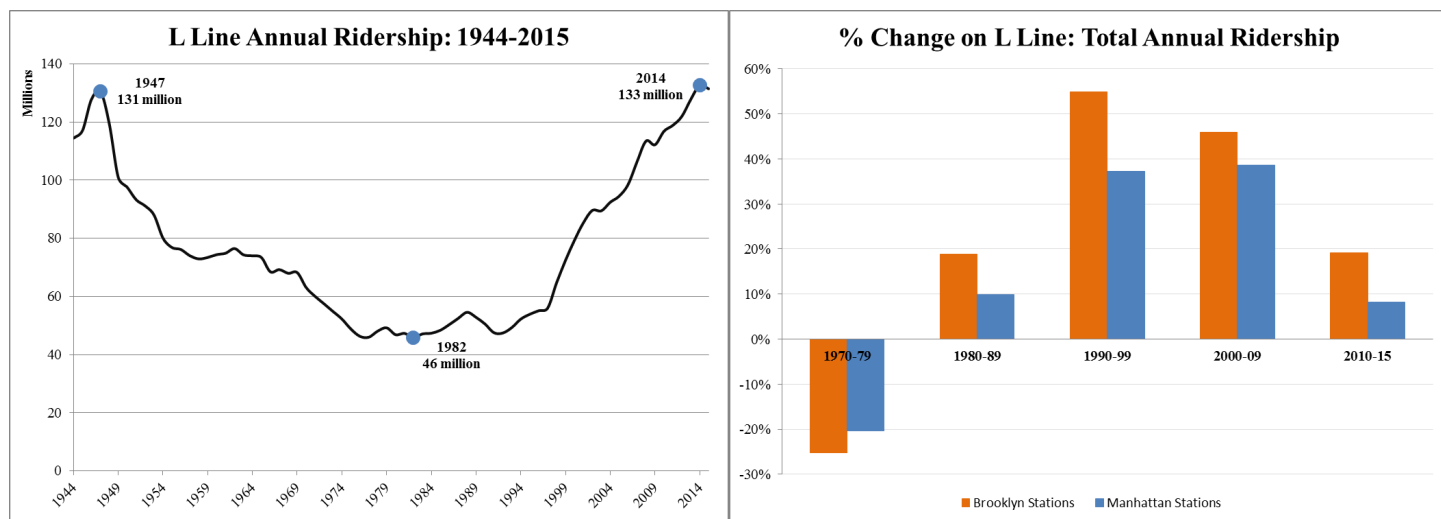


Figure 1

Figure 2

¹ “Decision to Completely Close the Tunnel Follows Months of Community Meetings, Stakeholder and Public Input on Reconstruction Options; MTA Will Develop and Announce Service Plans as 2019 Project Approaches,” MTA.info, July 25, 2016.

² Gothamist.com, Jan 13, 2016.

L Line Facts

The L line runs for 10 revenue track miles from the west side of Manhattan east to Canarsie, Brooklyn. The L was historically part of the Brooklyn Rapid Transit Company (BRT) when it began service in 1915. Years later it became part of the Brooklyn-Manhattan Transit Company Corporation (BMT) as it took over the BRT. The line includes 24 stations in 13 neighborhoods: Chelsea, Greenwich Village, Union Square, Gramercy Park, East Village, Stuyvesant Town, Williamsburg, Bushwick, Ridgewood, Brownsville, East New York, Cypress Hills, and Canarsie.

The L is the primary subway line servicing north Brooklyn. Only one other subway line (the G) intersects with the L in western Brooklyn; farther east, the L intersects with the M at Myrtle-Wyckoff; the J/Z and A/C lines at Broadway Junction, and finally with the 3 at Junius St without an out-of-station transfer in Brownsville/East New York.

The L became the first line to implement the R143 subway cars, which in 2001 were considered the most advanced subway cars in public transit. These cars feature Communication-Based Train Control (CBTC), which allows them to function by computer algorithms; they can travel more closely together, allowing for more trains per route. In 2012, CBTC was fully integrated into the L line and NYCT added 98 weekly round trips to the L train schedule.³ This technological advance is largely responsible for absorbing the surge in ridership along the L and avoiding the infrastructure obsolescence plaguing the other subway lines. If damages are not addressed, the MTA believes that the efficiencies gained by the advanced technology will continue to diminish, and service will further deteriorate as does the tunnel.



Demographics

The rapid rise of neighborhoods along the L, especially Williamsburg, has led to constant construction of apartments, hotels and a proliferation of small businesses concentrated around the first few L train stops in Brooklyn.⁴ During the winter of 2015-16, median rent for a 1-bedroom apartment in Williamsburg was \$3,300, surpassed only by two other neighborhoods in Brooklyn – Vinegar Hill (\$3,899) and DUMBO (\$3,880).⁵ A major

³ MTA – NYCT

⁴ Williams, Alex, *The Williamsburg Divide*. New York Times. Sep 25, 2013. Web. Accessed 2/10/2016

⁵ Chen, Crystal. *The Cheapest and Most Expensive NYC Neighborhoods for Renters This Fall*. Zumper. Feb 29, 2016. Web. Accessed 3/14/2016

driver for this buildup is the convenient train service, which has attracted artists, students and young professionals into the many neighborhoods along the L. From 2000 to 2010 the population of Brooklyn Community District 1 and 4 increased by 8%.⁶ Both CD's have a total population of over 285,000. The chart below shows the increases in subway ridership, demonstrating the relationship with population growth.

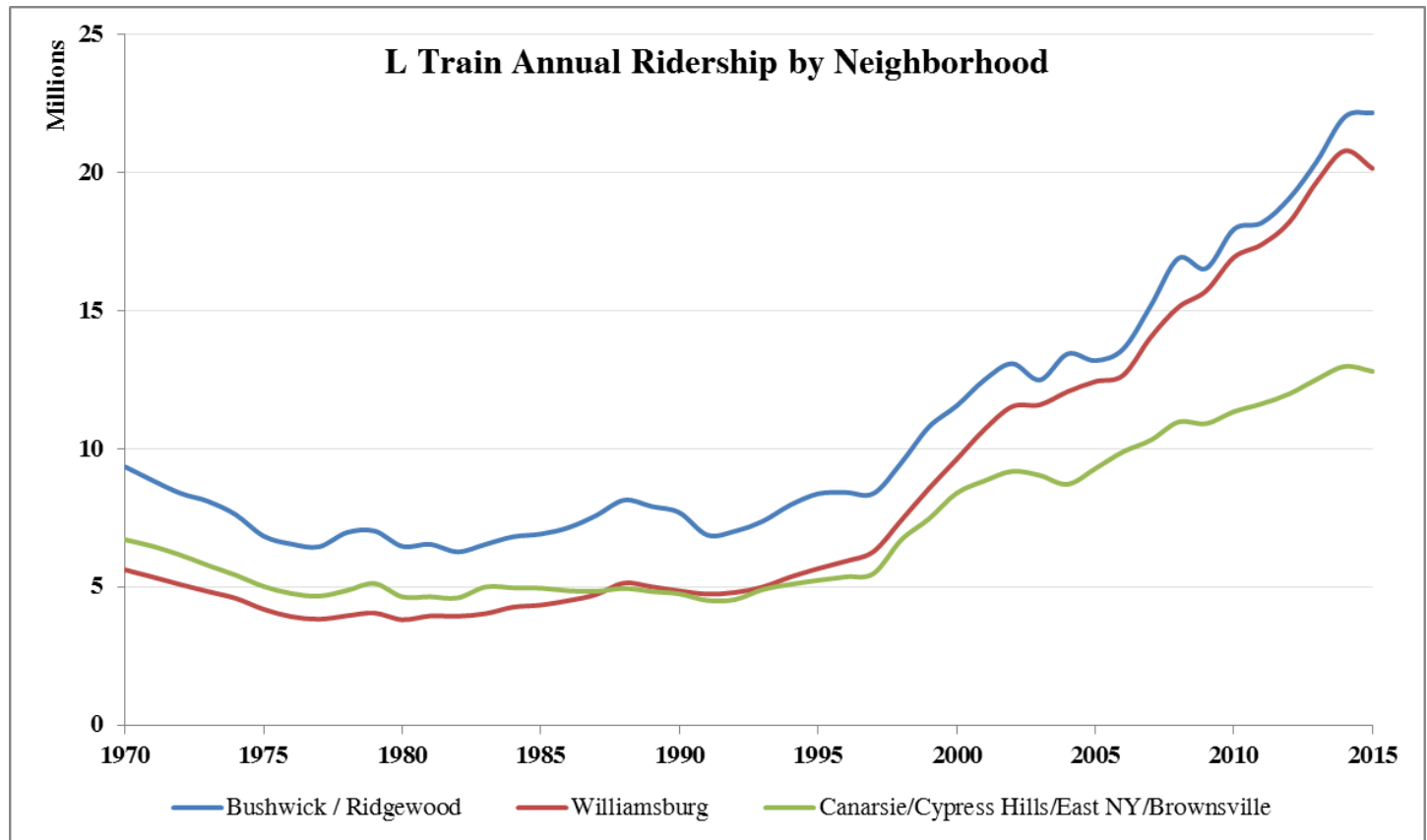


Figure 3

⁶ NYC Department of City Planning – Community Portal. Web. Accessed 5/10/2016

Annual Subway Ridership Change 2010 - 2014

— L Line

■ Catchment Area

Annual Subway Ridership

Change, 2010-14

- > +30%
- +21% - +30%
- +16% - +20%
- +11% - +15%
- 0% - +10%



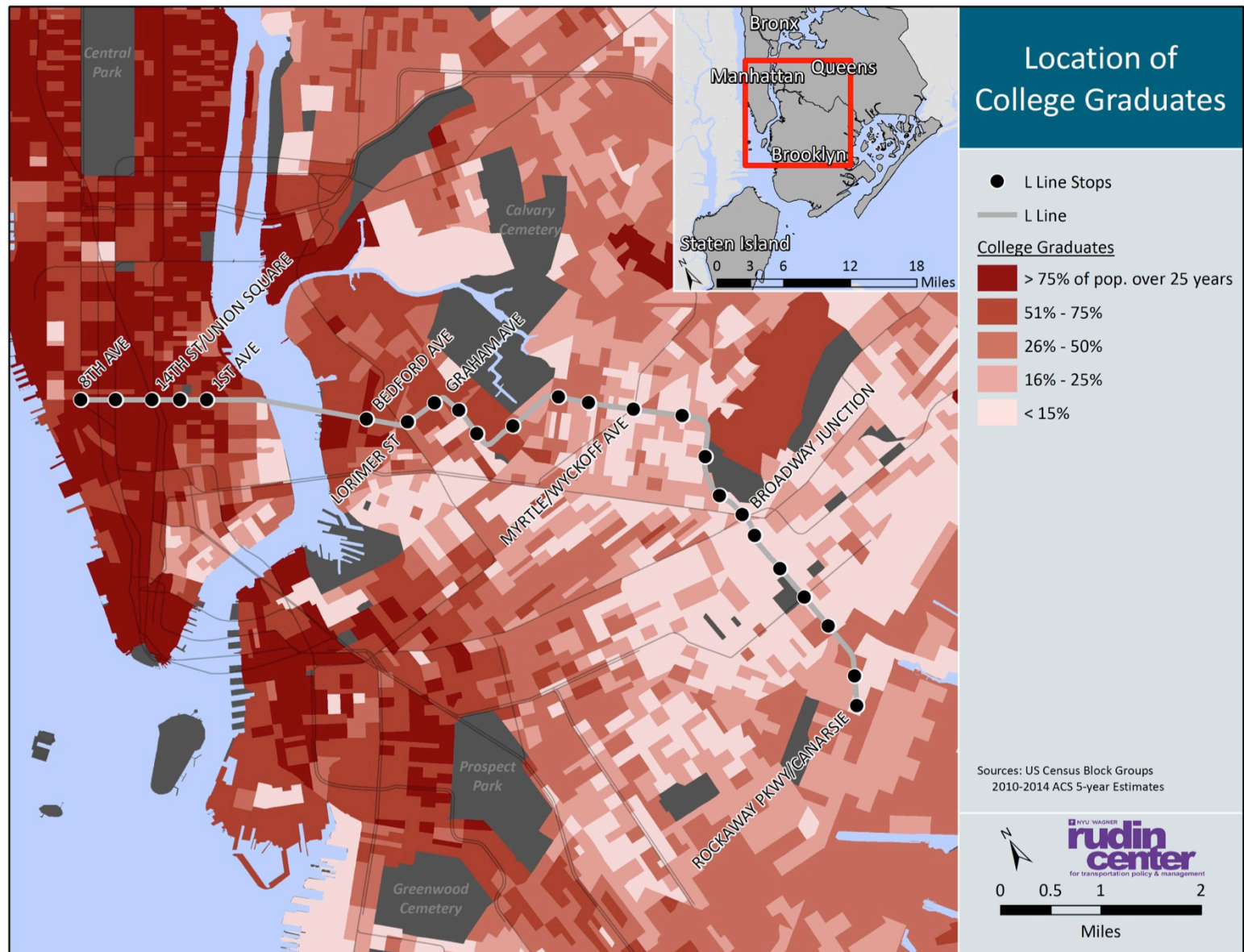
Sources: MTA NYCT

Education

As shown in the map at right, the first six stops in Brooklyn are surrounded by areas with high concentrations of college graduates. In North Williamsburg and Greenpoint, more than half of the populations hold college degrees. In South Williamsburg and further east along the L, however, there are concentrations of census tracts where fewer than 15% of residents are college graduates. In South Williamsburg there is a large Hasidic population influencing the distribution of college graduates.

The concentration of higher-level formal education degrees affects a potentially disproportionate

influence of these neighborhoods on the political process. The initial news that the MTA was planning to shut down the Canarsie Tube led to an uproar by residents and business owners in Williamsburg. While service disruptions will affect the L's various users differently, the concerns of residents in less influential neighborhoods, such as Brownsville and East New York, should be considered equally.

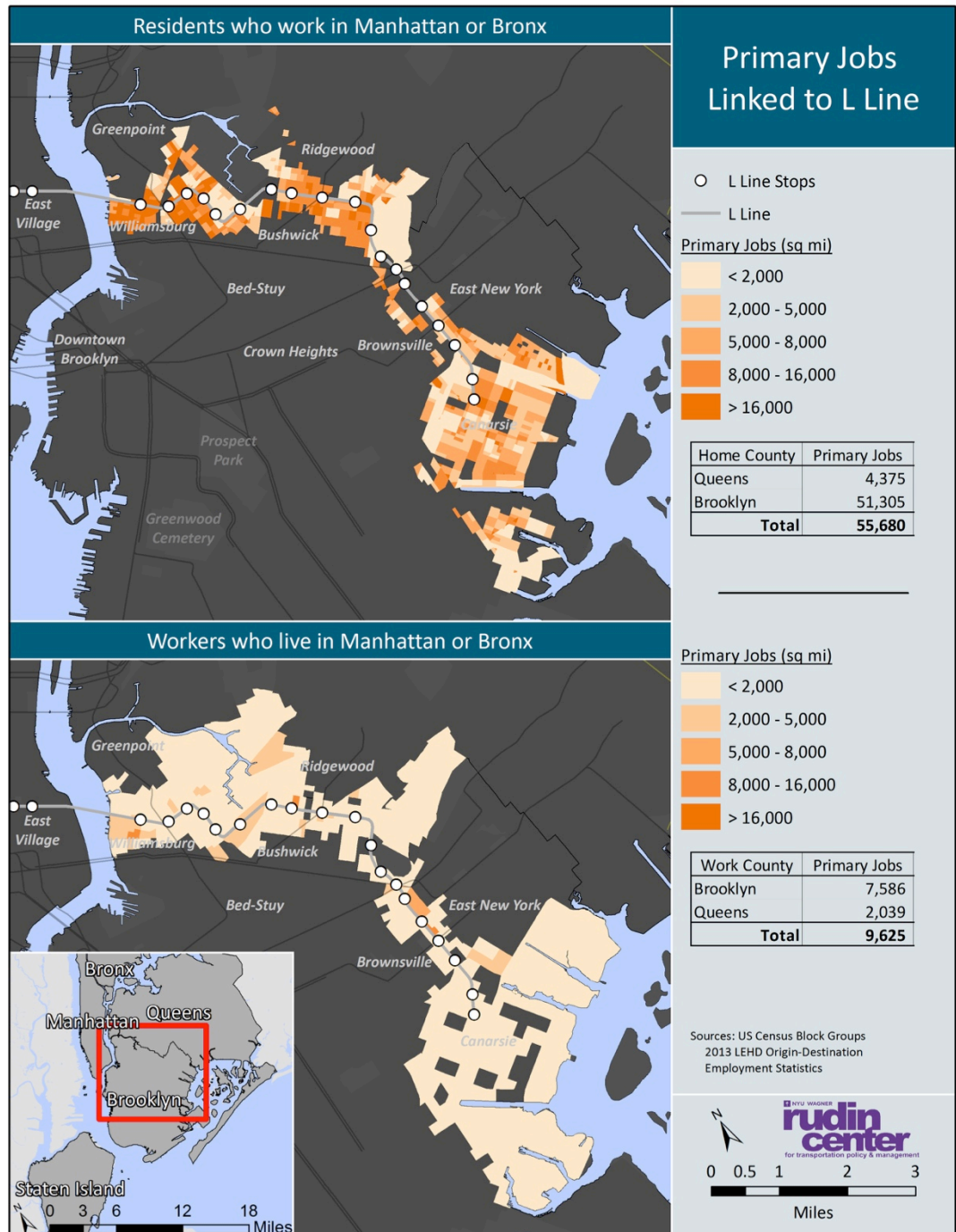


Employment

The L Line serves 55,680 residents living along its route with primary jobs in Manhattan or the Bronx, and 9,625 workers from Manhattan or the Bronx traveling to places of work along the L route. In aggregate, out of the 225,000 daily residents that cross using the Canarsie Tube, more than 65,000 of them are travelling to their primary place of employment. These numbers were estimated using the U.S. Census, 2013 LEHD Origin-Destination Employment Statistics for census block groups along the L's catchment area.⁷

Our catchment area does not include Greenpoint due to the two stops off the G line. However, it may safely be assumed that of the 9,000 residents traveling to or from Greenpoint for their

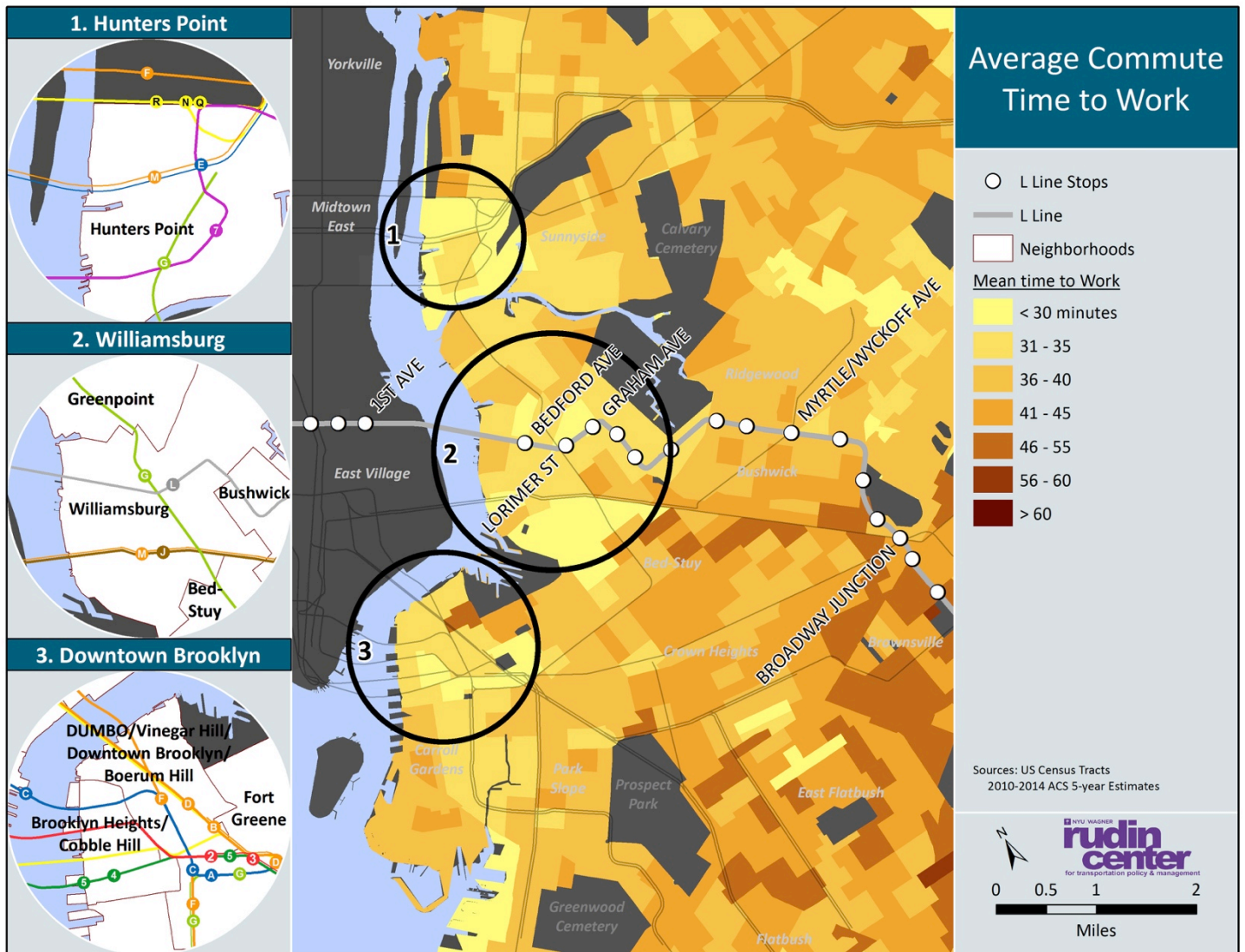
primary job, a percentage of them are also riding the L. Thus, those who use the L for their primary job commute may well be over 70,000 New Yorkers. In addition, the LEHD data does not include residents with secondary or informal jobs; the number using the L for work-related purposes is in fact much higher than our estimates.



⁷ A primary job is defined by the LEHD dataset as a worker's highest paying job. This LEHD dataset allows us to estimate with far greater certainty the relationship between workers and the L. We also assume that those within our catchment area only use the subway for their work commute.

Commutes

Residents in Brooklyn and Queens along the East River have, on average, shorter commute times than much of New York City. When analyzing the general areas of Hunters Point, Williamsburg, and Downtown Brooklyn a key distinction arises in subway redundancies. As may be seen in the maps on the following pages, the Hunters Point area has four different subway lines crossing into Manhattan, while the general area of Downtown Brooklyn has seven. Those affected most by a closure of the Canarsie Tube in north Williamsburg are serviced by one subway line (the L), while south Williamsburg has access to three subway lines (J/Z and M lines) for direct access to Manhattan.

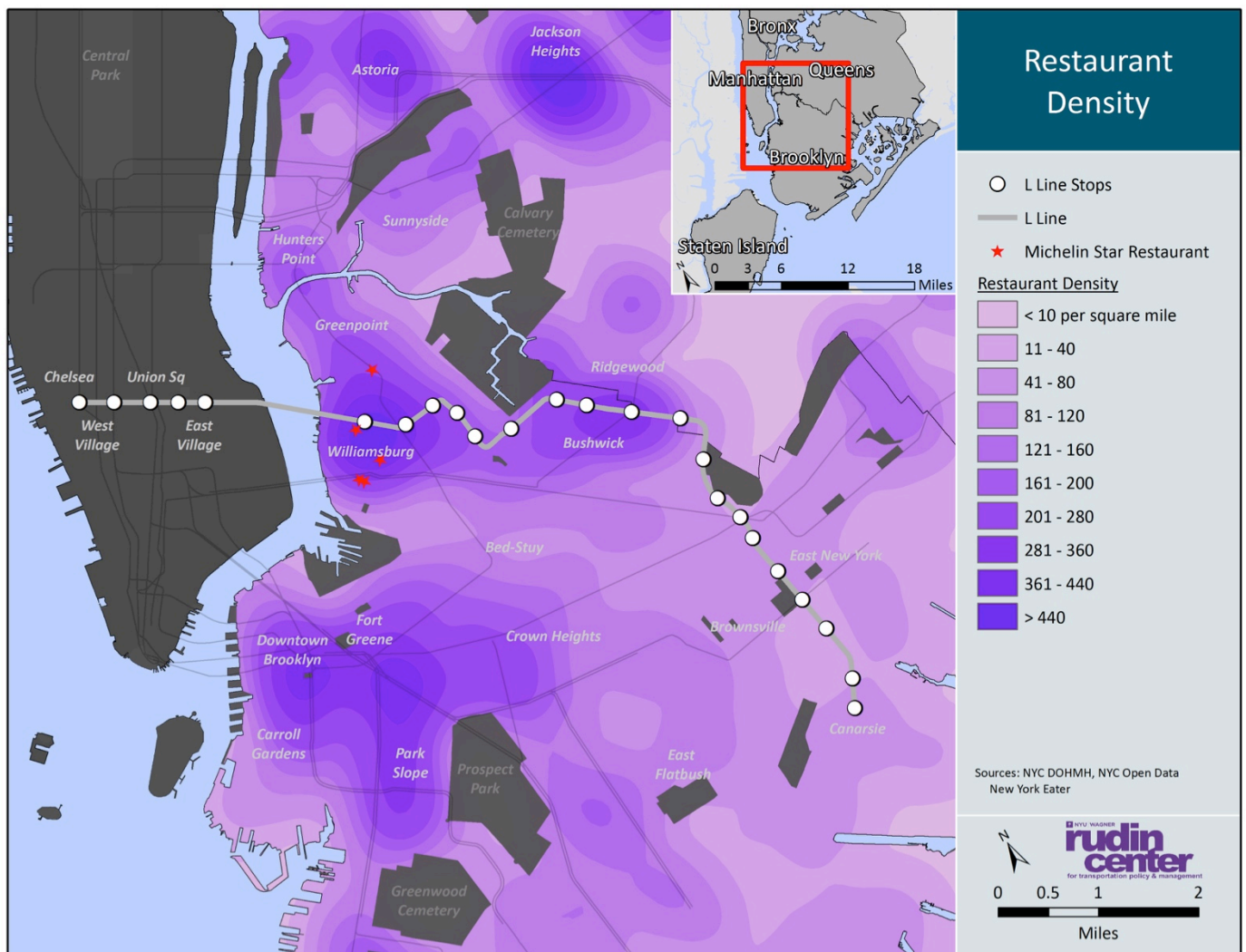


Dining

While rush-hour replacement services will be vital during the tunnel's repair, the diverse use of the L for recreational purposes must also be considered. More than 1,000 restaurants are located off the L outside of Manhattan, with 855 in Brooklyn and the remainder in Queens. Fourteen percent of all restaurants in Brooklyn are located within our catchment area. Of the 76 Michelin Star-rated restaurants in New York City, five are located in close proximity to the L, with four in Williamsburg and one in Greenpoint.

The highest concentration of restaurants per square-mile in Brooklyn is in the immediate vicinity of the Bedford Avenue stop; disrupting service along the L will profoundly affect restaurant owners, their employees, and the city's food services industry as a whole.⁸ Bedford Avenue is the busiest station along the L, with more than 27,000 average daily weekday riders and 45,000 riders on weekends.⁹

New Yorkers from all boroughs visit North Brooklyn restaurants. Ensuring the long-term operability of the L is crucial to Brooklyn and entire City's culinary offerings.



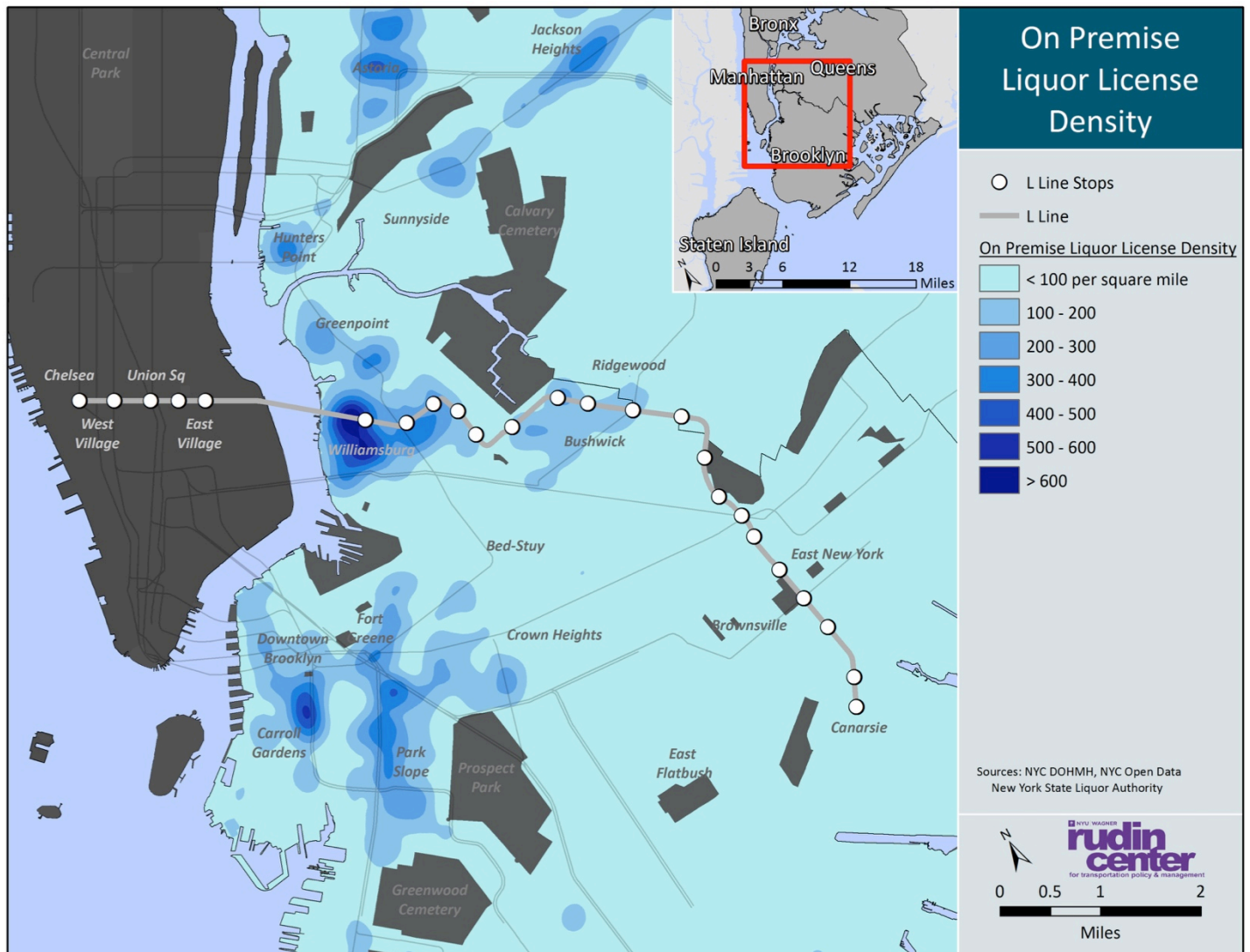
⁸ In NYC the *food services and drinking places industry* added the greatest number of jobs in 2014 and is expected to grow more than twice as fast as the overall city economy (New York State – Bureau of Labor Market Information)

⁹ MTA, Average Weekday/Weekend Subway Ridership, figures as of 2015. Weekend ridership combines Saturday and Sunday.

Nightlife

Williamsburg is a weekend destination, rivaling the hotspots of Manhattan. On weekends, the Bedford Avenue stop is the twenty-first most utilized in all of NYC. During an average weekday it is ranked 44th in ridership.

Outside of Manhattan, few neighborhoods have high concentration of bars and nightclubs. As shown in the map below, neighborhoods along the L – specifically, Williamsburg and Bushwick – have more liquor licenses per square mile than other areas of Brooklyn. No other neighborhood in the outer boroughs compares. The L has allowed nightlife in Williamsburg to flourish, as much as other neighborhoods in Manhattan that have far greater connectivity.



While many people will still be willing to make the trip across the river for special events or exclusive performances, such as Smorgasburg and Brooklyn Bowl, small businesses may not be so fortunate. The local economy has been as dependent on visitors as residents. Every weekend, tourists, college students, working professionals and foodies venture across the East River to Williamsburg on dates, to buy artisanal anything, to try the newest trend in food or to enjoy the nightlife. This has been a result of the connectivity the L train provides. It is also the reason repairs to the Canarsie Tube are vital.

Recommendations

Rebuilding the Canarsie Tube is essential; damages from Superstorm Sandy on the 90 year-old tunnel were devastating. The challenge is how New York City and the MTA will maintain mobility between Manhattan and Brooklyn and mitigate long-term disruptions. The L is a vital artery in the transit system, providing transportation for more than 65,000 workers and access to hundreds of restaurants, bars, cultural institutions and other recreational activities.

The MTA has chosen to shut down the Canarsie tube completely for 18 months for uninterrupted construction. The L train tunnel closure presents an opportunity for New York City officials to explore alternative modes of transportation. The NYU Rudin Center recommends New York City and the MTA pursue a mix of solutions, including upgrading current infrastructure and invoking twenty-first century tools:

1. Increased subway services will assist thousands of passengers. The MTA must bolster other lines for passengers substituting this service for the L train. Williamsburg residents can board the G northbound to connect with the E, R and M and Queens Plaza. Taking the G southbound, they can connect with the A and C at Hoyt-Schermerhorn and the F at Bergen Street. These connections will all bring commuters to job centers in Manhattan. The G line currently travels far less regularly than other lines and cars on the G line break down more frequently than on other lines, according to the Straphangers Campaign. For those travelling from Manhattan, transfers will need to be allowed at Broadway for the J, M and Z. The L line shutdown will cause crowding on the G: the MTA must increase G service regularity at rush hour and prepare its car stock for the increase.

For residents living further east along the L (in Brownsville, Canarsie and East New York) the MTA must not overlook the need to increase capacities along the 3, A, C, and J, Z routes for the tens of thousands of commuters that may have otherwise stayed on the L to get into Manhattan. The MTA must allow above-ground, free transfers between the L and the 3 at Junius-Livonia and between the G and J,M at Broadway, as Brooklyn Borough President Eric Adams and transit advocates have frequently recommended.

MTA is taking a key step in anticipation of the service disruption by rehabilitating the M line. Subway services between Myrtle Ave and Middle Village/Metropolitan Ave will be disrupted for several months in 2017 to ensure that “the M has no issues of performance when the L work is going on,” MTA President and CEO Tom

Prendergast said to the NY Daily News.¹⁰ In addition, G trains will double in length, from four to eight cars, to better absorb the influx of Williamsburg and Bushwick residents that would have otherwise stayed on the L.¹¹

2. Higher-speed **bus service** should be introduced between Brooklyn and Manhattan. The Williamsburg Bridge should be equipped with a peak-hour bus-only lane to serve the high volume of weekday commuters, a model that was extremely beneficial when used after Superstorm Sandy.

3. The situation calls for **public-private partnerships with ridesharing companies** to help shuttle Brooklynites to various points in Manhattan. Bridj provides bus service between data-aggregated origins and destinations and is already operating in Boston and Washington, D.C. The service could operate on popular routes for L line Brooklyn residents to travel directly to Union Square and downtown and midtown Manhattan. UberPOOL, LyftLine and Via, on-demand ridesharing services should be tapped for additional routes. These ridesharing companies can supply additional capacity to a population that cannot be serviced purely through MTA buses. Formal partnerships for these services, in addition to a carpooling requirement on the Williamsburg Bridge, will alleviate the inevitable increase in car congestion.

4. The **East River Ferry** serviced 1.3 million riders in 2013, but the City should prepare for a large increase when the L train disruptions begin. Ferries carry 150 passengers, compared to 1,160 per L train. Service on the East River Ferry, which runs approximately every 20 minutes during rush hour, should be increased. Connecting transit should be planned accordingly to bring passengers to and from the waterfront; MetroCards should be accepted on ferries with transfers to MTA buses. Employing additional ferries and routes in time will alleviate congestion on the bridges and alternate subway lines.

5. The City should offer incentives to **bike and car shares**, like Citi Bike, ZipCar and Car2Go, to increase offerings near the bases of the Williamsburg Bridge. Bike share will reduce congestion on the streets and bridge. Car sharing will particularly help commuters traveling at off-peak hours who lack easy access to transit alternatives. Because Williamsburg offers a concentration of restaurants and nightlife, off-peak travel is highly common for the neighborhood. Promoting the sharing economy to the Williamsburg area will reduce the new allure of car ownership and service the populations traveling off-peak.

6. New York City policymakers have an opportunity to explore **entirely new modes of transportation**. This is the right time to consider a New York City gondola between the Lower East Side and Williamsburg to vastly reduce the city's reliance on climate-vulnerable tunnels. According to the developers of the East River Skyway

¹⁰ Rivoli, Dan. *M Line to be Shut Down Next Year for Repairs*. NY Daily News. March 17, 2016.

¹¹ Hakim, Veronique "Ronnie". May 5, 2016. Comments made during public meeting of MTA on Brooklyn Community Meeting.

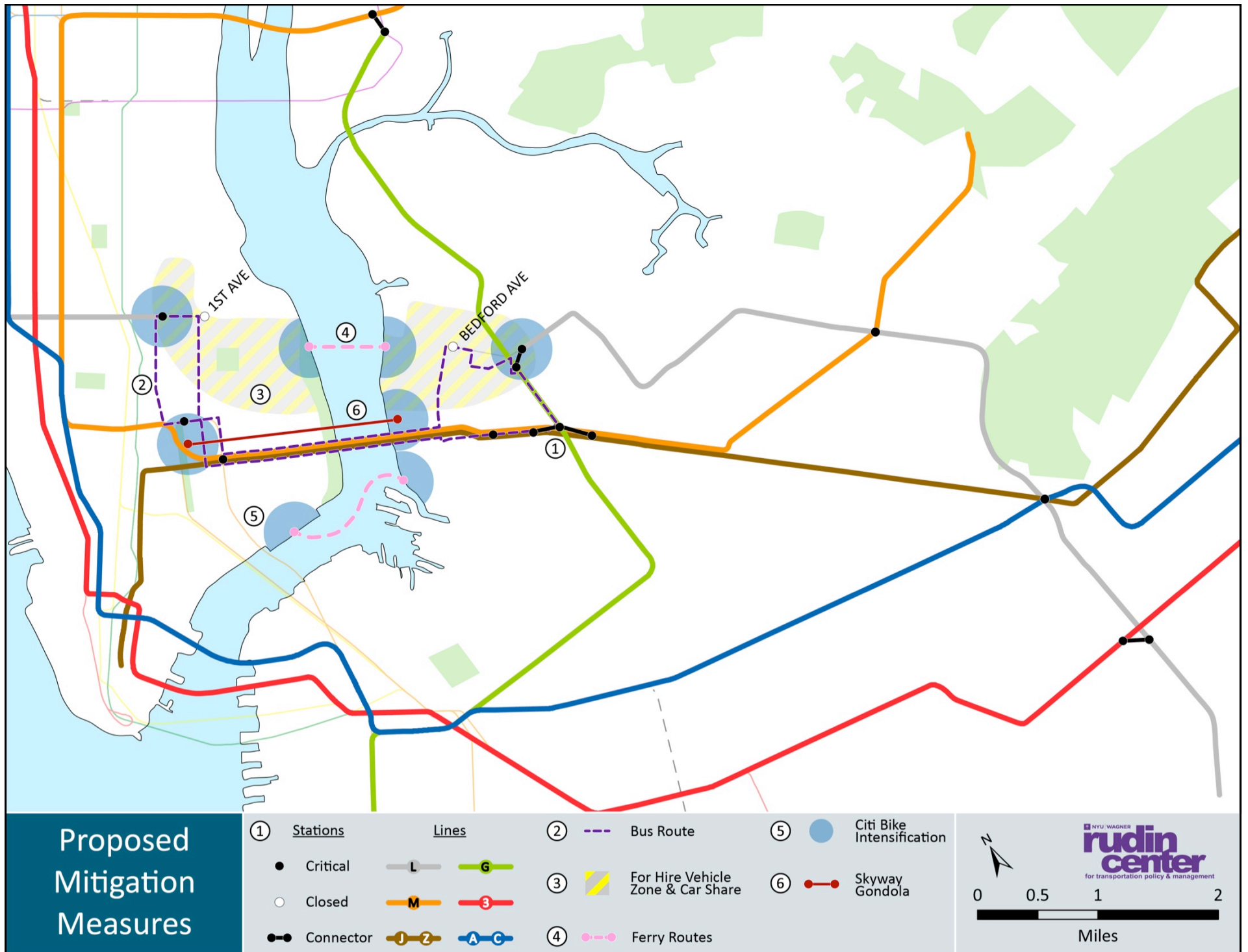
plan, a high-speed gondola would transport 5,000 people per hour in both directions. Scooter share is popular in San Francisco at \$2 per ride on Scoot Networks, but has not yet taken root in New York. Scooters are space-efficient and low-cost; their effects on congestion and air quality will be minimal. In addition, the Storm, a new electrical touring motorcycle from the Netherlands, could be deployed on a sharing basis to help minimize the congestion of full-sized vehicles. Deploying these new technology-centric modes will tap into the tech-savvy and innovative minds of Williamsburg.

7. Local chambers of commerce and business improvement districts should be actively involved in coordinating evening and weekend service to and from Williamsburg to mitigate impacts. This effort could include designated pickup and dropoff locations for ridesharing companies and taxis, discounts for dining and special packages for tourists. These benefit programs could be opted into by local restaurants, bars and shops.

Recovery efforts following Superstorm Sandy demonstrated the MTA's capacity for rebounding from a major event and ability to coordinate with other agencies. Days after the storm, in conjunction with the DOT and NYPD, high-capacity, point-to-point bus routes were established between Downtown Brooklyn and Williamsburg into Midtown Manhattan.¹² Bus Bridges, as these services become known, along with other mitigation efforts moved more than 226,000 commuters across the East River in the days following the storm. While bus bridges worked as a temporary solution, a more systematic approach would be required for extended service disruptions. Long-term closures may give the MTA and other city agencies an opportunity to work together and increase city's transportation options.

The seed has been planted; transit advocates, residents, civic groups and business owners are all eager to start planning now. This closure presents a unique opportunity to harness the emerging paratransit networks to the transit and road system to the public sector.

¹² NYC DOT, *Sustainable Streets: 2013 and Beyond*. 2013.





The Rudin Center for Transportation Policy and Management at NYU's Wagner School of Public Service explores challenges in transportation and infrastructure. The Center draws upon faculty and graduate students to conduct research on cities and mobility, information technology in transportation and access to mass transit.

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