

Aeroview of Hicksville Station area, Nassau County  
(Cinquin, R. & Metropolitan Aero-View Co, 1925).

## **Gaining Accessibility:** Long Island Railroad's East Side Access

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PLA6642: Metropolitan Planning  
December 18, 2020  
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### **Gaining Accessibility: Long Island Railroad's East Side Access**

After more than 70 years of envision, design, and development, the Long Island Railroad (LIRR) East Side Access (ESA) is scheduled to open at the end of 2022. East Side Access is New York's latest transit expansion, to allow the LIRR direct access to the Grand Central Terminal in Manhattan. This significant evolution of New York's transit framework will change New York's regional rail network forever.

The Long Island Railroad is the oldest United States railroad still operating under its original name and charter. The inauguration of the LIRR's predecessor, the Brooklyn and Jamaica Railroad, in the early 1830s, marked the half centuries of Long Island railroad networks' development and competition. The rail service in Long Island expanded considerably in the mid-19th century. All the commuter railroads in the Long Island region were purchased, consolidated, and rebranded as the Long Island Railroad in 1875-76 by railroad tycoon Conrad Poppenhusen and his successor Austin Corbin.

In 1900, the Pennsylvania Railroad (PRR) controlled the LIRR, and linked its service to the newly constructed Pennsylvania Station in West Midtown Manhattan, though building a tunnel under the East River. After World War II, the railroad industry in the United States declined and the PRR was no different. Due to financial difficulties, the PRR cut funding to the LIRR. Realizing the importance of LIRR's impact on the regional economy, New York State purchased the LIRR from PRR in 1965 (Perlmutter, 1965), and placed it under the Metropolitan Commuter Transit Authority (MCTA). In 1968, MCTA incorporated with several other transit agencies in New York and rebranded as the Metropolitan Transportation Authority (MTA). Today,

the Long Island Railroad is one of the busiest commuter railways in the world. It now has 124 stations on 11 branches, while most trains are electrified, and others are undergoing electrification and modernization, the shape of LIRR largely remained unchanged in the last one hundred years.

Historically, the Long Island Railroad supported the growth of the Long Island Region's population. In 1830, the time when rail service was first introduced to the peninsula, Long Island's population was only about 70 thousand people. Today, more than seven million people live on Long Island.

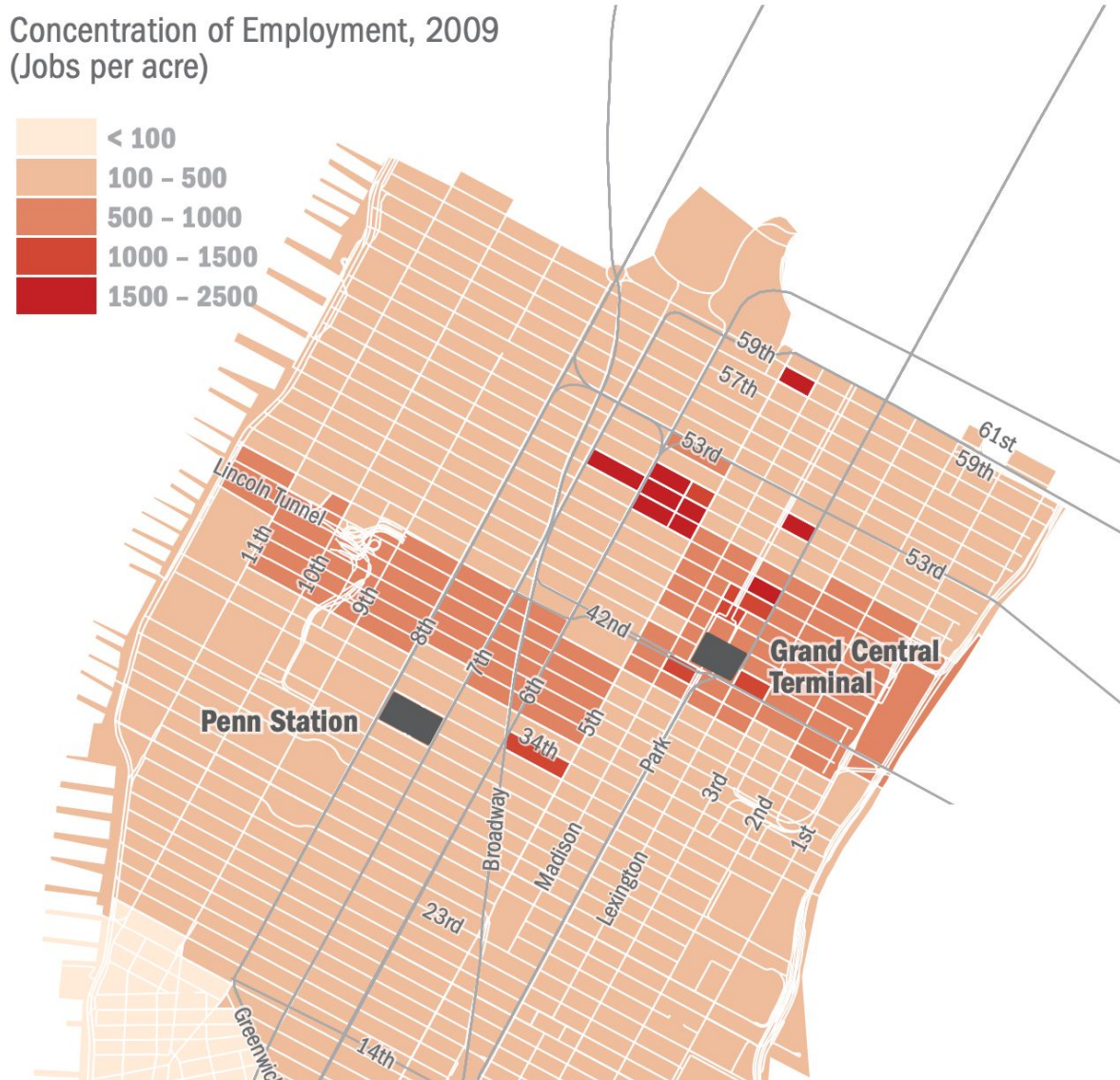
### **The Mismatch between Jobs and Transportation in Midtown Manhattan**

After World War II, manufacturing jobs left New York City, followed by the growth of white-collar jobs and office spaces in Manhattan (Federal Transit Administration, and Metropolitan Transportation Authority, 2001). East Midtown Manhattan was the center of office space growth (62 percent), as it became the new center of employment in New York City. Many of the East Midtown workers living in the Long Island Region, and an increasing number of them, living in the suburban areas, i.e., Nassau and Suffolk County, are commuting to Manhattan for jobs. The New York Metropolitan Transportation Council projected that this trend of employment and commuter growth will continue. Projections estimated that by 2020, the size of employment in Manhattan will increase 21 percent compared to 1995, and during this same period the labor force in Nassau, Suffolk, and Queens will increase 28 percent. However, this large group of daily commuters wastes approximately 15 to 30 minutes every day, because the LIRR's Manhattan terminal is located at Pennsylvania Station, causing additional travel and congestion between

Pennsylvania Station and East Midtown, where office space and employment is concentrated (see Figure 1).

**Figure 1**

*The Concentration of Employment in Midtown Manhattan Midtown, 2009*



*Source: Regional Planning Association (2013).*

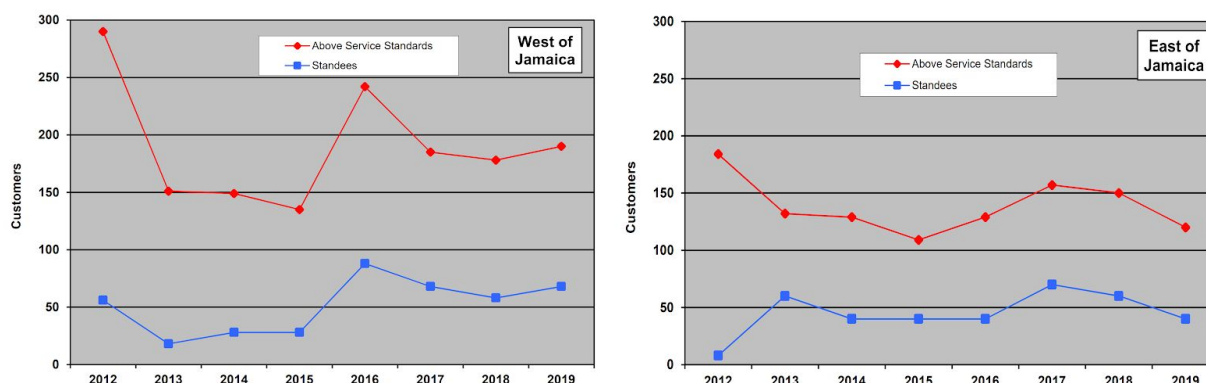
With this steady growth of commuting employees into Manhattan, the LIRR's capacity also reached a limit. The MTA projected that, by 2020, peak LIRR trains into Penn Station will be 27 percent over capacity (Federal Transit Administration and Metropolitan Transportation Authority, 2001), a bottleneck. From 2012 to 2019,



during the AM peak (between 6 to 10 AM), LIRR riders experienced a crowded train especially on the trips west of Jamaica station (see Figure 2) (Metropolitan Transportation Authority, 2020b).

**Figure 2**

*2012 - 2019 AM Peak Standees/Above Service Standards of LIRR Trains*



*Source: Metropolitan Transportation Authority (2020b).*

To accommodate this passenger growth for commuters working in the East Midtown area, the MTA proposed the East Side Access Project, which will construct a new LIRR terminal in Grand Central Terminal and will divert a number of LIRR trains to Pennsylvania Station.

### Route and Stations Development

The idea of East Side Access can be traced back to the 1950s when congestion on the Long Island transportation corridor worsened, the plan for building a new connection between Long Island and East Midtown emerged. But it was not until the 1960s, after the LIRR purchased by New York State and combined with the MTA, that a plan for a double-deck tunnel for joint Subway-LIRR operations beneath the East River matured. The construction of the 63rd Street Tunnel began in 1969 but was delayed by the 1975 City financial crisis. The upper level of the tunnel, which houses

the subway tracks, finally opened in October 1989 (Lorch, 1989). The 8,600 foot lower tunnel, reserved for LIRR trains, was finished at the same time as the upper level, but has remained unused due to the lack of connection on both the Manhattan and Queens ends.

**Figure 3**

*The Lower Level Part of the 63rd Street Tunnel, or So Called "Tunnel to Nowhere"*



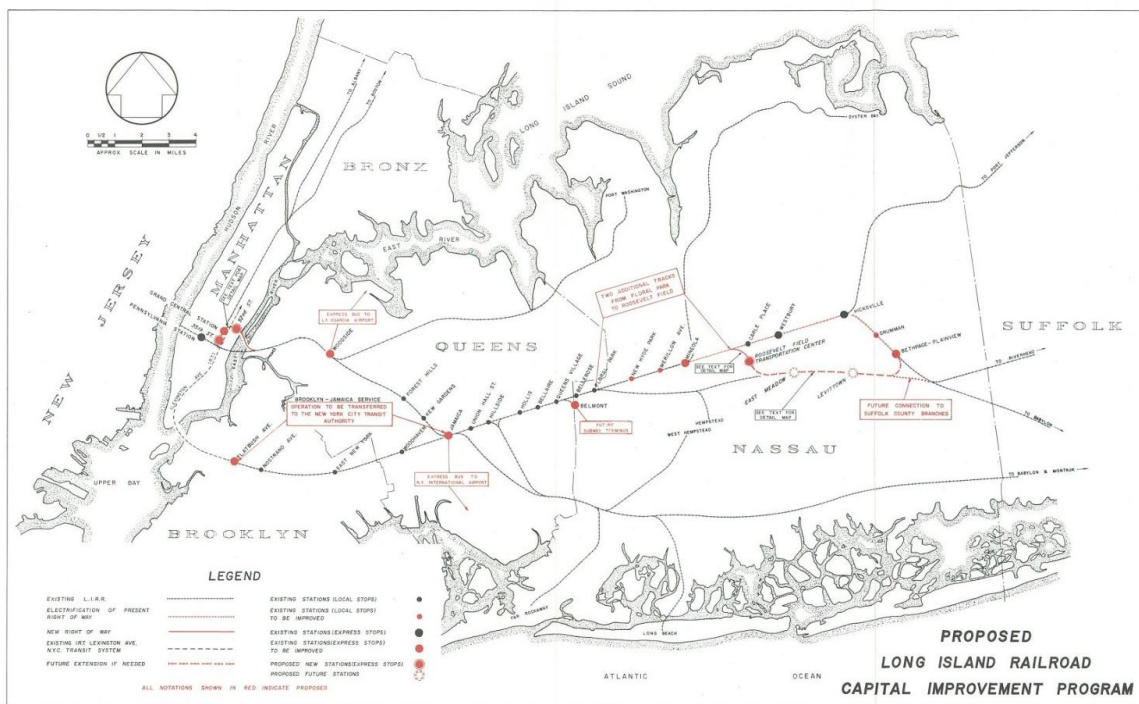
*Source: Photo by Mark M. Oring. (1976, July 2)*

In the late 1990s, calls for resuming the East Side Access project resurfaced as New York Governor George Pataki and US Senator Alfonse D'Amato showed support for the project, and potential federal subsidization made the construction more likely to commence (Pérez-Peña, 1997). In 1999, MTA's capital budget proposal revealed a \$1.6 billion LIRR connection to Grand Central Station, which marked the official revival of the ESA project. The final Environmental Impact Assessment released by Federal Transit Administration and Metropolitan Transportation Authority shows the final design of today's ESA construction. After the attacks on September 11, 2001,,

New York started to rethink its transportation system's resiliency. Believing that ESA will increase redundancy for the trains between Long Island and Manhattan through the second tunnel under the East River, the construction of ESA was accelerated. The construction of East Side Access started in 2007. Currently, stations and tunnels are scheduled to start service in 2022.

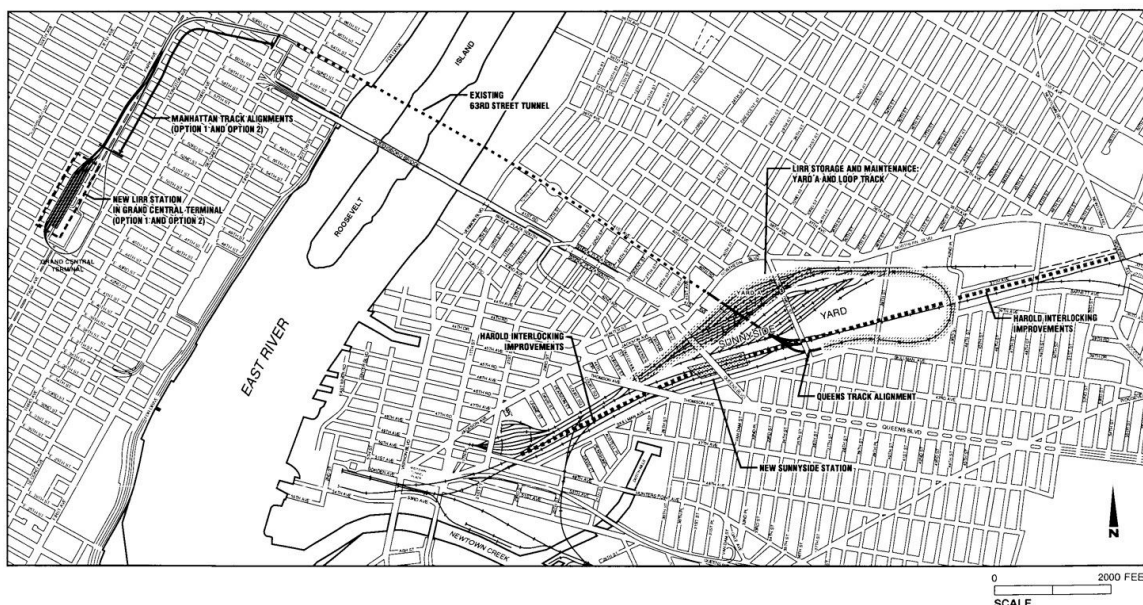
**Figure 4**

*Proposed Long Island Railroad Capital Improvement Program*



Source: Nassau County Planning Commission and Nassau County Department of Transportation and Franchises (1963).

**Figure 5**  
*Project Map of East Side Access.*



*Source: Federal Transit Administration and Metropolitan Transportation Authority (2001).*

Besides the connection between Manhattan and Queens through the tunnel under East River along 63rd Street, and the new terminal under Grand Central Terminal, the East Side Access project also includes a new Sunnyside station in Long Island City, Queens, located on the west side of Queens Boulevard and Skillman Avenue (Federal Transit Administration and Metropolitan Transportation Authority, 2001). Other associated yards, shop facilities and the Harold Interlocking (Sunnyside Yards, Long Island City) also are an important part of the ESA. The \$1 billion improvement of the Harold Interlocking will help the 800 trains which pass through it everyday experience less congestion and delays.

In the meantime, the cost of ESA is also astonishing, and has continued to grow since the project began. According to the MTA (n.d.a), the whole budget of the project is \$10.3 billion, with an estimation of finishing with the cost of \$11.1 billion.

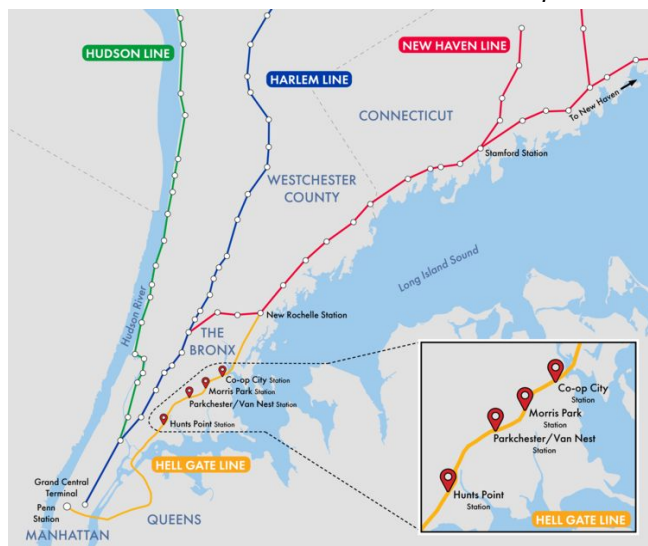


But it is worth the wait and worth the money, as New York has been waiting too long for this.

### Shortened Travel Time and Regional Transportation Impact

The impact of East Side Access is phenomenal. The MTA has estimated that 162,000 current LIRR trips will terminate at Grand Central Terminal every weekday (Vecsey, 2019). And all of these commuters will benefit from the shortened traveling time. In 2013, the Regional Planning Association (RPA) estimated that the development of East Side Access can shorten an average of 18 minutes of travel time for East Midtown workers who commute into the city on the LIRR. Also, East Side Access will free up tracks in Pennsylvania Station, opening up space for Metro North's trains to access Pennsylvania Station. The project, called Penn Station Access, will allow trains on the New Haven terminate at West Midtown Manhattan. There will also be the accompanying creation of four new Metro-North stations in East Bronx (Vecsey, 2019; Metropolitan Transportation Authority, n.d.b).

**Figure 6**  
*Metro-North Penn Station Access Map*



Source: Metropolitan Transportation Authority (n.d.b).

## **Literature Review**

### **Transportation Accessibility and Real Estate Value**

Hansen (1959) studied the relationship between accessibility to employment, shopping, and social opportunities and the residential growth in Washington, D.c. metropolitan area, it laid the foundation for understanding the impact of transportation accessibility on land use, where he defined accessibility as "potential of opportunities for interaction." In 2017 research on home sales data from the Minneapolis-St Paul metropolitan area, Iacono and Levinson research indicated the positive impact of accessibility on housing value. In a 2010 study on housing value change after New Jersey Transit's significant improvement of train service between Midtown Manhattan and North Jersey, RPA's research shows that the new rail services increased housing values by \$2,000 to \$3,000 for every minute saved in commute time. In the 2013 report prepared for ESA, RPA also estimated the ESA will increase housing value within two miles of LIRR station by \$7,300. Martinez and Viegas (2009) through building a hedonic housing price model, revealed that in the Lisbon, Portugal, metropolitan area, access to the metro line significantly impacted the property value. However, Martinez and Viegas also acknowledged difficulty in isolating the accessibility's effect on housing price from other neighborhood characteristics like educational level within 500 meters of the station, and entropy index (which measures income inequalities).

### **Land Value Capture: a rising transportation funding mechanism**

The increase of housing value will not only benefit the property owners but also generate appreciable property tax revenue for municipalities (RPA, 2010).

Medda's (2012) comprehensive review on Land Value Capture (LVC) as a mechanism and financial tool, argued that the government should implement LVC policies to generate revenue from improvements brought by the urban transportation system. The basic of LVC is to capture increments in land value resulting from the increase of accessibility brought by the public investment in the transportation system. Medda also points out that betterment tax, accessibility increment contribution (fiscal incentives), and joint development as the three major LVC mechanisms.

The property tax income could be the source of subsidizing the construction and operation of transportation systems. LVC also provides an alternative way for the government to fund and operate a public transportation system. Hui et al. (2004) introduced Hong Kong and Singapore as two of the best practice example for utilizing LVC for finance public infrastructures (i.e., Subways) and social services. The land value capturing mechanism in Hong Kong and Singapore is a combination of utilized property tax, tax on rental income, tax on a property transaction, and most importantly, revenue from land auctions and tenders.

### **Nassau County Housing Value Change after the East Side Access**

#### **Methodology**

The RPA provided an estimation in 2013, that East Side Access will bring a \$4.7 billion in housing value gain in Queens, Nassau, and Suffolk County (587,000 houses) because of the reduced travel time for Manhattan commuters. The estimation is based on the 2010 RPA research on New Jersey Transit's Access to the Region's Core (ARC) project's impact on New Jersey housing values. The ARC project aimed to provide direct access from Secaucus Junction, New Jersey to Midtown

Manhattan (RPA, 2010). While the ARC project was terminated by the New Jersey government in 2010, RPA's research shows for residential property located within two miles of stations in New Jersey, every reduced travel minute increases the housing value by an average of \$1,959. Cumulatively, the ARC project could boost an \$18 billion housing value gain in New Jersey, and provide local New Jersey municipalities \$375 million in new property tax revenue each year.

**Figure 7**  
*Housing Value Increase by Trip Time Reduction*

Distance from the station	Average increase in home values per minute reduction in trip times
<b>0 to 2 miles</b>	<b>\$1,959</b>
0 to 0.5 miles	\$2,902
0.5 to 1 mile	\$1,931
1 to 1.5 miles	\$1,310
1.5 to 2 miles	\$882

*Source: RPA (2010).*

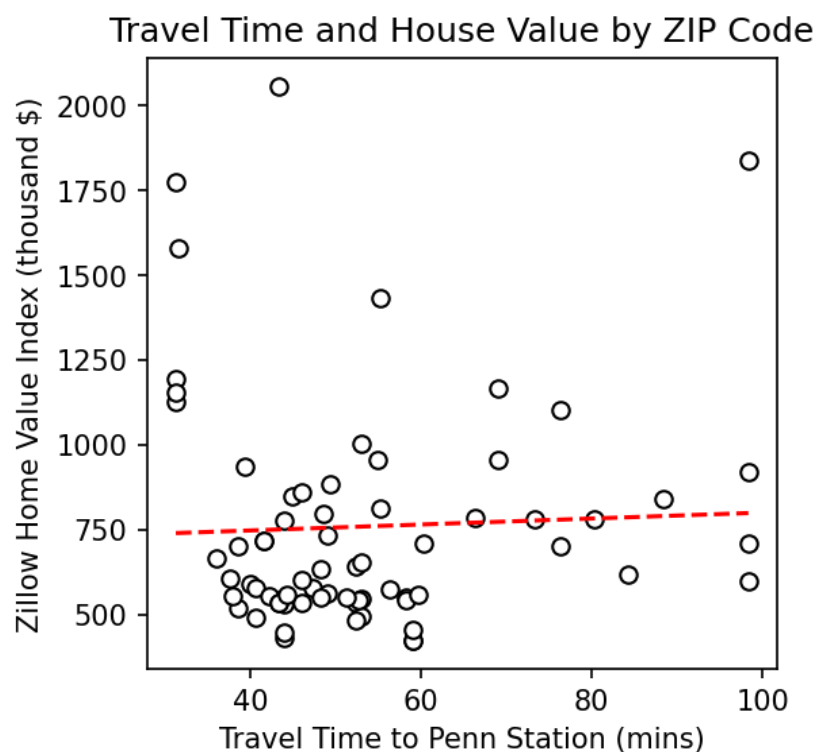
However, the RPA's estimation of economic impact brought by East Side Access is indeed conservative, only including the housing value impact led by promoted accessibility, without bringing the East Side Access' long-term effect on Long Island region's housing market and Manhattan's commercial property market into the calculation. Its estimation model is also limited in methodology, which borrowed the accessibility metrics from the 2010 research that studied the New Jersey housing market.

To estimate the housing value change in Nassau County, New York, this research tests the correlation between housing value and commute time for houses within a 73 ZIP Code Tabulation Area in Nassau County, and uses Ordinary Least Squares regression to test the impact of commute time on housing value. By training the model with current housing value in Nassau County's 73 Zip Code Tabulation Area (ZCTA) with travel time from the centroid of each ZCTA to Grand Central Terminal. According to the RPA (2013), the average traveling time for LIRR commuters with East Side Access will shorten by 18 minutes. A new set of travel time created by subtracting 18 minutes from the original traveling time will be put in, to predict the housing value for each ZCTA. The housing value of each ZIP Code in this model is simplified by integrating the *Zillow Home Value Index* (ZHVI), a smoothed measure of typical home value that reflects the value of homes in the 35th to 65th percentile range (Zillow, 2020).

## **Result**

The correlation between housing value and commute time, as shown in Figure 8, is surprisingly low. The author guesses that it is because of the unsatisfactory quality and granularity of data. The housing value should be predicted based on the hedonic model, to exclude other factors, i.e., school district, flood zone, influence to the housing price. Based on the authors' experience with using Random Forest regression to predict influenza-like-illness activities in New York City (Chen, Yang, & Zhang, 2020), machine learning models should have better results for predicting house value gain after the inauguration of ESA.



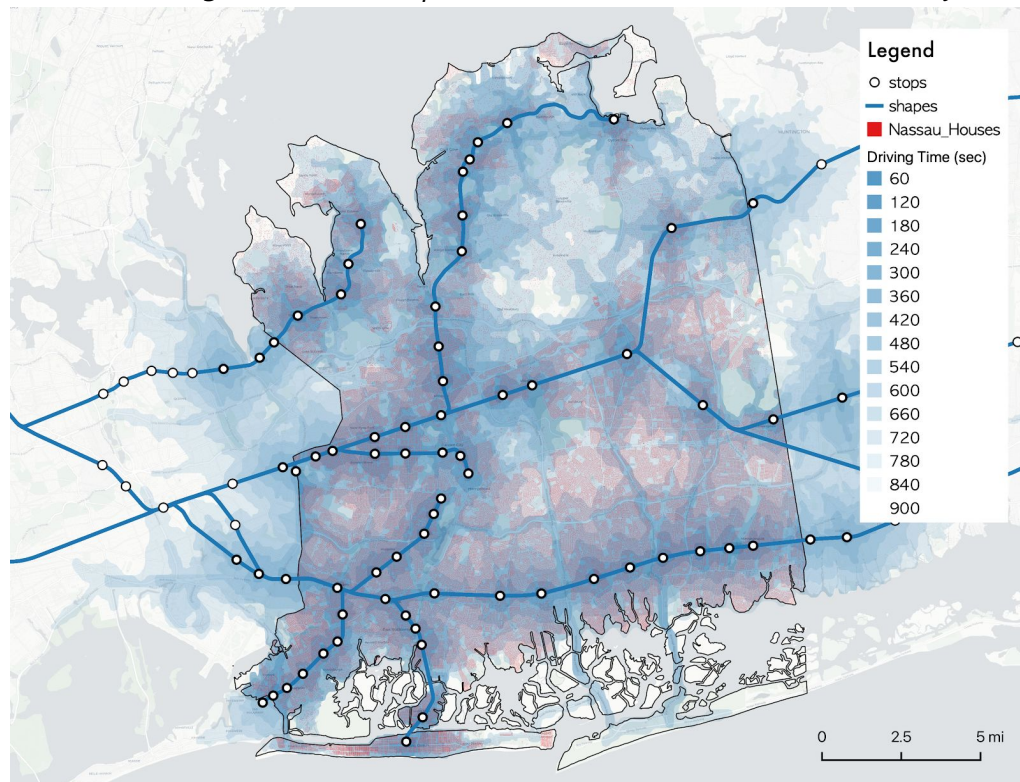
**Figure 8**

*Note: (Correlation=0.04)*

Through an isochrone map (see Figure 9) created by Hgqis on QGIS 3.16.1 with HERE API, houses with 5 mins and 10 mins driving distance were counted. About half of the houses in Nassau County fall within 5 mins driving from their nearest LIRR station, and around 95% of the houses covered within 10 mins drive from the nearest LIRR station (see Table 1).

**Figure 9**

*15mins Driving Isochrone Map from LIRR Stations, Nassau County, NY*



Source: MTA, Census Bureau, Here API, Microsoft.

**Table 1**

*Nassau County Houses within 5 mins and 10 mins Driving Time from LIRR Stations*

Driving Time from LIRR Station	Number of Houses	Percentage
5 mins	183,408	48.24%
10 mins	362,477	95.34%
Houses in Nassau County, NY	380,173	100.00%

*Notes: Driving distance buffer calculated by Hqgis on QGIS 3.16.1 with HERE API.*

### **East Side Access in the post-COVID Era**

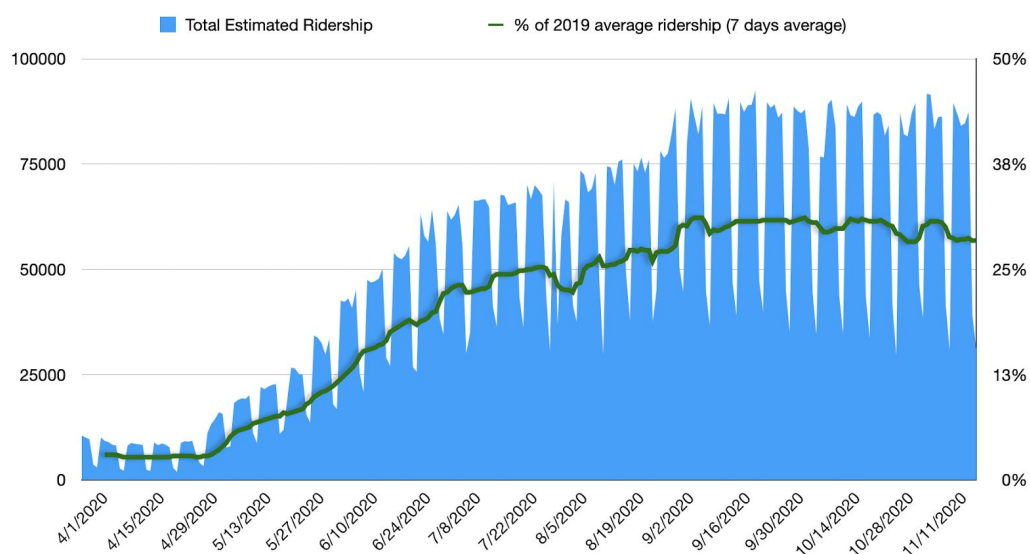
On March 7, 2020, the New York State government declared a State of Emergency following the first diagnosed case in New York State. Thirteen days later, a State-wide stay-at-home order was issued, all non-essential businesses closed and all non-essential gatherings were postponed or canceled. Along with other transit

services, the ridership of LIRR dropped dramatically this year (see Figure 10).

McKinsey estimates ridership of the whole MTA system, after recovery, may remain at 80% to 92% of pre-pandemic levels (MTA, 2020c). But the market still anticipates a bright future for the housing value in Nassau and Suffolk county according to Zillow, with the estimation of (see Figure 11).

**Figure 10**

*LIRR Ridership (April 1 - Nov 11, 2020), Compared with 2019*



Source: Metropolitan Transportation Authority (2020a)

**Figure 11**

*Zillow Housing Value Index Change (Historical and Forecast)*

**Nassau:** 4.3% 1-year change 7.7% 1-year forecast

**Suffolk:** 4.2% 1-year change 7.1% 1-year forecast



Note: Recreated from Zillow.com, retrieved on December 10, 2020.

Gensler's (2020) *US WORKPLACE SURVEY* suggested that workers prefer hybrid working models, which the survey respondent said working in the office is more productive. Under this new normal, workers may choose public transit for the office working days' commute option. The importance of East Side Access will not be hurt by COVID, and New York still needs a stronger transportation network.

### **Conclusion**

The ESA still has a bright future and it is about to inaugurate within 24 months or less. While bringing much accessibility and mobility to the Long Island-Manhattan commuters, the cost and delay of ESA should be remembered by the MTA, FTA, Amtrak, and every New York and American citizen. It represents maybe *the American way* of developing public transit infrastructure in today's America. Overdue, overpriced, and overpaid, ESA will be remembered as one of the most expensive public transportation projects in North America. It is obvious that the state government are unable to offset the construction costs from the betterment brought by ESA in the Long Island region. If development can better integrate LVC mechanisms modeled by Hong Kong and Singapore, the government will have a clearer reservation to future public transportation projects.

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