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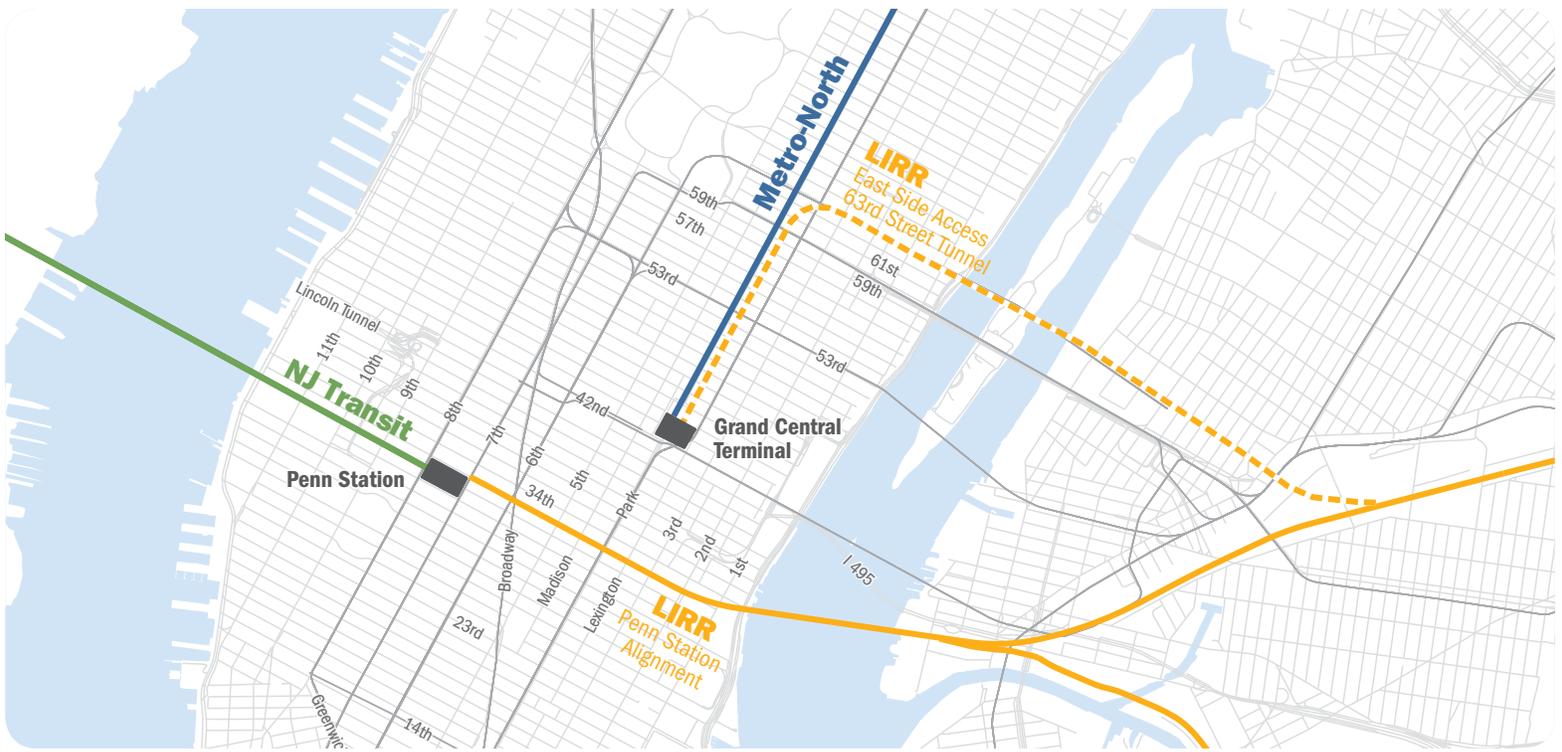
# Rail Rewards

How LIRR's Grand Central Connection  
Will Boost Home Values

January 2013



Rendering of East Side Access terminal, lower platform  
Image: MTA



## Summary

Hundreds of thousands of Long Island commuters who work on Manhattan’s East Side today face drawn-out trips to the office. Once their trains arrive at Penn Station, they must negotiate one or two overcrowded subway lines, or face a long walk, a slow bus trip or an expensive taxi ride to reach their final destination. East Side Access, Long Island Rail Road’s connection into Grand Central Terminal scheduled to open in 2019, will shorten the commutes of thousands of Long Islanders who work in East Midtown, which has the densest concentration of high-paying jobs in the country. East Side Access also will open up Long Island as a housing option for people who work in East Midtown. As the appeal of living near an LIRR station grows, so will home values.

This study demonstrates that East Side Access will shorten travel times by an average of 18 minutes a day for commuters headed to East Midtown, and increase homes values by an

average of \$7,300 for 587,000 households in Queens and Long Island. Cumulatively, East Side Access will raise homes values by \$4.7 billion.

Over time, the economic benefits of East Side Access could be even greater. Improved connections at Grand Central, other prospective transit investments on Long Island and development around station areas would further spur job growth and enhance home values further.

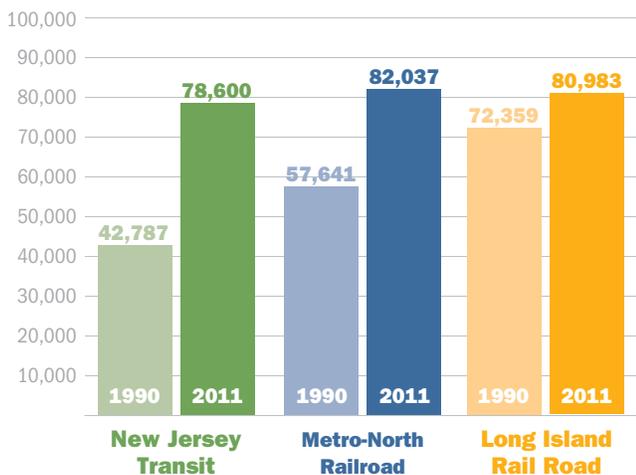
## New Service on the LIRR

Long Island was once the fastest-growing suburban area in the New York region. Nassau and Suffolk counties added 1.6 million people between 1950 and 1970, growing much faster than either the suburbs to the north in the Hudson Valley and Connecticut or to the west in New Jersey. But in the 40 years since, Long Island has gained only 300,000 people, all in Suffolk County. The mid-century burst in population helped make Long Island Rail Road the most heavily used commuter railroad in the nation, carrying far more riders than either Metro-North or New Jersey Transit. Today, this distinction is gone, and LIRR is set to soon fall to third place if current trends continue. But slow population growth on Long Island isn’t the only reason for this relative decline. While LIRR provides essentially the same service it has offered for the last two generations, the other railroads have gained riders with new connections, system expansions and other service improvements.

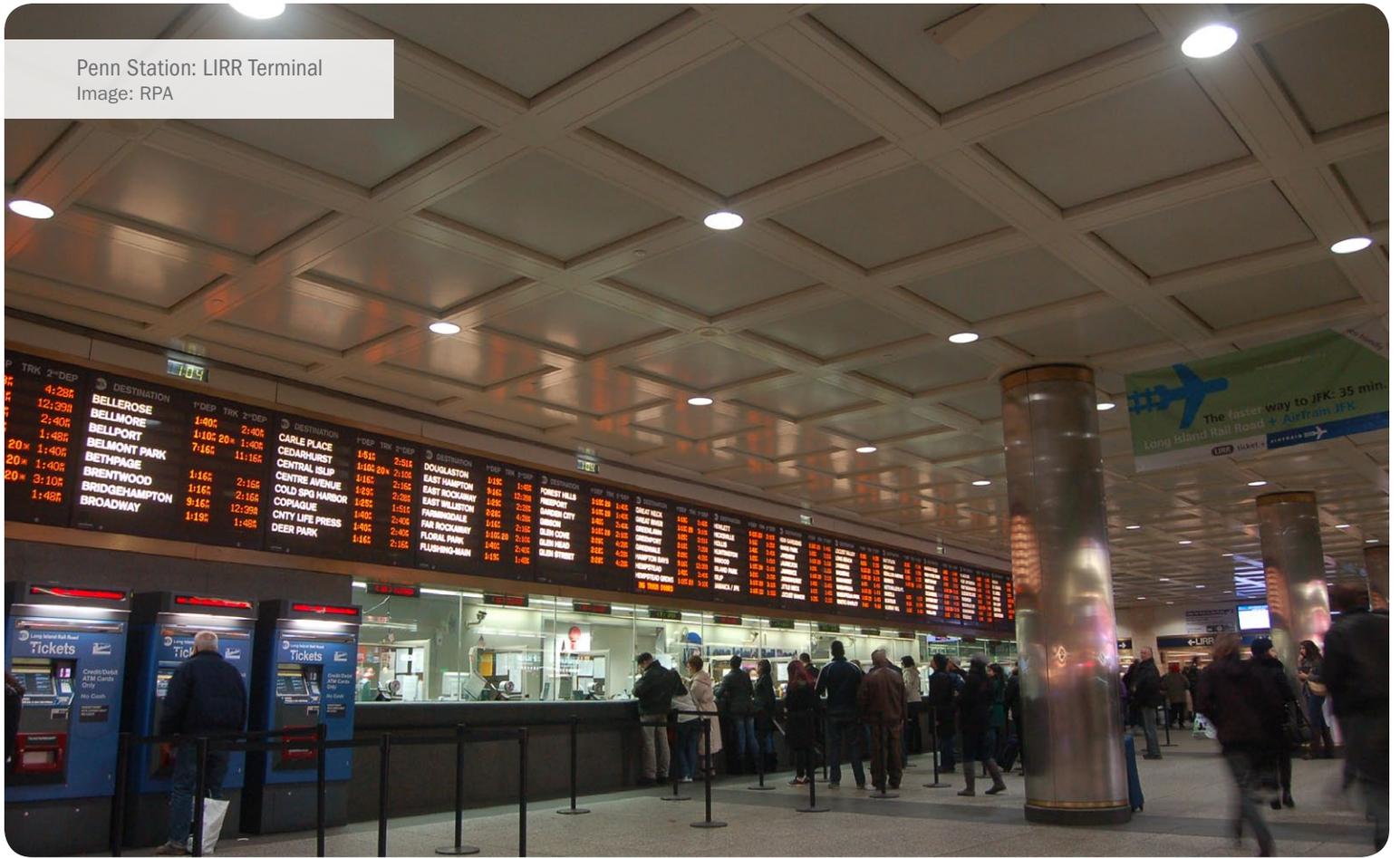
For the first time in more than a century, LIRR is set to provide a significant new improvement to its system. The East Side Access project, an investment of more than \$8 billion, will bring LIRR trains to a new terminal under Grand Central Terminal on the east side of Midtown Manhattan, home to the country’s densest concentration of jobs.

East Side Access will give Long Island a much-needed economic boost when it opens later this decade. This report estimates the effect that ESA will have on housing values and discusses the project’s other benefits, including reducing traffic and improving rail service.

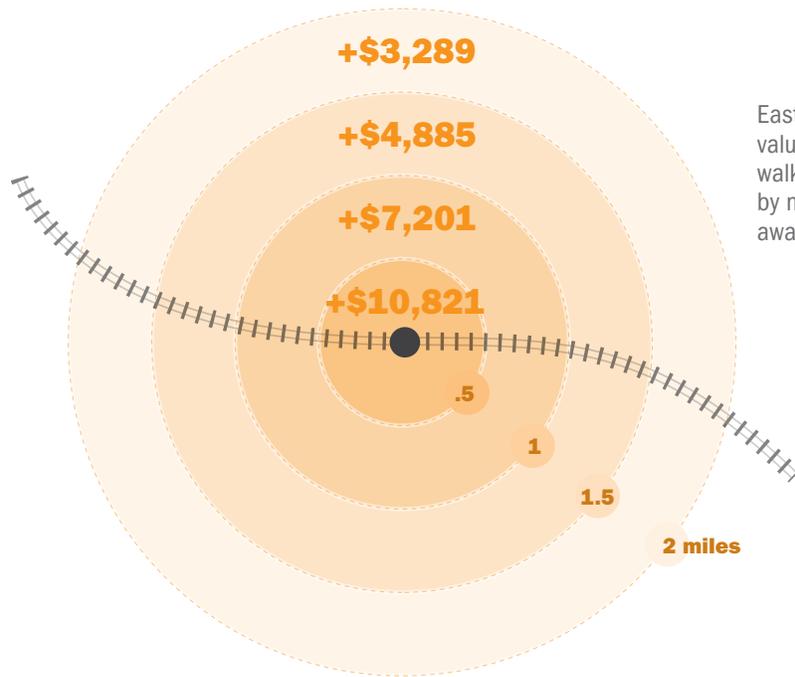
Annual Ridership of the Three New York Region Commuter Railroads (000’s)



Penn Station: LIRR Terminal  
Image: RPA



Rendering of East Side Access  
terminal, mezzanine at 46th Street  
Image: MTA



East Side Access will increase values of homes that are within walking distance of LIRR stations by nearly \$11,000. Homes further away also will gain in value.

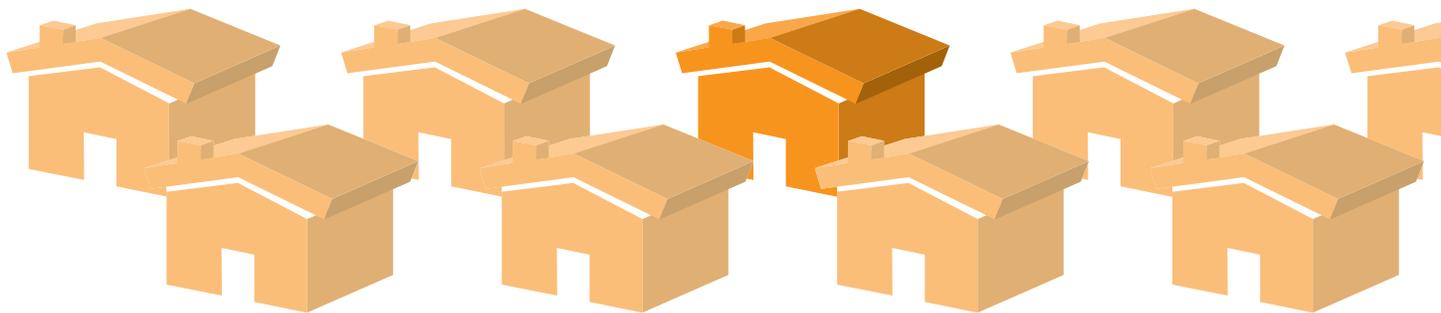
## Transit Boosts Housing Values

Good public transit improves housing values. When rail services are nearby, housing prices are higher – whether in Boston, Chicago, Philadelphia, San Francisco, Washington, D.C., or elsewhere. In Chicago, for example, housing prices were 20% higher when homes were within 1,000 feet of a train station, while in Washington, D.C., prices increased by 2.4% for each 1/10 of a mile that the homes were closer to a station.

An RPA study published in 2010 showed that in New Jersey, new rail services increased housing values significantly, with gains of \$3,000 for every minute of commuter time saved if the home was within walking distance of the train station, and \$2,000 for each minute saved for homes within a short drive. Other studies have documented similar effects in other regions of the U.S.

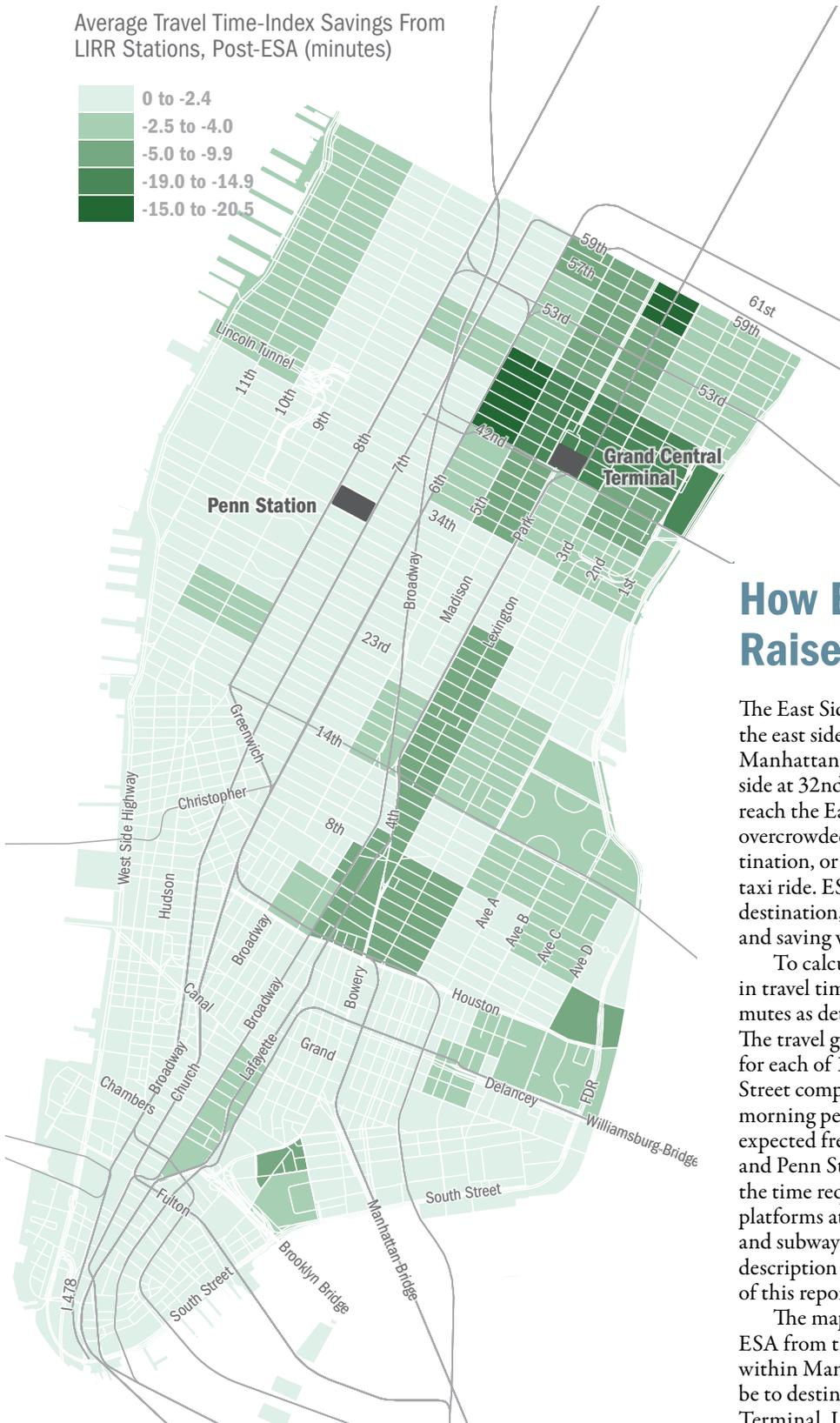
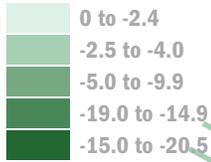
The gains in housing values in New Jersey were calculated by analyzing 53,000 housing sales before and after a series of three rail improvements in New Jersey commuting communities between 1996 and 2003.<sup>1</sup> These improvements increased home values by \$34,000 within walking distance of train stations and \$23,000 for all homes within two miles of stations.

ESA will increase housing values by **\$7,300** per home within two miles of a station.



<sup>1</sup> The ARC Effect; RPA; July 2010 <http://bit.ly/aCJ4NQ>

Average Travel Time-Index Savings From LIRR Stations, Post-ESA (minutes)



## How East Side Access Will Raise Housing Values

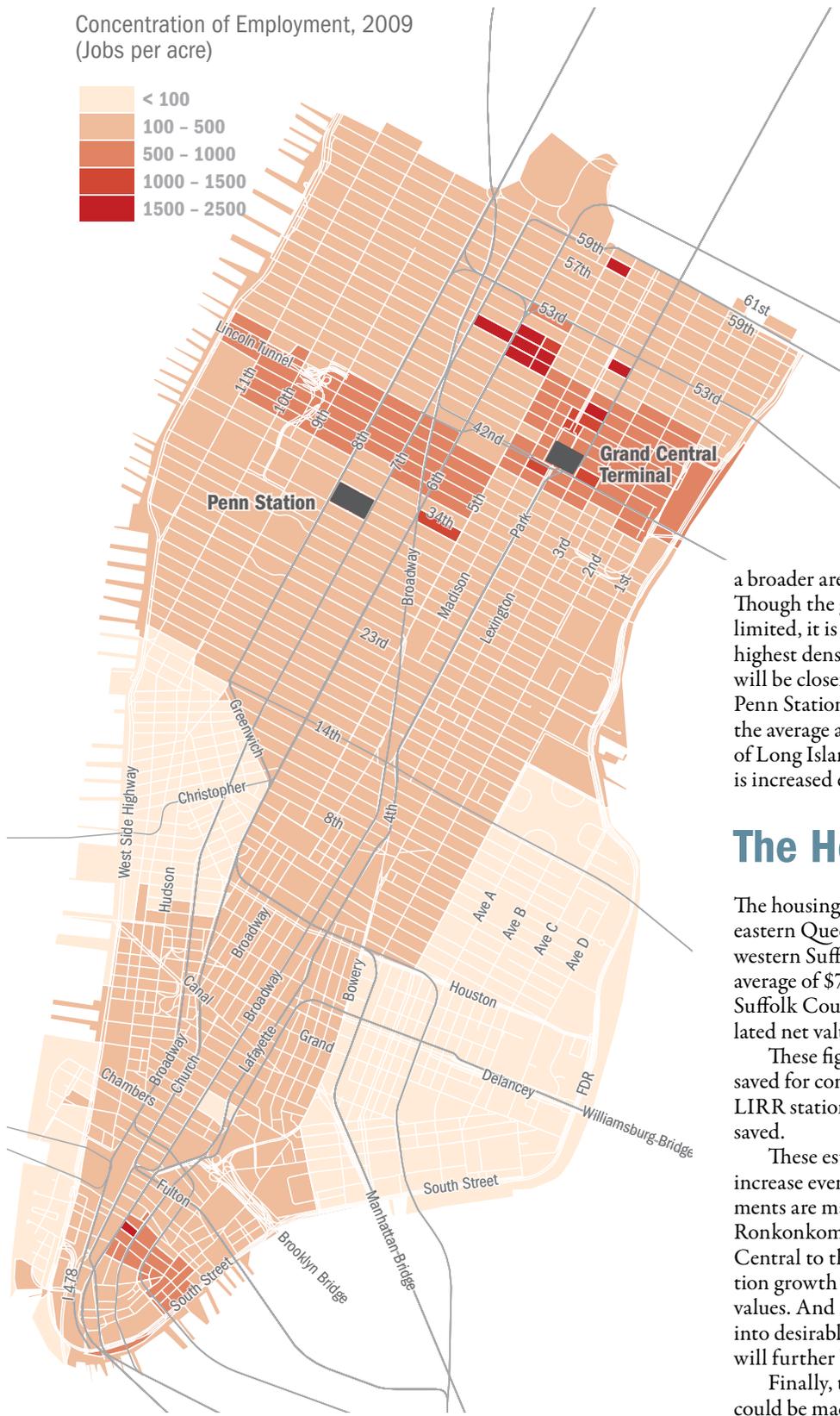
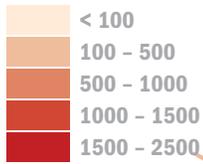
The East Side Access project will reduce travel times to the east side of Manhattan. Today, LIRR commuters to Manhattan arrive at Penn Station<sup>2</sup> on Manhattan’s west side at 32nd Street between Seventh and Eighth avenues. To reach the East Side they must negotiate either one or two overcrowded subway lines, depending on their specific destination, or face a long walk, a slow bus trip or an expensive taxi ride. ESA will deliver those commuters nearer their destination, eliminating the most arduous part of their trip and saving valuable time and money.

To calculate the effects on housing values of reductions in travel time, this analysis applied the value of shorter commutes as determined in the 2010 RPA study in New Jersey. The travel gains from East Side Access were determined for each of 125 census tracts in Manhattan below 59th Street comparing current and post-ESA train service in the morning peak period. These gains were calculated using the expected frequency of train service to both Grand Central and Penn Station, any required transfers at Jamaica, and the time required to reach each census tract from the train platforms at each terminal. Reductions in walking distances and subway fares were accounted for as well. (A complete description of the methodology is available at the conclusion of this report.)

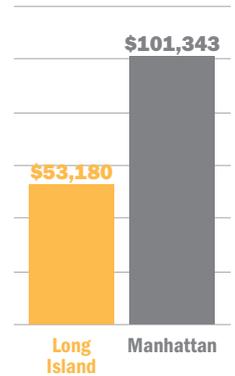
The map on page six illustrates the time savings post-ESA from train platforms on Long Island to destinations within Manhattan. As expected, the most time savings will be to destinations on the East Side nearest Grand Central Terminal. LIRR commuters traveling to East Midtown will see their trip times drop by 18 minutes a day on average; some commuters will gain as many as 42 minutes a day. Gains of 10 minutes or more are concentrated in the 40’s east of Fifth Avenue. Smaller gains are experienced in

<sup>2</sup> A few Long Island commuters travel to the East Side by using LIRR’s infrequent service to Hunters Point in Long Island City and then the #7 subway line to Manhattan, a journey that might save time over going to Penn Station and backtracking to the East Side.

Concentration of Employment, 2009  
(Jobs per acre)



Average Annual Wage, Long Island vs. Manhattan (2011)



a broader area as far as 60th Street and to the East River. Though the geographic area that will benefit from ESA is limited, it is also the area that includes some of the very highest densities of jobs. In all, 560,000 jobs in Manhattan will be closer to the ESA terminal in Grand Central than to Penn Station. Since Manhattan jobs tend to pay very well — the average annual wage in Manhattan is nearly twice that of Long Island — the value of ESA to Long Island residents is increased even more.

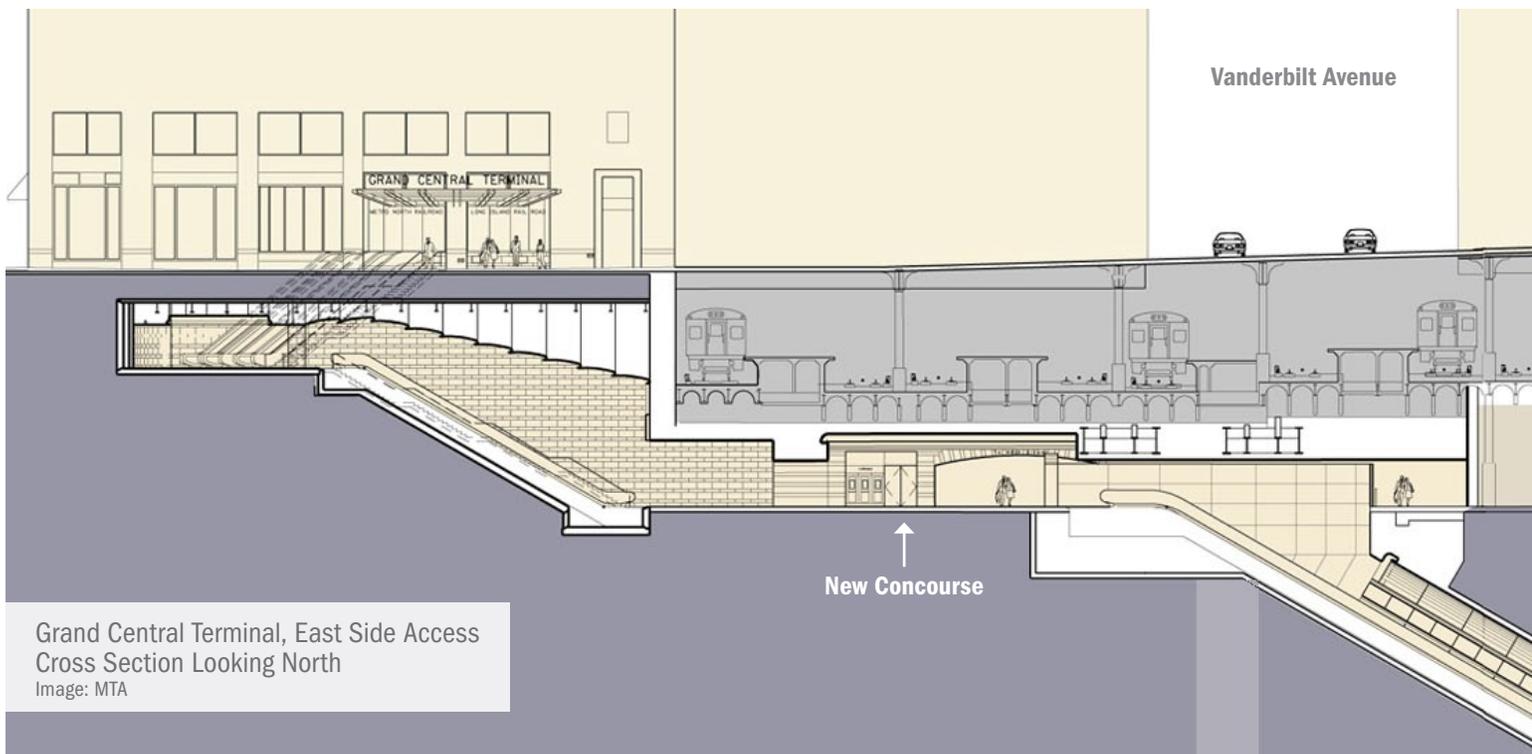
## The Housing Value Effect

The housing values for 587,000 homes — about 191,000 in eastern Queens, 314,000 in Nassau County and 82,500 in western Suffolk County — are expected to increase by an average of \$7,300, with lesser gains in central and eastern Suffolk County, as a result of East Side Access. The accumulated net value gain is projected to be \$4.7 billion.

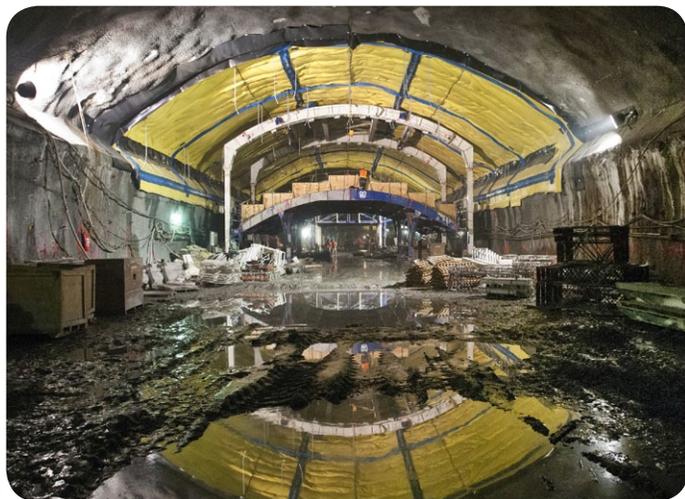
These figures were calculated by determining the time saved for commuters based on their homes' distance from LIRR stations, and assessing the per-minute value of time saved.

These estimates are conservative. Housing values could increase even more if other prospective transit improvements are made, such as the second track on LIRR's Ronkonkoma branch and an improved connection at Grand Central to the Lexington Avenue subway. Job and population growth in areas served by LIRR also could lift housing values. And in the long term, as LIRR station areas grow into desirable places to live and work, future development will further buoy housing values.

Finally, the estimates don't factor in improvements that could be made to reduce the time to enter and leave the new LIRR terminal at Grand Central. This might include new connecting corridors between the basement level of Grand Central and the adjacent subway stations. Reductions in travel time from these improvements could substantially boost the housing value calculation.



Grand Central Terminal, East Side Access  
Cross Section Looking North  
Image: MTA

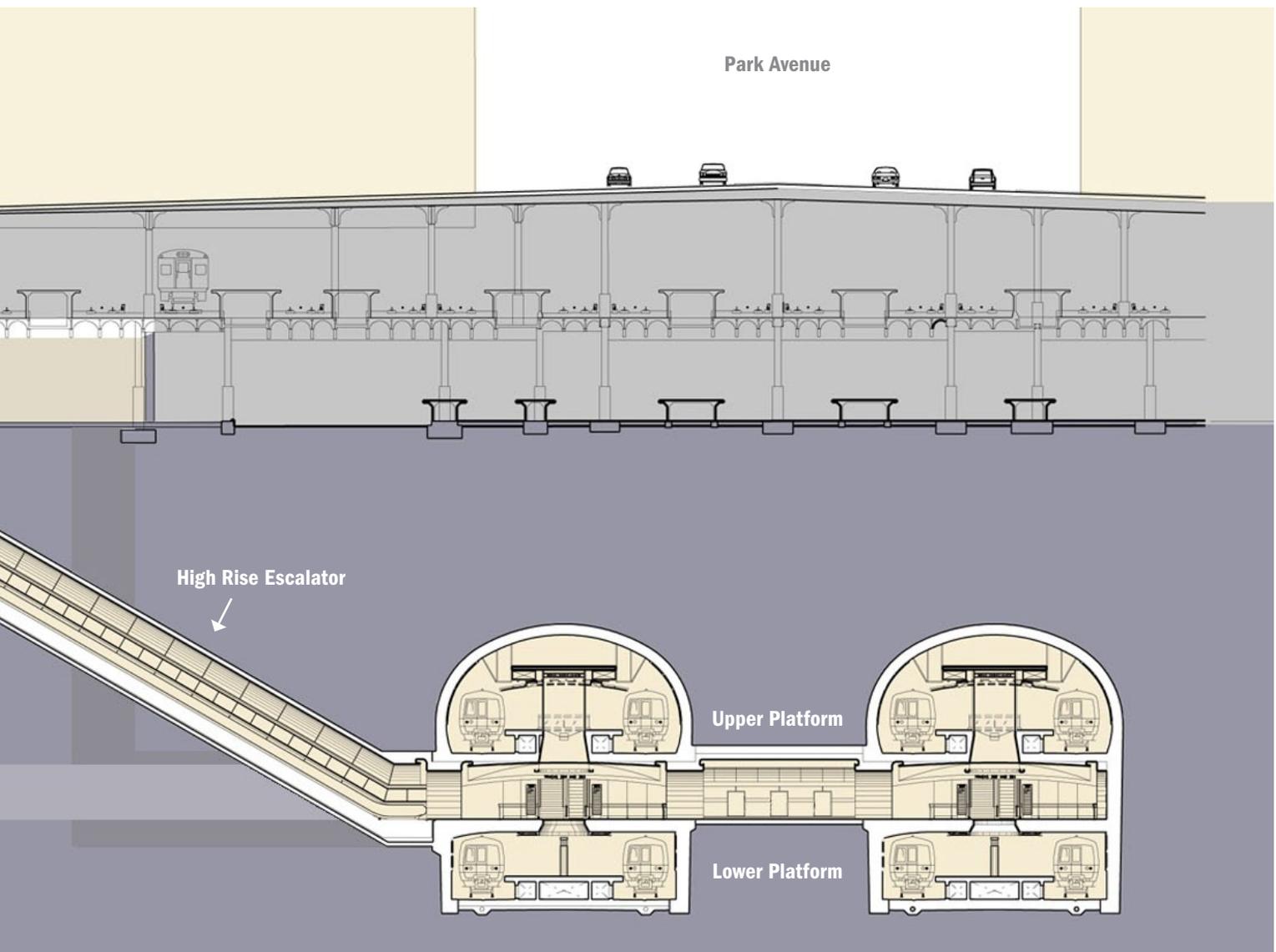


Construction of East Side Access Terminal.  
Images: MTA

## What Else Will East Side Access Do?

While this report focuses on the gains in housing values, ESA will have other advantages for Long Island and the entire metropolitan region's residents and businesses. It will add value for commuters throughout the region, on Long Island and even Long Island residents who aren't regular LIRR users.

- Jobs and incomes on Long Island will increase as the number of commuters grow and spend their salaries in stores, restaurants and other local businesses.
- Just as housing values will increase in Queens and on Long Island from the improved access to jobs, commercial real estate values in Manhattan will benefit from the improved access to workers.
- There will be fewer drivers on the roads leading to Manhattan from Long Island, as many current drivers shift to LIRR to take advantage of a railroad that brings them closer to their jobs. This will mean less road congestion for those who continue to drive, and lower vehicle emissions and greenhouse gases for everyone.
- There will be more overall rail capacity into Manhattan, growing from 36 trains to Penn Station in the peak period between 7 AM and 9:30 AM to 60 per hour to the two stations combined. This additional capacity will reduce crowding on trains, strengthen the connection between the island and the region's economic and cultural core, and spur demand for new residential and commercial development around rail stations. It also will create the possibility that some new capacity could be used to route Metro-North trains into Penn Station, an option currently being studied by the Metropolitan Transportation Authority.



- The existence of both LIRR and Metro-North rail service on the East Side will create reasonable transit choices for many trips now made by automobile. Each suburban sector – the Hudson Valley and Connecticut to the north and Long Island to the east – will be accessible to the other.
- At Penn Station, the remaining LIRR commuters will experience some congestion relief at the platform levels, on stairways and on escalators, since a substantial number of LIRR riders will shift to Grand Central Terminal.
- Similarly, there will be less subway congestion on the Seventh and Eighth Avenue subway lines as large numbers of Long Islanders shift to the new ESA access station, avoiding the West Side subway lines altogether. There will be improvements not only at the 34th Street stations, but also at the 42nd Street shuttle and the E train stops on the East Side.
- There may be less taxi use at Penn Station, too, easing traffic congestion on Seventh and Eighth avenues.
- With access to the LIRR from Metro-North and from the East Side of Manhattan, the transit choice to and from the airport using AirTrain at Jamaica becomes more attractive for those without much luggage, lowering auto and hired vehicle use.

Much of the value of East Side Access will be apparent the day the service begins, particularly for the thousands of LIRR commuters who will have a quicker and easier time getting work. Homeowners may see the value of the homes start to increase even earlier. In New Jersey, values in many places began to rise in anticipation of Midtown Direct.

Other advantages will accumulate over time. As more commuters are attracted to using the LIRR instead of their car to get to work, other drivers should see congestion begin to ease. Economic growth should get stronger, both in New York City and on Long Island, as transit service becomes even more valuable to employers as a way to attract and retain their workforce.

Over the long run, the full value of East Side Access will depend on how the region uses the new capabilities that it will create. Encouraging additional growth around the LIRR stations, whether in East Midtown where New York City is considering actions to encourage newer and taller office buildings, or on Long Island, where a number of mixed-use projects are being promoted near rail stations, is perhaps the most powerful way to maximize the economic potential of the rail investment. Other transportation investments, whether on Long Island or at the Manhattan terminals, could further reduce travel times and magnify the effects of East Side Access for commuters, homeowners and employers throughout the region.

# Methodology

## Overview

A report published by RPA in 2010 (*The ARC Effect: How better transit boosts home values & local economies*) established that reducing commute times to Manhattan increased the value of residential property within two miles of stations in New Jersey. More specifically, it concluded that for every minute that travel time to Manhattan was reduced, the value of homes increased by an average of \$1,959, with higher increases for homes nearer to the stations, as shown below.

Homes within one-half mile	\$2,902
Homes one-half to one mile	\$1,931
Homes one to one-and-a-half mile	\$1,310
Homes one-and-a-half to two miles	\$882
All homes within two miles	<b>\$1,959</b>

This analysis of East Side Access applied these per-minute values to homes in Queens, Nassau and Suffolk counties, based on the likely time savings to be brought about by ESA.

## Determining the value of a minute of travel-time saved

The value of every minute of reduced travel time was developed in Northern New Jersey and applied on Long Island. This validity of the assumption of the transferability considered a number of factors including:

- Home values in Queens and on Long Island compared with Northern New Jersey
- The correlation between home values and increases in home values in Northern New Jersey
- The share of residents who live within two miles of train stations in Queens and on Long Island compared to Northern New Jersey
- The share of Queens and Long Island residents who work in Manhattan compared to the share of Northern New Jersey residents who work in Manhattan
- The share of NJ Transit and LIRR commuters who work in different parts of Manhattan

After careful consideration, it was decided that the differences east and west of New York City were not sufficient to justify adjusting the \$2,959 per-minute value experienced in Northern New Jersey.

## Travel times

To estimate the change in travel times to Manhattan after ESA, the total travel time – that is, both time on LIRR plus time from the Manhattan terminal to the specific destination in Manhattan – was estimated, via either Grand Central Terminal or Penn Station, whichever was optimal. The calculation was done for each LIRR station to each terminal and each census tract below 59<sup>th</sup> Street in Manhattan, weighted by the use of each station and by the number of workers traveling to each census tract, the latter based on 2000 *Census Transportation Planning Package* data (the latest available). Once the LIRR times and the within-Manhattan times were combined, the total travel time differ-

ences between using the two stations were used to determine the average time gain, if any, that riders would have if they used Grand Central compared with the current trip to Penn Station.

Travel times were calculated to reflect: 1) actual travel time; 2) transfer time and convenience on the LIRR; 3) LIRR service frequency; 4) subway or bus times in Manhattan; and 5) the time and inconvenience of walking. Transfers and service frequency were translated into “minute-equivalents” so they were in the same currency as scheduled travel times, and could be added to them. Final travel times were consisted of several elements:

- The scheduled travel time to either Penn Station or the new LIRR terminal under Grand Central Terminal in minutes, for morning peak trains (i.e., those that arrive between 7 AM and 9:30 AM). Current travel times were calculated according to the current published LIRR schedules. Future travel times were estimated based on an approximation of the anticipated LIRR operating plan with ESA.
- A minute-equivalent penalty for infrequent LIRR service. Per standard modeling practice, if the average wait time was under 15 minutes (in other words, more than eight trains during the two-hour peak), the penalty was half the wait time; if the average wait time was between 15 and 30 minutes, the penalty was 7.5 minutes plus one-quarter of the wait time over 15 minutes; if the average wait time was over 30 minutes, the penalty was 11.25 minutes plus one-eighth of the wait time over 30 minutes.
- A minute-equivalent penalty for transfers. Every transfer – either between two LIRR trains, between LIRR and NYCT, or between NYCT services – incurred a penalty of three minute-equivalents.
- An additional penalty of four minutes was applied to trips that required paying an additional NYCT fare, per standard modeling practice. The source of subway and bus travel times was Google Maps, which uses General Transit Feed Specification data provided by NYCT to perform routing and scheduling operations to produce accurate transit routes and travel times. These times were calculated to reflect travel conditions during the morning peak period on a weekday.
- Walking times were calculated either using Google maps for times from the egress point from the last mode of transit, or by using a standard walking speed of 260 feet per minute for walks such as those through Grand Central’s Northern Passageways that Google Maps could not calculate. These times were then multiplied by a factor of 1.5, as per standard modeling practice.

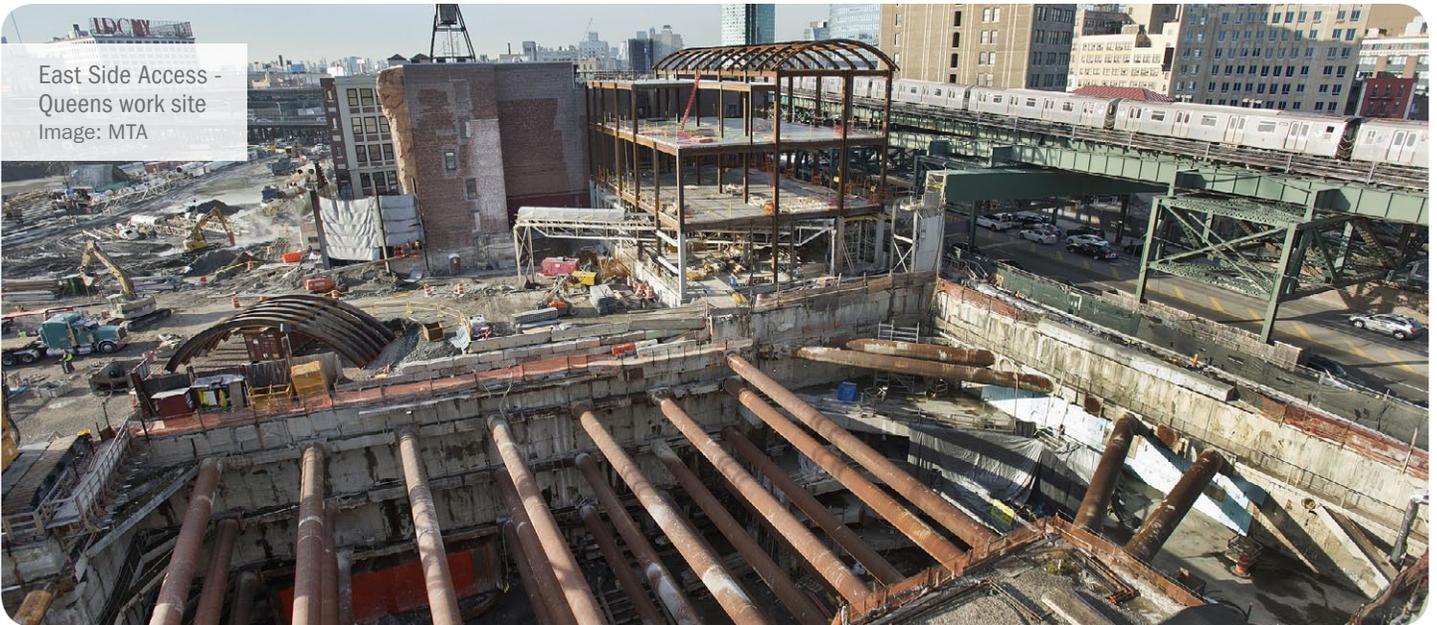
If a station had both direct and indirect service to Manhattan, only direct-train services were included in the model.

## Egress times from Penn Station and ESA terminal at Grand Central

The model included the following egress times from LIRR platforms at Penn Station (based on actual observations):

- Eighth Avenue and 32<sup>nd</sup> Street exit: 6.7 minutes
- Eighth Avenue subway: 5.3 minutes
- Seventh Avenue and 34<sup>th</sup> Street exit: 6.6 minutes
- Seventh Avenue and 32<sup>nd</sup> Street exit: 5.6 minutes
- Seventh Avenue subway: 6.1 minutes

East Side Access -  
Queens work site  
Image: MTA



Egress times from the platforms at the future LIRR terminal at Grand Central were based on LIRR's estimates:

- Madison Avenue and 47<sup>th</sup> Street: 6 minutes
- Park Avenue and 48<sup>th</sup> Street: 6 minutes
- Vanderbilt Avenue and 43<sup>rd</sup> Street: 9 minutes
- Park Avenue and 42<sup>st</sup> Street: 11 minutes
- Lexington Avenue subway: 12 minutes
- Shuttle and #7 subway: 12 minutes

### Number of homes near LIRR stations

Using housing unit data from the 2010 census, and assisted by Geographic Information Systems technology, the number of homes was determined that were located within 0.5 mile, 0.5 to 1 mile, 1 to 1.5 mile and 1.5 to 2 miles (by road) of every station in the LIRR system.

### Calculating the cumulative effect of ESA on home values

Cumulative gains in home values across the LIRR system were calculated as follows:

$$\begin{aligned}
 & [Station A \text{ travel-time improvement}] \times [Number \text{ of housing units within } 0.5 \text{ miles of station A}] \times [Average \text{ value-per-minute for homes within } 0.5 \text{ miles, i.e. } \$2,902] + \\
 & [Station A \text{ travel-time improvement}] \times [Number \text{ of housing units within } 0.5 \text{ to } 1 \text{ mile of station A}] \times [Average \text{ value-per-minute for homes within } 0.5 \text{ to } 1 \text{ mile, i.e. } \$1,931] + \\
 & \dots + \\
 & [Station B \text{ travel-time improvement}] \times [Number \text{ of housing units within } 0.5 \text{ miles of station B}] \times [Average \text{ value-per-minute for homes within } 0.5 \text{ miles, i.e. } \$2,902] + \\
 & \dots + \\
 & [Station Z \text{ travel-time improvement}] \times [Number \text{ of housing units } 1.5 \text{ to } 2 \text{ miles of station Z}] \times [Average \text{ value-per-minute for homes within } 1.5 \text{ to } 2 \text{ miles, i.e. } \$882].
 \end{aligned}$$

The gains for properties assigned to stations further than 100 minute-equivalents to a Manhattan terminal in post-ESA operating plans were graduated from 100% for stations at 100 minute-equivalents, to 0% at the furthest stations on the network. For stations in eastern Suffolk County, the prospective gain in travel time with access to East Midtown is likely to be proportionally small, given the long travel times on the LIRR and the very small number of people who commute that route. To account for this, for trips beyond 100 minute-equivalents to either terminal the gains were reduced in a proportional amount to their distance.

Gains were graduated proportionally to travel times between those two extremes. Also, those LIRR stations that are located near a subway station, mostly in Queens, were excluded from the study, as the vast majority of commuters in those areas use the subway, not LIRR.

### Calculating the average effect of ESA on home values

The average effect of ESA on the value of homes within two miles of a LIRR station, which this model estimates at \$7,305, were calculated by taking the cumulative value added of ESA for stations within 100 minute-equivalents of a Manhattan terminal and dividing it by the number of homes in that geographic area.

## Acknowledgements

This report was prepared by the staff of Regional Plan Association. Juliette Michaelson, Vice President for Strategic Initiatives, conducted the research with support from Jeffrey Zupan, Richard Barone, Christopher Jones, Jackson Whitmore and Fiona Zhu. This report was designed by Ben Oldenburg. The authors gratefully acknowledge the General Contractors Association for their generous support for this project.



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