

## The Cornerstone of East Side Access

Located deep below Park Avenue between 43rd and 48th Streets, the new Long Island Rail Road (LIRR) terminal, constructed under the existing Grand Central Terminal, will be the first major infrastructure improvement to LIRR's system in over 90 years. Escalators, elevators and stairways connecting two platform levels to a mid-level mezzanine (approximately 67,000 square feet) will also be utilized to carry passengers up to the concourse level



Mid-level mezzanine

Concourse level

(approximately 90,000 square feet) and from there to the street level. Street level entrances will be provided to the new five-block-long LIRR concourse as will connections to Grand Central Terminal, its Metro North Railroad facilities and the NYCT subway stations under 42nd Street.

The architectural design of the new East Side Access facilities, although modernist in expression, will be respectful of and consistent with the distinct architecture of Grand Central Terminal. Many of the same finish materials will be utilized as will various recognizable architectural elements such as the shallow-arched, marble-clad portal structures that define many of the terminal's major spaces.



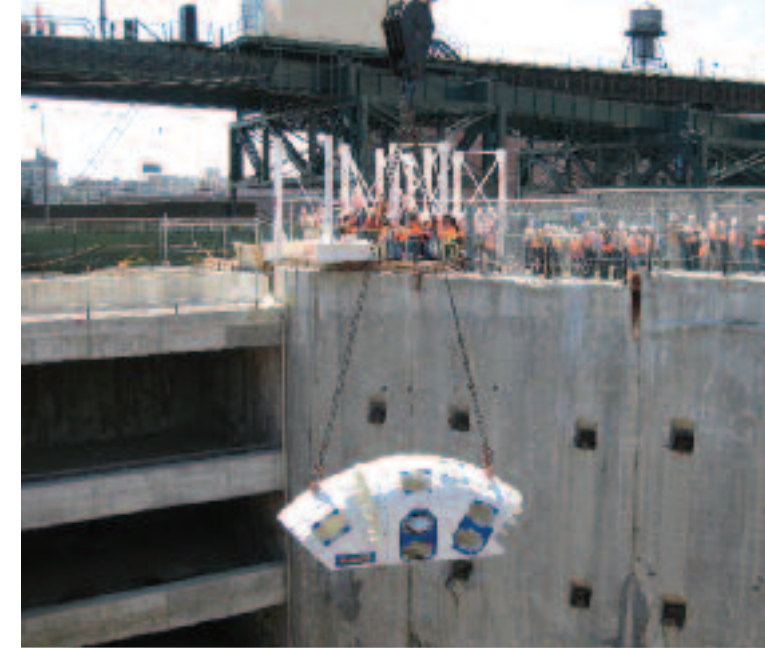
Main Concourse in Grand Central Terminal

When completed there will be a new way to commute into Manhattan from Long Island and eastern Queens. Today the LIRR is the largest commuter railroad in the country. Its daily passenger load totals 272,000 travelers — about 230,000 using Penn Station — and ridership is increasing. Serving close to 160,000 customers daily, the new connection will increase LIRR's rail capacity into Manhattan by nearly 50 percent and save commuters bound for east midtown 30 to 40 minutes a day.

The first expansion of the LIRR since it reached Penn Station in 1910, East Side Access is the culmination of decades of studies and planning. Tunneling has already begun beneath the streets of one of the busiest cities in the world. Since much of the work is far underground, surface noise and other impacts will be kept to a minimum.

## Keeping You Informed

MTA has a comprehensive public information and notification program to keep area residents and businesses informed of construction progress and how it affects them.



## East Side Access MTA Long Island Rail Road's Connection to Grand Central Terminal New York's Own Engineering Marvel



### Cover Photos

**top:** Lowering a piece of the TBM cutter head into the tunnel for assembly

**bottom:** Cavern crossover section at 51st Street

For more information go to

[www.mta.info/capconstr/esas/index.html](http://www.mta.info/capconstr/esas/index.html)

If you have any questions or wish to be added to our mailing list, please contact Lisa Blugh-Willis at 212 967-0299, or [lblugh@mta-esa.org](mailto:lblugh@mta-esa.org).



# New Tunnels Have Reached Grand Central!

Two tunnel boring machines are drilling 22-foot diameter tunnels beneath Manhattan's East Side to make way for the new Long Island Rail Road (LIRR) service to Grand Central Terminal. These new tunnels, when complete, will extend between East 38th Street and Park Avenue and the existing 63rd Street Tunnel, to allow for connection to the LIRR network in Long Island City.

Manhattan Island is formed of hard rock, known as Manhattan schist. Connecting the

western end of the existing 63rd Street Tunnel at Second Avenue to Grand Central Terminal requires drilling through more than 31,000 linear feet of rock. The two tunnel boring machines (TBMs), in use for this purpose, were customized for the project. As the TBMs advance, they install rock supports including steel rings and other supports so that mining can go on continuously.

In the second half of 2009, excavation will begin from within these tunnels to create two caverns. These spaces beneath Grand Central Terminal will create the largest mined underground terminal ever built in the U.S.



Rendering of New LIRR Concourse at Grand Central Terminal



Fuel efficient and low emission locomotive



Road header excavation of cavern



Tunnel boring machine



Conveyor belt system



Shooting shotcrete to support tunnel section

Inset photo: Drilling hole for controlled blasting of crossover cavern

## A Different Type of Tunneling in Queens

A portion of the tunnels in Queens is being excavated from the eastern end of the existing 63rd Street Tunnel using the cut-and-cover method. The remaining tunneling beneath Sunnyside Yard will be accomplished with minimal surface impact to avoid disrupting LIRR and Amtrak operations. Here, the soft ground and high water table require tunnel boring machines made specifically for these conditions, cutting through the ground while supporting the tunnel from settling, balancing the water pressure, and completing the final tunnel by installing precast concrete segments as the machine advances at the same time.



Open-cut excavation in Queens