

Dulles Corridor Metrorail Project

Tunnel Basics
Winter 2011



Tunnel Construction Continues in Tysons Corner

Inbound, outbound tunnels will connect tracks below Route 123 and Route 7 intersection

The Dulles Corridor Metrorail Project alignment includes twin 2,400-foot-long tunnels that will connect the Tysons Central 123 and Tysons Central 7 stations.

The 2,400-foot-long inbound and outbound tunnels run from the future Tysons Central 123 Station below International Drive and the cloverleaf at Route 7 and Route 123 into the Tysons Central 7 near SAIC and Marshalls. Approximately 1,700 feet of each tunnel have been excavated or mined using the New Austrian Tunneling Method (NATM, also known as Sequential Excavation Method or Sprayed



The Drill Jumbo is a specialized piece of tunneling equipment.
Photo by Dulles Corridor Metrorail Project

manufactured by Atlas Copco in Sweden, which is a state-of-the-art drilling machine. The Drill Jumbo helped construct an arched roof over the tunnel, so miners could remove rock and soil to create the tunnel opening. The rig was customized to drill and case holes with pipe, then grout the support pipes in place. The man-basket in front allows miners to work closely to the tunnel's face to feed the drills and grout the pipes.



The inbound tunnel construction located directly next to the green fence along Route 123 near International Drive.
Photo by Dulles Corridor Metrorail Project

Concrete Lining Method), which excavates and constructs the tunnel in short, sequential portions. The remaining 700 feet were excavated using the "cut-and-cover" method, and are on each end of the tunnel where the stations will be. This method allows crews to excavate and build the tunnel and then cover it.

After several months of prep work and excavation, mining on the NATM portions of the outbound tunnel began on Oct. 12, 2009. By the end of 2010, the excavation for both the inbound and outbound tunnels was completed ahead of schedule.

The tunnel operations feature some of the more fascinating pieces of equipment on the project, most of which are not seen by the public. One is the Boomer E2C 18 Drill Jumbo,



Miners feed support pipes from the Drill Jumbo's manbasket on the first day of the outbound tunnel's excavation.
Photo courtesy Dulles Transit Partners



The depth of the two tunnels ranges from seven to 30 feet below the Route 123 and Route 7 intersection near the landmark water and defense towers.

Photo by Frank Jenkins, Dulles Transit Partners



Mining for both inbound and outbound tunnels was completed last year and crews are now providing additional reinforcements.

Photo by Dulles Corridor Metrorail Project

Next Steps:

Now that mining is complete, crews are now smoothing out the concrete, installing additional reinforcements and waterproofing. Crews will install a safety walk. The tunnel is expected to be complete by the end of 2011.

Tunnel Facts:

- Each tunnel is approximately 2,400 feet long
 - 700 feet of Cut & Cover
 - 1,700 feet of NATM
- Tunnel is about 1/46th of the entire alignment of Phase 1.
- Tunnels drive through the highest natural elevation in Fairfax County.
- The NATM excavation allowed Route 123 and International Drive remained open to traffic throughout entire excavation.
- Approximately 100,000 cubic yards of earth were excavated
- Excavated material has been transported to Dulles Airport property on Route 606



The west end of the cut and cover portion site with westbound Route 7 traffic moving in the background of this photo.

Photo by Dulles Corridor Metrorail Project



Installation of a smoothing concrete layer is part of the next phase of work.

Photo by Frank Jenkins, Dulles Transit Partners



Crews for Dulles Transit Partners, the project's design-build contractor, celebrate the completion of the mining of the outbound tunnel.

Photo courtesy of Dulles Transit Partners