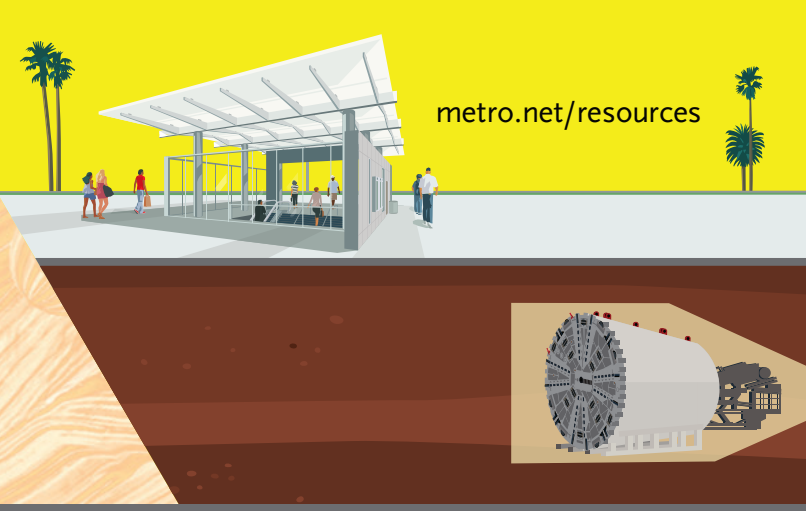
We're constructing underground stations.



CONSTRUCTION STEPS
Fact Sheet

Underground rail stations are an essential part to many of Metro's existing and upcoming rail projects. Please see the *Tunneling Fact Sheet* to learn how decisions are made whether to build underground and how tunnels are built.

Current and Future Below Ground Rail Stations

Metro currently has underground stations on the following lines:

> **Metro A Line** (Blue): The northernmost station at 7th St/Metro Center in downtown Los Angeles is below ground. *Opened 1990.*
> **Metro B/D Line** (Red/Purple): Sixteen fully underground stations from Union Station to North Hollywood and Wilshire/Western Stations. *Opened in phases 1993-2000.*
> **Metro L Line** (Gold): Two fully unground stations at Mariachi Plaza and Soto. *Opened in phases 2003 and 2016.*
> **Metro E Line** (Expo): Like the A Line, this line comes into the 7th St/Metro Center Station in downtown Los Angeles below ground. *Opened in 2012.*

In addition, Metro currently has three projects under construction that incorporate underground stations:

> **Metro Crenshaw/LAX Transit Project:** Includes three underground stations – the Expo/Crenshaw, Martin Luther King Jr. and Leimert Park Stations.
> **Metro Regional Connector**: Has a fully underground alignment with stations at Little Tokyo/Arts District, Historic Broadway and Grand Ave/Bunker Hill, and will connect to the existing 7th Street/Metro Center Station.
> **Metro Purple (D Line) Extention Transit Project**: Like the current D Line, the Extension is fully underground. Connecting at the existing Wilshire/Western Station, it adds stations at Wilshire/La Brea, Wilshire/Fairfax, Wilshire/La Cienega, Wilshire/Rodeo, Century City/Constellation, Westwood/UCLA and Westwood/VA Hospital.

Construction Overview

Construction at each station is estimated to take five to seven years. Underground stations are constructed from the surface by excavating the area to be occupied by the station box. Construction staging areas are usually located immediately adjacent to station construction sites. It is preferable to utilize two staging areas directly adjacent to each station construction area to expedite the process.

Site Preparation	Piling & Decking Installation	Excavation & Tunneling	Station Construction	Street Restoration
Utility relocation and protection	Serves as a temporary street surface	For the future station box site	Interior station design	Decking removal

Metro

The combined staging area at each station is typically about one to three acres in size. The larger areas are needed where the tunnel boring machines (TBMs) are launched and/or the earth from the tunneling between the stations will be removed. At the earth removal locations, there will be areas to temporarily store the earth and potentially sort it for appropriate disposal, areas for off-street truck loading and unloading, and equipment/construction material storage. The staging areas may also include construction trailers for offices, workshops and some employee parking.

Building Underground Stations in Five Steps

1. Site Preparation

Preparing a site for station construction typically begins with protecting or relocating any underground utilities, such as power lines, water lines, sewers, gas pipes, cable/telephone lines and storm drains. This will likely require temporary closures of portions of the street under which utilities are located and detouring traffic around the work site. Detours are often limited to weekends or non-peak periods.

2. Piling & Decking Installation

The next step is to install concrete decking that serves as the temporary street surface, allowing traffic to continue to flow while construction continues underneath. Large drills will install vertical steel piles are installed along the edges of the station box. The number of traffic lanes will be reduced, making space for the equipment and work area.

Next, horizontal steel beams are installed across the street and the concrete decking is placed on top of the beams. This requires temporary street closures with traffic being diverted to other major streets. The entire street may need to be closed for some period, or could take place over a number of weekends. Wherever possible, the decking is designed to maintain access to sidewalks and driveways.

3. Excavation & Tunneling

Once the concrete decking is in place, the traffic continues to flow above while station construction continues below. **The next steps involve removing the earth within the area that will eventually become the station box.** At the same time, shoring is installed along the edges of the excavation to support the ground around the station box.

4. Station Construction

Once excavation is completed to the bottom of the station box, construction of the inside of the station begins. The public areas of the subway stations also contain architectural design treatments and art work, information displays, lighting, signage, security monitoring devices and many other design elements.

5. Street Restoration

One of the final steps in the process is the removal of the decking and restoration of the street. This can again be done at night and on weekends, or over a shorter period by closing the street continuously and rebuilding the street on top of the station box. When construction is finished, there is little evidence on the surface other than the station entrances.

Construction Impacts and Mitigations

Clearly, subway construction cannot be accomplished without impacts. Some of the impacts from subway construction could be:

> Noise, dust, vibration or the visual appearance of construction sites
> Noise and vibration from below-ground construction activities
> Traffic impacts from temporary street closures
> Impacts to merchants near construction sites
> Traffic or other impacts from trucks hauling equipment to, or dirt from, construction sites.

The Final Environmental Impact Statement (FEIS) and/or Final Environmental Impact Report (FEIR) for the project will provide information about how the subway will be built, including impacts from the construction process. It will also identify mitigations to eliminate or reduce any of these impacts, such as:

> Restrictions on days and hours of construction
> Identifying detours for any street closures
> Specifying truck haul routes
> Utilizing noise dampening and/or decorative fencing around construction sites
> Assistance to area businesses, etc.

Please see our *Environmental Review Fact Sheet* for more information on the planning process.