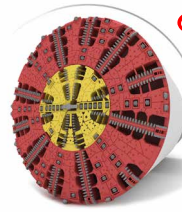


# Tunnels

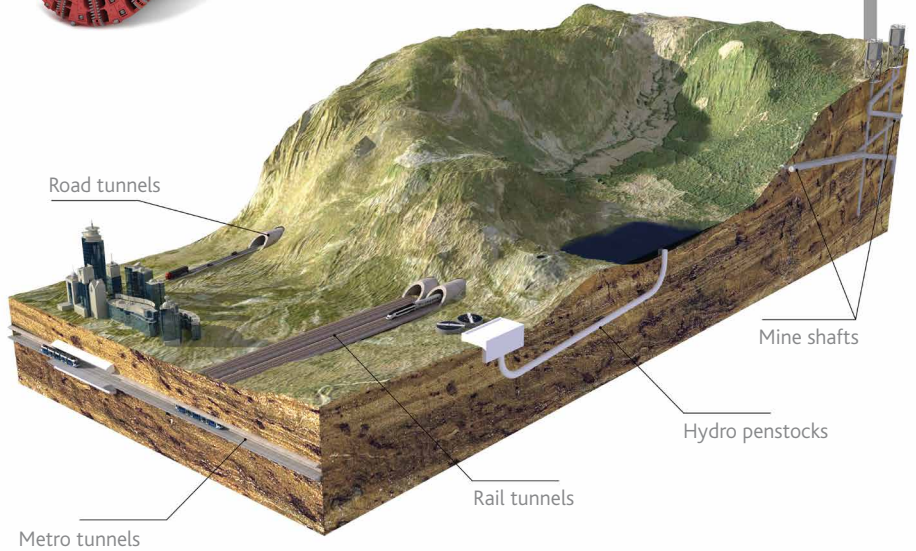
ACCIONA Infrastructure has combined a century of experience with the very latest technology to drill tunnels for roads and railways both in Spain and over a long history in other countries.



OUR TBMS

ACCIONA has 13 of its own TBMs, with diameters (Ø) ranging from 5.3 m to 15.1 m, including 8 EPBs, 2 double shields, 2 single shields and 1 open shield.

OUR CAPABILITIES



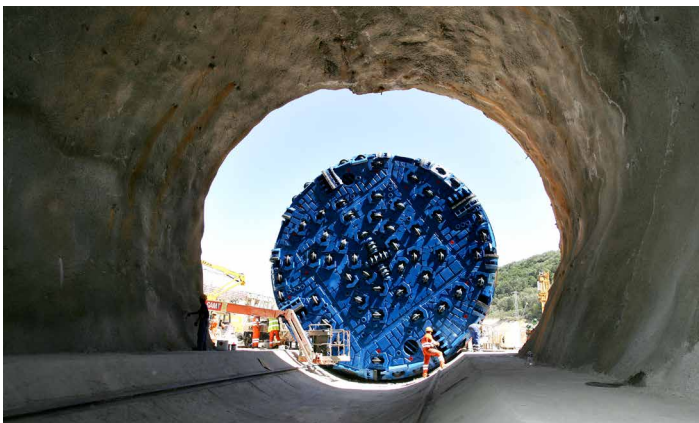
## Flagship projects



▲ **Legacy Way (Australia):** Tunnels: 2 x 4.26 km. Contract: AUD 1.5 billion.



▲ **M-30 Madrid (Spain):** M-30 Southern Bypass, North Tunnel. Length: 4.156 km. Tunnel with two levels: one for traffic, the other for maintenance.



▲ **Pajares Tunnel (Spain):** Eighth longest in the world: 1 x 15 km + 1 x 9.85 km.



▲ **Envalira Tunnel (Andorra):** Design, construction, financing, concession, maintenance and operation via free-flow system.



# Some references

## METRO:

- **L7, Madrid Metro (Spain):** Section: Canal-Valdezarza. TBM: EPB. Tunnel: 3.435 km; 9.38 m Ø.
- **L2, Bilbao Metro (Spain):** Section: Urbilaga-Sestao. Tunnel: 920 m; cavern: 108 m.
- **L5, Valencia Metro (Spain):** Section: Alameda-Ayora. TBM: EPB. Length: 2 x 4.602 km; 6.52 m Ø.
- **L8, Madrid Metro (Spain):** Section: Mar de Cristal-Nuevos Ministerios. TBM: EPB. Tunnel: 3.4 km; 9 m Ø.
- **L5, Barcelona Metro (Spain):** Section: Horta-Vall d'Hebrón. Stations: 3. Tunnel: 2.5 km.
- **Metro North, Madrid (Spain):** Stations: 7. TBM: EPB. Tunnel section 1B: 4.62 km; Tunnel section 1C: 5.49 km. 9 m Ø.
- **Metro South, Madrid (Spain):** Sections 5 and 6; TBM: EPB. Tunnel: 2.83 km; 9.36 m Ø.
- **L9, Barcelona Metro (Spain):** Stations: 5. TBM: EPB. Tunnel: 3.9 km. 12.6 m Ø.
- **Metro-train (Gijón, Spain):** Double track. TBM: EPB. Tunnel: 3.91 km. 10.6 m Ø.

## HIGH-SPEED RAIL:

- **Atlantic Axis (Galicia, Spain):** Section: Vigo-Das Maceiras. TBM: double shield. Tunnel: 2 x 5.5 km; 9.5 m Ø.
- **Guadarrama Tunnels (Madrid-Segovia, Spain):** Fifth longest in the world. Section: Madrid-Segovia. TBM: double shield. Tunnels: 1 x 14.27 km and 1 x 14 km; 9.14 m Ø.
- **Serra Llarga Tunnels (Lleida, Spain):** Section: Lleida-Martorell. Tunnels: 2 x 1.798 km.
- **Induspe Tunnel (Vitoria, Spain):** Section: Eskoriatza-Aramaio. Length: 2.224 km.
- **Saguides Tunnel (Zaragoza, Spain):** Section: Madrid-Zaragoza. Length: 1.821 km.
- **Santiago-Oroso Tunnel (Galicia, Spain):** Tunnel No. 2. Length: 3.254 km.
- **Tapioles Tunnel (Lleida, Spain):** Section: Lleida-Martorell. Length: 1.066 km.
- **Bologna Tunnels (Italy):** Urban penetration, Milan-Naples. TBM: EPB. Tunnels: 2 x 6.25 km. Length: 2.224 km; 9.14 m Ø.

## ROAD:

- **Somport International Tunnel (Spain- France):** Links both countries through the Pyrenees. It is the longest road tunnel in Spain at 8.608 km.
- **Envalira Tunnel (Andorra):** Links Andorra with France through the Pyrenees. Length: 2.879 km.
- **M-30 Southern Bypass, North Tunnel (Madrid, Spain):** TBM: EPB. Tunnel: 4.156 km. 15.2 m Ø. Biggest tunneling machine in the world used. Max. progress: 500 m/month.
- **Miravete Tunnels (Cáceres, Spain):** Section: Almaraz-Jaraicejo. Tunnels: 1 x 1.141 km and 1 x 1.154 km.
- **A-63 Highway Tunnels (Asturias, Spain):** Section: Grado-Doriga. Tunnels: 1 x 949 m and 1 x 923 m.
- **Capistrano Tunnels (Malaga, Spain):** Section: Frijiliana-Nerja. Tunnels: 1 x 1.030 km and 1 x 920 m.
- **Legacy Way (Brisbane, Australia):** TBM: double shield. Tunnels: 2 x 4.26 km; 12.4 m Ø. Record by the Joyce tunneling machine for longest distance bored in a day (48.68 m), in a week (253.8 m) and a month (858.1 m).
- **Malaga Airport (Spain):** TBM: EPB. Tunnel: 1.9 km. 9.3 m Ø.

## HYDROELECTRIC:

- **Ralco hydroelectric project (Chile):** Intake tunnel of 7 km; 9.2 m Ø. Pressure well: 9.2 m Ø.
- **Paute hydroelectric project (Ecuador):** Intake tunnel of 6 km; 5 m Ø.
- **Sewage Tunnel from La Malata to the Cape Prioriño WWTP:** TBM: open shield. Tunnel: 6.462 km. 3.7 m Ø.

## AIR INJECTION:

- **Chuquicamata Mine (Antofagasta, Chile):** Tunnels: 1 x 4.375 km + 1 x 4.32 km.

## SPECIAL PROJECT:

- **LEP project tunnel (France-Switzerland):** Tunnel in ring form. Length: 25.379 km; 4.5 m Ø. Houses the Large Electron-Positron Collider.

