Delivering complex tunnel projects around the world

Transportation | Water | Energy
Integrated services for critical connections

With more than 2,000 miles of transit, roadway, water and energy tunnel projects worldwide, we’re at the forefront of the tunneling industry.

In North America, our tunnel design experience includes high profile work like the Second Avenue Subway in New York City, the Deep Rock Tunnel Connector in Indianapolis and the La Grande hydroelectric power station in Quebec. What really sets us apart though isn’t just the number of projects we’ve delivered. It’s our outstanding performance, our consistent execution of the work, and our ability to provide fully integrated services on all aspects of large-scale tunnel design, inspection, rehabilitation and construction.

Cover:
Tuen Mun – Chek Lap Kok Link, Hong Kong, Macau, Zhuhai, China – Highways Department. At 17.6 meters (57.75 feet), this is the world’s largest TBM Tunnel.

Main:
Regional Connector Transit Corridor, Los Angeles, California, U.S. – Los Angeles County Metropolitan Transportation Authority
Quality, consistency and an integrated approach

Our tunneling team provides the integrated services needed to complete large-scale tunnel projects in their entirety, including all enabling work and associated infrastructure and facilities.

The right people with the right experience

With more than 500 tunneling professionals and 2,000 geotechnical engineers, we have all the right resources in place to provide you with tailored solutions.

Transforming innovative ideas into real-world solutions

Complex, capital-intense tunnel projects require more than a competent tunnel engineering team. Whether using conventional or alternative delivery methods, we take a proactive “build the job on paper” approach to preconstruction planning and design, so that risks are mitigated and safety is paramount.

Services for all types of tunnels

- Program management
- Construction management
- Integrated delivery
- Planning and feasibility studies
- Geotechnical site investigation
- Geophysical investigation
- Environmental site assessments and spoil disposal evaluation
- Geotechnical baseline and data reports
- Tunnel risk registers
- Soft ground, hard-rock and mixed-face ground characterization
- Tunnel and shaft initial support design
- Tunnel and shaft permanent support design
- Tunnel lining condition assessments and rehabilitation design
- Drill and blast/mechanical excavation technologies
- Microtunneling design
- Tunnel boring machine (TBM) selection and performance evaluation
- Grouting design
- Underground construction impact assessments
- Engineering cost estimates for construction
- Tunnel inspection, geologic mapping and resident engineering
- Full program and construction management services
- Dispute avoidance and resolution

2. San Francisco Central Subway Project, San Francisco, California, U.S. – San Francisco Municipal Transportation Agency

3. Tom Lantos (Devil’s Slide) Tunnels, Pacifica, California, U.S. – California Department of Transportation

4. Ottawa Light Rail Transit, Ottawa, Ontario, Canada
Connecting people and communities

From roadways to freight rail and transit, our professionals have worked on tunnels that keep people and goods on the move around the world. Here at home in North America, we’ve successfully delivered hundreds of miles of transportation tunnels including the Regional Connector and Purple Lines in Los Angeles, the Central Subway in San Francisco and the Confederation Line in Ottawa, Canada.

Planning, designing and building major tunnels and below-grade structures requires a high degree of technical expertise, and AECOM’s outstanding record of achievement demonstrates our ability to deliver for our clients.

Below:

Second Avenue Subway, New York, New York, U.S. – MTA Capital Construction & New York City Transit. (AECOM is a two-thirds partner in the Second Avenue Subway joint venture.)

Specialized services for transportation tunnels
- Rail, highway and transit tunnel design and program management
- Underground station design
- Systems planning and engineering
- Design of permanent tunnel ventilation systems
- Tunnel electrical and mechanical systems
- Jacked structures
- Immersed tube tunnel design
- Sequential excavation tunneling/New Austrian Tunnelling Method
- Tunnel security
- Fire and life safety analysis and design
- Third-party risk assessments and mitigation

“I wanted a design consultant who could not only design tunnels and stations but, more importantly, deliver the new transit system. The [AECOM] team’s approach did just that.”

— Program Manager, MTA Capital Construction
Moving water effectively and safely

When open-cut techniques on conveyance networks are not possible, we deliver cutting-edge tunnel and trenchless technology solutions. Our tunneling experience spans the siting, design, permitting and construction of all forms of intake and outfall. We offer proven approaches that have been honed across the globe on projects ranging from small diameter microtunneling and horizontal directional drilling, to the world’s largest water and combined sewer overflow tunnels.

Specialized services for water tunnels
- Water, wastewater, storm drain and combined sewer overflow tunnel design and program management
- Tunnel dewatering pump station design
- Drop shaft design
- Coastal outfalls and water intakes
- Trenchless technology for new pipe installation
- Microtunneling
- Jack and bore
- Pipe jacking
- Pipe ramming
- Horizontal directional drilling (HDD)
- Hydraulic modeling and surge analysis
- Pipeline rehabilitation and tunnel lining repair
- Odor control design

1. Blue Plains Wastewater Treatment Plant Tunnel Dewatering Pump Station and Enhanced Clarification Facility, Washington, D.C., U.S. – DC Water

2. New Irvington Tunnel, Fremont, California, U.S. – San Francisco Public Utilities Commission


4. Blacklick Creek Interceptor Sewer Tunnel, Columbus, Ohio, U.S. – Columbus Division of Sewerage & Drainage
“AECOM has been a trusted partner on the Deep Rock Tunnel Connector for more than 10 years. They’ve supported us from a technical standpoint and have demonstrated their commitment to the communities that Citizens serves.”

— Michael Miller, PE, Manager
Citizens Energy Group

5. McLoughlin Point Wastewater Treatment Plant, Vancouver Island, British Columbia, Canada – Capital Regional District


8. York-Durham Sewage System Southeast Collector Trunk Sewer, Ontario, Canada – Regional Municipalities of York and Durham
We deliver integrated tunnel solutions on major projects around the world, successfully applying all tunneling methods in all types of ground conditions.

North America
- Second Avenue Subway, New York City, U.S.
- First Avenue Utility Tunnel, New York City, U.S.
- Trans-Hudson Express Tunnel, New York City, U.S.
- JFK/AA Passenger Tunnel, New York City, U.S.
- North River and East River Tunnel Rehabilitation, New York City, U.S.
- Niagara Frontier Transportation Authority, Transit Tunnel, New York, U.S.
- Boston Central Artery/Tunnel, Massachusetts, U.S.
- New East Side Interceptor, Boston, Massachusetts, U.S.
- Silver Line Phase III, Boston, Massachusetts, U.S.
- South Boston Piers Transitway, Massachusetts, U.S.
- Boston Wastewater Effluent Outfall, Massachusetts, U.S.
- North Shore Connector, Pittsburgh, Pennsylvania, U.S.
- Baltimore Metro Rail System, Baltimore, Maryland, U.S.
- Washington Metropolitan Area Transit Authority, Washington, D.C., U.S.
- Second Avenue Tunnel, Nashville, Tennessee, U.S.
- Deep Rock Tunnel Connector, Indianapolis, Indiana, U.S.
- Tunnel and Reservoir Project, Chicago, Illinois, U.S.
- Mineral Creek Diversion Tunnel, Arizona, U.S.
- Central Subway, San Francisco, California, U.S.
- Los Angeles Metro Rail System, California, U.S.
- New Irvington Tunnel, Fremont, California, U.S.
- North City Tunnel, San Diego, California, U.S.
- Southern California Outfall Sewer, California, U.S.
- Southern California Inland Feeder Project, California, U.S.
- Romaine Hydroelectric Complex, Havre-Saint-Pierre, Quebec, Canada
- Confederation Line, Ottawa, Ontario, Canada
- Spadina Subway Extension, Toronto, Ontario, Canada
- Eglinton Crosstown LRT, Toronto, Ontario, Canada
- Coxwell STS Bypass Sewer Tunnel, Toronto, Ontario, Canada
- Southeast Collector Trunk Sewer, York and Durham Regions, Ontario, Canada
- Bowness Sanitary Offload Trunk, Calgary, Alberta, Canada

South America
- Tren Urbano Rail System, Puerto Rico
- San Antonio Channel Crossing, Puerto Rico
- San Francisco Hydroelectric Project, Equador
- Torrata River Flood Control Project, Peru
- Lima Metro Rail Line 2, Peru
- Alfalfal Hydroelectric Project, Chile
Europe
- London Thames Tideway, Lee Tunnels, U.K.
- Channel Tunnel, U.K.
- Jubilee Line Extension, U.K.
- Mansfield Sewers, U.K.
- London Ring Main, U.K.
- Swansea Bay, U.K.
- CrossRail, U.K.
- Limerick, Ireland
- Westerschelde, The Netherlands
- HSL Groene Hart, The Netherlands
- Copenhagen Metro Stages 1 and 2A, Denmark
- Kremasta Hydroelectric Project, Greece
- Ričice- Peču, HW Corridor, Zenica Bypass, Bosnia and Herzegovina

Asia
- Chongming South Channel Tunnel, China
- Bund Tunnel, China
- Zhoutouzui Immersed Tunnel, China
- Hong Kong-Zhuhai-Macao Bridge Link, Hong Kong
- Tueng Mun- Chek Lap Kok Link, Hong Kong
- Liantang/Hong Yuen Tai BCP, Hong Kong
- Central-Wan Chai Bypass Link, Hong Kong
- MTR(SIL)/MIL/KE1/SCL/SCL, Hong Kong
- Hong Kong West Drainage Tunnel, Hong Kong
- Lai Chi Kok Transfer Scheme, Hong Kong
- HATS, Stage 2A, Hong Kong
- Underground Space Study, Hong Kong
- Tseung Kwan O- Lam Tin Tunnel, Hong Kong
- West Rail- Tai Lam Tunnel, Hong Kong
- Circle Line Stage 2, Singapore
- DTSS T-01, T-02, T-05, T-06, Singapore
- North Eastern Metro Line, Singapore
- Changi Airport, Singapore
- NEL C703, C704 and C705, Singapore
- Marina Line CB24 and CB25, Singapore
- Deep Tunnel Sewer T-03 and T-04, Singapore
- Bangkok MRT South, Thailand
- Nam Theun 1 Hydroelectric Power, Central Laos P.D.R.

Middle East
- Khayam Main Drainage, Iran
- Doha Metro, Qatar
- IDRIS, Doha, Qatar
- Riyadh Metro, Saudi Arabia
- Jeddah Metro, Saudi Arabia
- First Road Tunnels, United Arab Emirates
- Abu Dhabi Metro Study, United Arab Emirates
- Abu Dhabi Metro, United Arab Emirates
- STEP, Abu Dhabi, United Arab Emirates
- Dubai Metro, United Arab Emirates

India
- Chennai Metro, India
- Cuttack Interceptor Sewage Project, India
- Delhi Metro, India
- Jiribam-Tupul Rail Tunnels, India
- Kolkata Metro East West Corridor, India
- Sivok-Rangpo Rail Tunnels, India
- Mumbai Metro line-3, India
- Coastal Road Tunnel, Mumbai, India
- Tikujiniwadi- Borivali Road Tunnel, Mumbai, India
- Delhi Interceptor Sewage Project Package P2 and P3, India
- Panvel-Karjat, Central railway, India
- Surya Bulk Water Supply Scheme, Maharashtra, India
- Sanganeri Gate to Jorawar Singh Gate Road Tunnel, India

Australia & New Zealand
- Eastern Distributor, New South Wales
- Cross City Tunnel, New South Wales
- M5 East and M5 East Duplication, New South Wales
- New Southern Railway, New South Wales
- Parramatta Rail Link, New South Wales
- City West Cable Tunnel, New South Wales
- Sydney Desalination Plant, New South Wales
- Tittenbar- Ewingsdale, New South Wales
- M2 widening, New South Wales
- NewMetroRail Perth, Western Australia
- Graham Farmer Freeway, Western Australia
- Bogong Hydropower, Victoria
- Heidelberg Rail Duplication Study, Victoria
- City Link Tunnel, Victoria
- Crafer's Highway, Southern Australia

- Cross River Rail, Queensland
- CLEM7, Queensland
- Inner City Rail Capacity Study, Queensland
- Airport Link, Queensland
- Olympic Dam Box Cut, Queensland
- Kestrel Mine Extension Box Cut, Queensland
- Acacia Ridge Pipe-Jack, Queensland
- Rosedale Outfall, New Zealand
- CBD Rail Study, New Zealand
- Central Interceptor, New Zealand
- Auckland Second Waitemata Harbour Crossing, New Zealand
- Wellington Tunnel Alliance, New Zealand
- Rockwater Hydro Study, New Zealand
- South Western Interceptor, New Zealand
Delivering innovative solutions and specialized tunnel services

We understand that specialized services are vital to a well-executed and successfully delivered project. That’s why our complex tunnel practice includes tunnel and underground structures professionals who are recognized for their work on many of the world’s landmark tunnels. We bring extensive design and construction management knowledge, including experience with alternative delivery projects.

At the forefront of technological achievements in North America

- First U.S. use of ground freezing and compensatory grout in lieu of underpinning for a transit tunnel (Boston Transitway)
- First U.S. use of deep soil mixing for permanent tunnel foundations (Boston Central Artery/Tunnel)
- First mined transit station in an urban location (Tren Urbano)
- First use of segmented precast concrete segments with special sections
- First design of joint seals in seismically-active Southern California

1. Chongming South Channel Tunnel, Shanghai, China – Shanghai Municipal Government
2. Hong Kong–Zhuhai–Macau Bridge (HKZMB) Immersed Tunnel, Lingdingyang, Pearl River, China – Hong Kong-Zhuhai-Macao Bridge Authority
3. Caldecott Tunnel Ventilation and Fire Life Safety, Oakland to Orinda, California, U.S. – California Department of Transportation
4. Riyadh Metro, Riyadh, Saudi Arabia – Arriyadh Development Authority
Specialized tunnel services and expertise

- 3-D modeling and finite element analyses
- Computational fluid dynamics
- Design-build partnering and tender design
- Emergency response
- Evacuation modeling
- Fire and safety analysis and design
- Fire compartments design and escape routes
- Flood protection
- Geophysical investigation
- Groundwater control and pollutant migration
- Hydrogeological Investigation
- Immersed tube tunnels
- In-situ and laboratory test planning
- In-situ borehole geophysics
- Leakage control and waterproofing design
- Liquefaction study and mitigation design
- Mechanical excavation technologies
- Microtunneling
- Pre-bid construction analysis
- Rail tunnel pressure transients
- Safety and security
- Seismic analysis design and damage assessments
- Sequential excavation tunneling
- Settlement and soil deformation analysis
- Soil stabilization and ground improvements
- Soil and structure interaction
- Subway environment simulation
- TBM selection and performance evaluation
- Tunnel inspection
- Tunnel ventilation
- Underground caverns
- Underground construction impact assessments
- Underpinning

5. Delhi Metro, National Capital Region, India – Delhi Metro Rail Corporation
6. Clem Jones Tunnel (CLEM7) Southern Portal, Brisbane, Australia – River City Motorway Pty Ltd.
7. Romaine Hydroelectric Powerhouse, Québec, Canada – Hydro-Québec
About AECOM

AECOM is the world’s premier infrastructure firm, delivering professional services across the project lifecycle – from planning, design and engineering to consulting and construction management. We partner with our clients in the public and private sectors to solve their most complex challenges and build legacies for generations to come. On projects spanning transportation, buildings, water, governments, energy and the environment, our teams are driven by a common purpose to deliver a better world. AECOM is a Fortune 500 firm with revenue of approximately $20.2 billion during fiscal year 2019. See how we deliver what others can only imagine at aecom.com and @AECOM.