

United States



Name: Underground Construction Association (UCA of SME)

Type of Structure: Open association

Number of Members: 1,398 members, 36 corporate members

ASSOCIATION ACTIVITIES DURING 2018 AND TO DATE

Throughout 2018 and to date, the UCA of SME continued to promote the wise, efficient and sustainable development and use of underground space. Some of the ways that we are accomplishing this are:

- 2018 and 2019 George Fox Conferences. These one-day conferences provide concise information on emerging technologies, project updates, and future planning.
- Provided numerous student scholarships for attendance of the Rapid Excavation and Tunneling Conference (RETC).
- 2018 Cutting Edge Conference. Annual two-day conference to

explore technical advancements and innovations in the industry. This year's event featured a working site visit organized and promoted by our Young Members group.

- Our Young Members group also presented monthly webinars on various topics of interest to our developing associates.
- Published four editions of our magazine, "Tunneling & Underground Construction".
- Held the North American Tunneling (NAT) Conference, UCA's biennial technical event. With over 1,100 attendees, the 5-day conference offerings included short courses, technical sessions, panel discussions,

technical field trips and exhibits from the many suppliers and specialty subcontractors that service the U.S. tunneling industry.

- Held our inaugural "Teach the Professor" course in conjunction with NAT Conference. This course is designed to educate professors on the underground construction industry and give them a suite of instructional tools for direct integration into their university courses. This will result in additional exposure to tunneling careers at both the undergraduate and graduate student levels. Our first "class" featured 10 professors from various colleges and universities around the United States.
- Replenishment funding was approved for the joint UCA/ASCE "Tunnel Tour" program. This program is a key element of our education and student outreach initiative. In the short history of this effort, 25 underground construction projects and 15 university visits have been conducted.
- Realized a 7% decrease in membership within the past 12 months.

CURRENT TUNNELLING ACTIVITIES

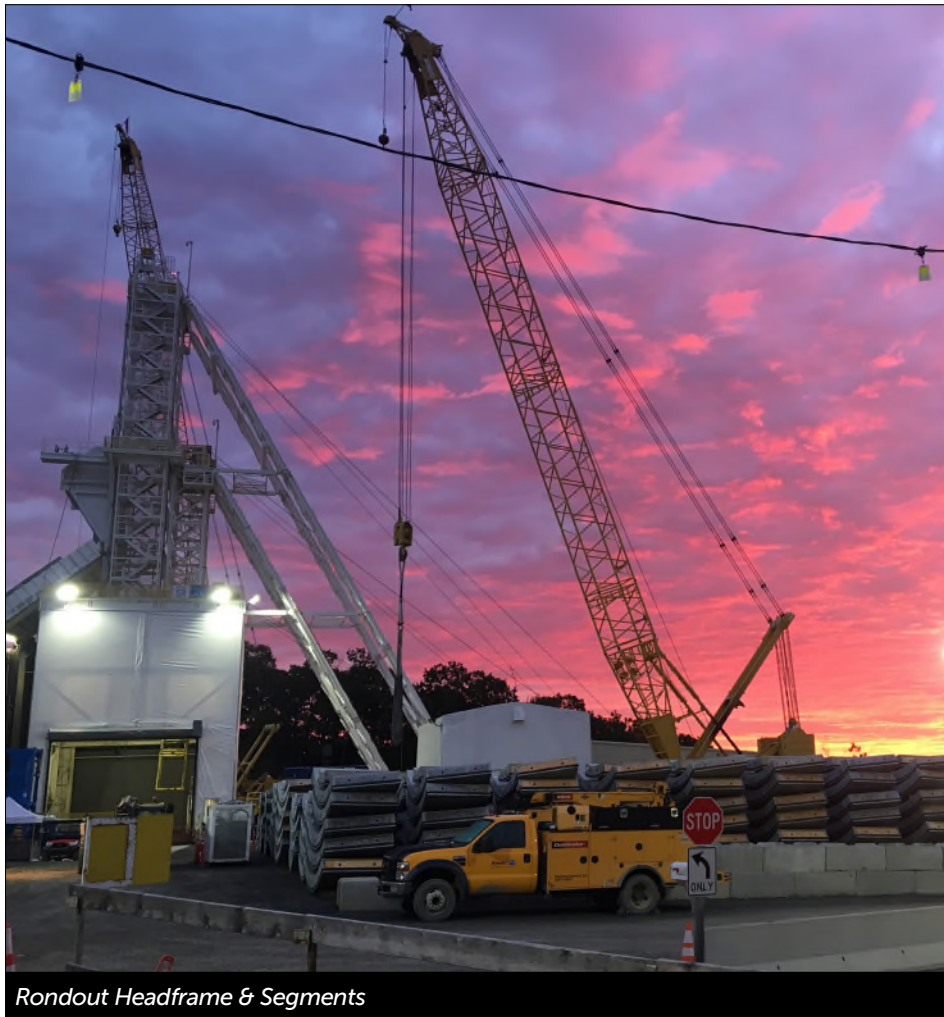
There are dozens of notable tunnels currently under construction in the United States. These include:

Highway Tunnels

- The Parallel Thimble Shoal Tunnel project in Virginia Beach, VA is well underway, with tunneling expected to commence later this year. This EPB TBM excavation will twin the existing immersed tube tunnel under the Chesapeake Bay constructed between 1960 – 1964.

Transit Tunnels

- Ahead of the 2028 Olympics, Los Angeles is the American hot bed for transit tunnels right now. Five major subway projects are currently underway; Crenshaw/LAX Corridor, Regional Connector, Purple Line Extension – Phase 1 and Purple Line Extension – Phase 2 and Purple Line Extension – Phase 3 (Tunnels). Phase 3 (Stations) of the Purple Line Extension has been awarded, with construction set to begin later this year. Combined, these projects will add 19 miles of new commuter lines and connect existing lines for shorter overall travel times.
- The Greater Seattle Area continues its "Sound Transit" expansion as the North Gate Link Extension project nears completion. TBM excavation is



Rondout Headframe & Segments



Alaskan Way

complete, with station construction well underway. East of Seattle, the Downtown Bellevue Tunnel (SEM) excavation is complete, with final lining and fit-out operations underway.

- A key component of the Maryland Purple Line Light Rail project is the Plymouth Tunnel. Excavation of this SEM tunnel is complete. Concrete final lining and fit-out operations are set to commence soon.

Water Supply

- TBM tunneling is underway beneath the Hudson River in upstate New York on the Rondout West Branch Bypass Tunnel. As the project name implies, this tunnel will bypass a deteriorating portion New York City's main water supply.
- The City of Atlanta is utilizing a novel approach to bolster its water reserves with its Raw Water Storage Program. A TBM driven tunnel, deep pump stations, adits and shafts will connect existing treatment and distribution facilities to an abandon quarry. When the project is completed, the quarry will be flooded to create an additional 2.4 billion gallons of on-hand storage.

Wastewater

Sewer and drainage tunnels continue to be the most prevalent tunnels being constructed in the United States.

- In Washington, D.C., tunneling for the Northeast Boundary Tunnel is now underway. The recent commissioning of the Anacostia River Tunnel places

2018 TUNNEL PROJECTS CURRENTLY UNDER CONSTRUCTION (PARTIAL)

Project	Location	Use
Parallel Thimble Shoal Tunnel	Virginia Beach, VA	Highway
Downtown Bellevue Tunnel (E330)	Bellevue, WA	Transit
Crenshaw/LAX Corridor Project	Los Angeles, CA	Transit
Purple Line Extension - Phase 1	Los Angeles, CA	Transit
Purple Line Extension - Phase 2	Los Angeles, CA	Transit
Regional Connector Transit Project	Los Angeles, CA	Transit
Northlink TBM Tunnels	Seattle, WA	Transit
Purple Line Light Rail Project (Plymouth Tunnel)	Silver Spring, MD	Transit
Ohio Canal Interceptor Tunnel	Akron, OH	Wastewater
Spring/Fishburne - Tunnels and Shafts	Charleston, SC	Wastewater
Des Plaines Inflow Tunnel	Chicago, IL	Wastewater
Westerly Storage Tunnel	Cleveland, OH	Wastewater
London Road Relief Sewer	Cleveland, OH	Wastewater
East 140th Consolidation and Relief Tunnel	Cleveland, OH	Wastewater
Blacklick Creek Sanitary Interceptor Tunnel	Columbus, OH	Wastewater
Three Rivers Protection and Overflow Reduction Tunnel	Ft. Wayne, IN	Wastewater
Mill Creek Drainage Relief Tunnel	Dallas, TX	Wastewater
Reedy River Basin Sewer Tunnel	Greenville, SC	Wastewater
South Hartford Conveyance and Storage Tunnel	Hartford, CT	Wastewater
White River Tunnel/Pogues Run Tunnel	Indianapolis, IN	Wastewater
Ohio River Tunnel	Louisville, KY	Wastewater
Black Snake Creek Stormwater Separation Project	St. Joseph, MO	Wastewater
Deer Creek Sanitary Tunnel	St. Louis, MO	Wastewater
Jefferson Barracks Tunnel	St. Louis, MO	Wastewater
Maline Creek CSO Storage Facility	St. Louis, MO	Wastewater
Bergen Point Outfall	Suffolk County, NY	Wastewater
Northeast Boundary Tunnel	Washington, D.C.	Wastewater
Water Supply Program/Raw Water Storage Facility	Atlanta, GA	Water
Rondout West Branch Bypass Tunnel	Newburgh, NY	Water

United States continued

both it and the Blue Plains Tunnel into service.

- Cleveland, OH has several wastewater tunnel projects ongoing, notably; the Doan Valley and East 140th Relief and Consolidation tunnels, and the Westerly Storage Tunnel.
- Los Angeles CA, Hartford CT, Akron OH, Ft. Wayne IN, Dallas TX and Louisville KY all have major wastewater and sewer tunnel programs underway.

FUTURE TUNNELLING ACTIVITIES

Several large tunneling projects are scheduled to tender soon in the United States.

- The Ship Canal Water Quality Project in Seattle will tender in 2019. This 18-foot diameter x 14,000-foot-long tunnel project will include the construction of five shafts.
- The Hampton Roads (Virginia) Bridge-Tunnel Expansion Project tendered in early 2019, with construction beginning later this year. This project will twin the existing highway tunnel near where the James River meets the Chesapeake Bay.
- Subject to available funding, the massive Bay Delta Water Conveyance Program may get started in 2019-2020, as several design and logistical contracts are scheduled for procurement. The entire project is

planned to consist of over 36 miles of twin 40-foot diameter tunnels. Recent state government decisions may reduce the scope of this project to a single bore.

- We may see elements of the Gateway Tunnels Project in procurement in 2019. These twin heavy rail tunnels will run under the Hudson River between New Jersey and New York to complement the existing and aging North River Tunnels. This project originally went into procurement in 2009 but was cancelled when the State of New Jersey withdrew funding. A follow-on project will rehabilitate the existing tunnels to effectively double current rail commuter rail capacity. The project continues to face major funding hurdles.
- The Santa Clarita (CA) Valley Transportation Authority's BART extension to San Jose will go to tender later in 2019. Even though all previous BART tunnels are twin-bore, the larger single-bore option has been approved for the new line.
- Wastewater tunnels will continue to make up the majority of tunneling projects in the United States throughout 2019 and 2020. St. Louis, MO, Cleveland, OH, Providence, RI and Alexandria, VA are just some of the U.S. cities that will continue to expand their facilities.



Plymouth Tunnel

STATISTICS

1. Length or volume excavated - % mechanized/% conventional during 2018

We don't track this statistic.

2. Amount (USD or EUR) of tunnelling/ underground space facilities awarded in 2018

The value of major tunnel projects awarded in 2018 was nearly US\$2,000,000,000.

3. List of tunnels completed

While many U.S. tunneling projects are nearing completion, the Alaskan Way Tunnel in Seattle is the major project to reach final completion in 2018. Boasting the World's largest EPB TBM (17.5m), the double-stacked highway tunnel was completed and is now open to traffic.

EDUCATION ON TUNNELLING IN THE COUNTRY

The Colorado School of Mines (CSM) continues to be the hub of tunneling education in the United States, where an annual four-day short course is conducted each Fall. Covered topics include contracting methods, geotechnical investigations, risk management, hard rock tunneling, soft and mixed face tunneling, ground improvement, safety and cost estimation. The "Tunneling Fundamentals, Practice and Innovations" course is taught by practicing experts and is open to both students and industry professionals.

Additionally, students at CSM can pursue post-graduate degrees in Underground Construction and Tunnel Engineering. Some of the particular course offerings are:

- Tunneling
- Underground Design and Construction
- Underground Construction Engineering in Hard Rock
- Underground Construction Engineering in Soft Ground
- Construction Engineering and Management
- Engineering Geology & Geotechnics
- Underground Construction Engineering Laboratory I & II
- Applied Numerical Modelling for Geomechanics

Other schools, such as the University of Michigan and the University of Illinois offer courses in tunneling. Through our "Teach the Professor" program, we expect further course offerings around the country soon.