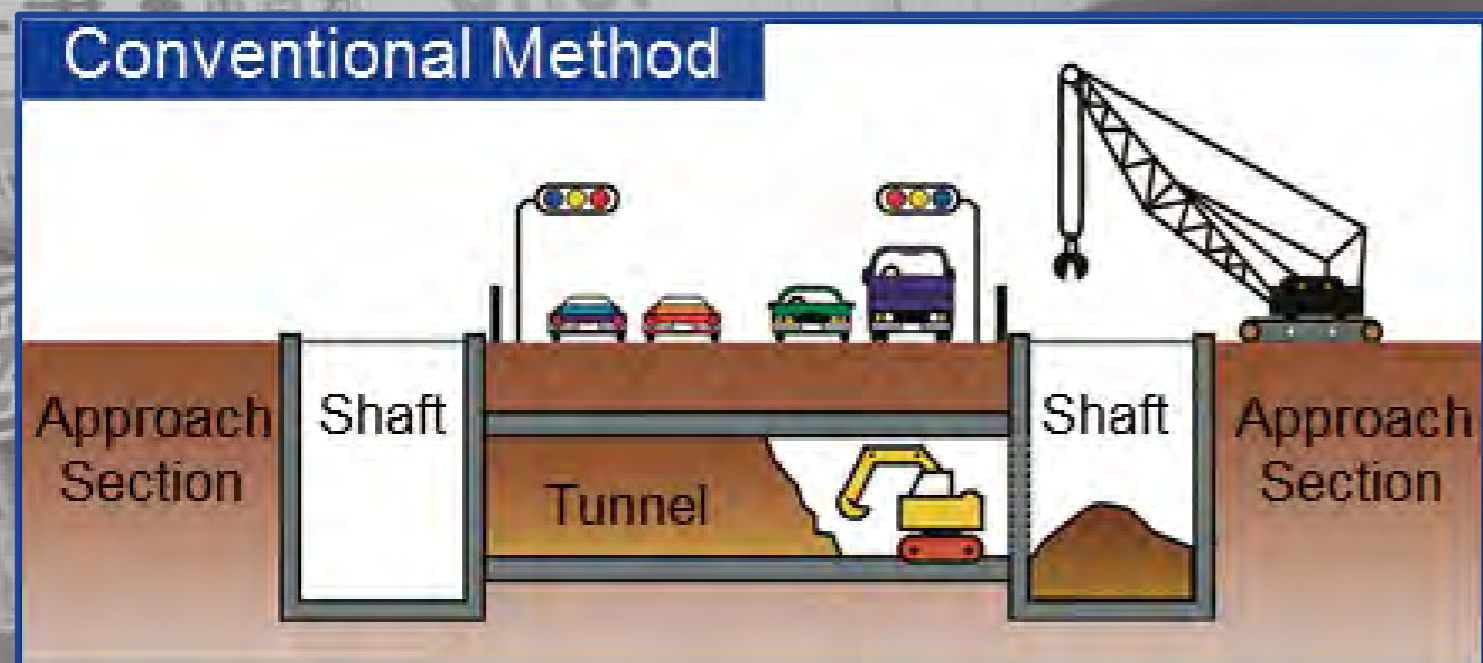


# URUP

## -TBM Launching and Retrieving at Ground Level-

~실드의 지상 발진 및 도달~

URUP (Ultra Rapid Under-Pass) is a proven tunneling management method developed by OBAYASHI to provide a tunnel under a congested intersection in an urban area with minimal disruption to the public. This innovative method enables TBM's to launch and be retrieved at the ground level.



### URUP Benefits

#### Shorten the Construction Duration

Continuous mining without shaft construction shortens the overall duration.

#### Minimize disruption to the Public

Reduces noise and traffic congestion by eliminating shafts and open-cut construction. Enables turnover of tunnel to the public in much less time compared to conventional methods.

#### Environment Friendly

Lower noise and vibration levels reduce environmental impact. URUP's shortened project duration reduces CO2 emissions from construction equipment. TBM mining also results in far less soil disposal than conventional cut & cover construction method.

#### Cost Reduction

Reduces construction costs by shortening project duration and eliminating shafts and open-cuts.

### Multiple Applications

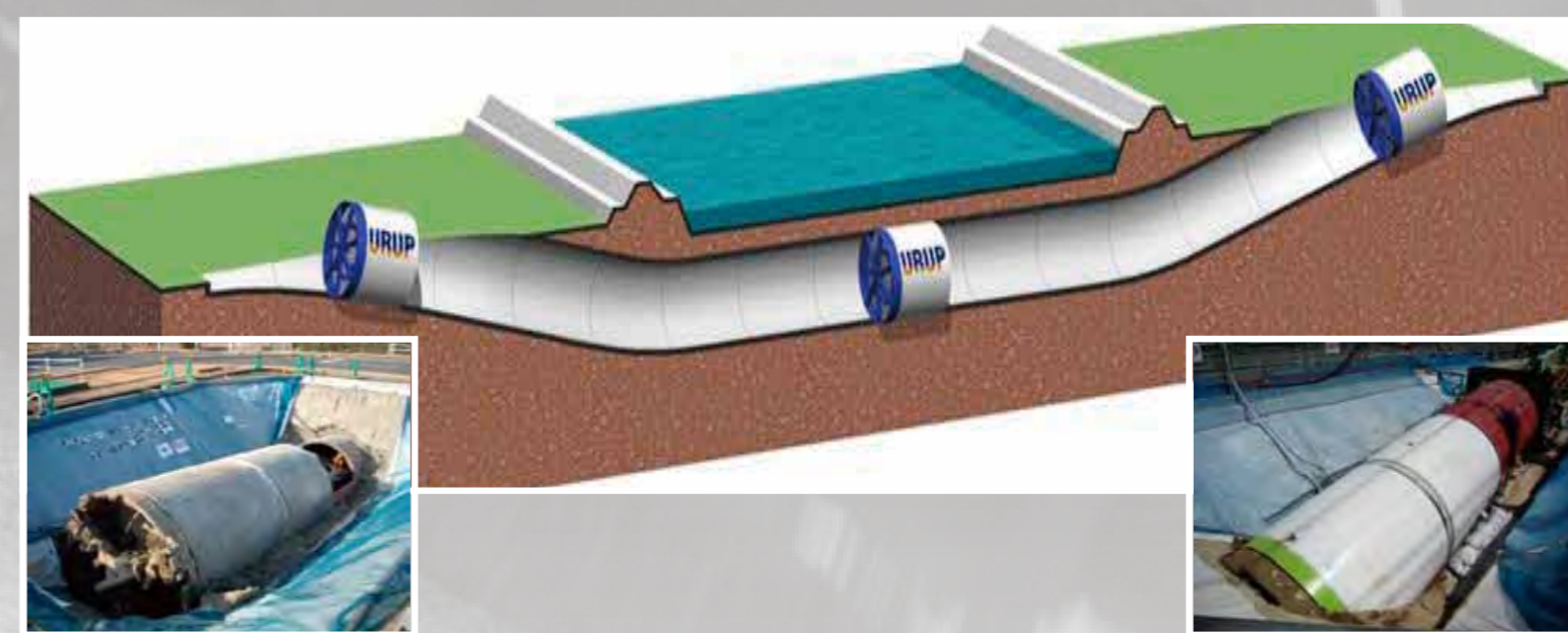
#### Access Tunnel

Between the surface and underground structures (i.e. branch sections of expressways or subway lines).



#### Underwater Crossing (Sea/River)

Life-line-tunnels under the water for railway, road, electric power, gas pipes.



A Gas Main Installation Under Bay

### URUP Experience

#### Circular Tunnel for Highway Ramp (Tokyo, Japan)



#### Combined Arch Highway Tunnel with Super Shallow Cover (Tokyo, Japan)



Any questions about OBAYASHI's State of the Art TBM technologies, please contact,

