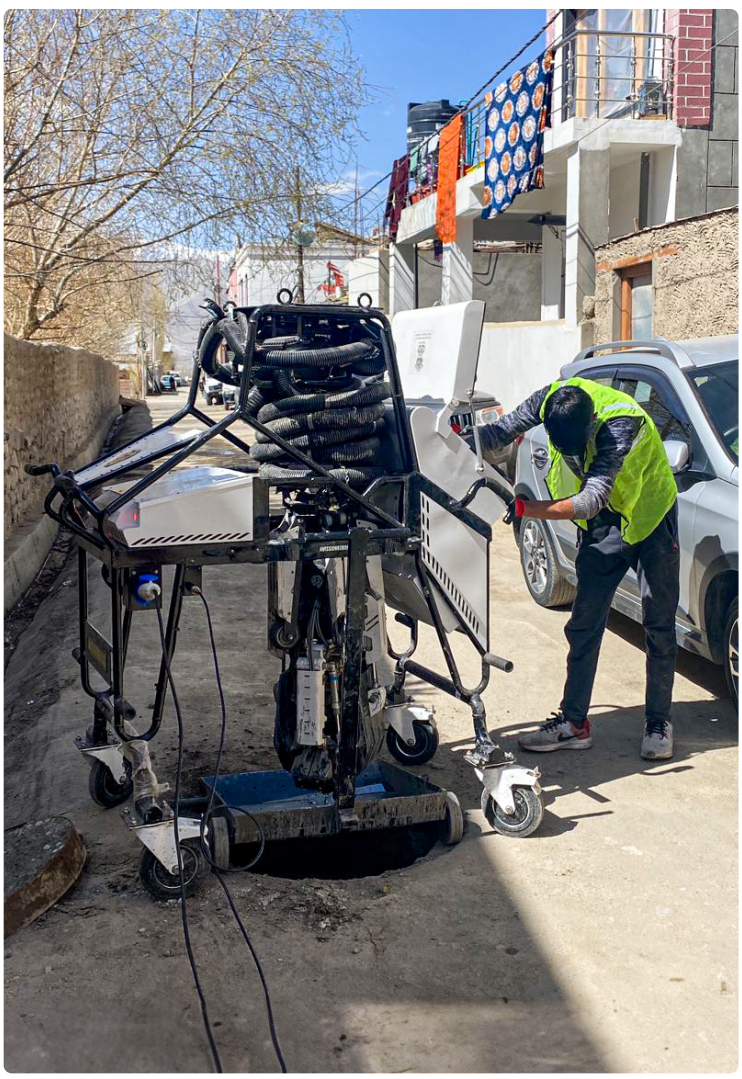
GENROBOTICS®

CASE STUDY :

BANDICOOT ROBOT
IN LEH, LADAKH

Robotic Manhole Cleaning in High-Altitude, Extreme-Climate Conditions



CLIENT :
Leh Municipal Administration /
Public Health Engineering Department

SECTOR:
Urban Sanitation /
Public Infrastructure

LOCATION :
Leh, Ladakh, India

ROBOTIC SOLUTION DEPLOYED:
Bandicoot Robot*

*Designed for safe, non-manual manhole and sewer cleaning.

PROJECT BACKGROUND

Leh, one of the highest and coldest urban settlements in India, faces unique sanitation challenges: manholes freeze, manual cleaning is unsafe due to extreme altitude, and sludge buildup can paralyze sewer networks.

The administration deployed Bandicoot, the world's first robotic scavenger, to eliminate manual entry and ensure hygienic, year-round manhole maintenance.

DEPLOYMENT HIGHLIGHTS

- Altitude: >11,000 ft above sea level.
- Temperature Range: Operated in sub-zero to temperate conditions.
- Application: Cleaning of municipal manholes and sewer junctions.
- Cleaning Volume (Initial Phase): Over 100 manholes cleared.
- Integration: Coordinated with Leh's jetting units and vacuum tankers.

CHALLENGES ADDRESSED

- Frozen and blocked manholes during winter months.
- High altitude & low oxygen environments unsafe for human cleaning.
- Manual scavenging ban enforcement in remote terrain.
- Logistical constraints in transporting and operating heavy equipment.

TECHNOLOGY IMPACT

- Remote-Operated Cleaning: No human descent into manholes.
- Telescopic Arms & Jetting: Effective in removing hardened, frozen waste.
- Compact Design: Navigated narrow lanes and confined spaces in old town areas.
- Reliable operation in off-grid conditions using generator or electrical supply.

OUTCOMES & BENEFITS

- First robotic manhole cleaning deployment in Himalayan region.
- Completely eliminated manual entry in all covered zones.
- Enabled cleaning during winter, avoiding seasonal health crises.
- Boosted worker dignity by transitioning former manual scavengers to robotic operators.