LARSEN & TOUBRO

turnkey solutions for
rail and urban transit infrastructure

Western Dedicated Freight Corridor, India

Eighty years of
UNDISPUTED LEADERSHIP

Larsen & Toubro is an Indian multinational engaged in EPC Projects, Hi-Tech Manufacturing and Services. It operates in over 50 countries worldwide. A strong, customer–focused approach and the constant quest for top-class quality have enabled L&T to attain and sustain leadership in its major lines of business for eight decades.

EPC Projects

- Construction
- HydroCarbon
- Power Plant Equipment

Hi Tech Manufacturing

- Heavy Engineering
- Machinery & Industrial Products
- Construction & Mining Machinery
- Defence
- Valves

Services

- Information Technology
- Technology Services
- Smart World & Communication
- Realty
- Financial Services

The Indian
CONSTRUCTION GIANT

L&T Construction, India's largest construction organization and ranked among the world's top contractors, has been transforming cityscapes and landscapes with structures of immense size and grandeur for several decades. The organization's capabilities span the entire gamut of construction – civil, mechanical, electrical, and instrumentation engineering – and its services extend to all core sector industries and infrastructure projects.

Several of the country's prized landmarks – edifices, structures, airports, industrial projects, flyovers, viaducts, water and power infrastructure projects – carry L&T's signature of excellence in construction. Today, more and more structures beyond India's boundaries are standing tall, thanks to L&T Construction.

L&T Construction straddles eight related businesses:

- Buildings & Factories
- Heavy Civil Infrastructure
- Transportation Infrastructure
- Power Transmission & Distribution
- Renewables
- Water & Effluent Treatment
- Minerals & Metals
- L&T GeoStructure

Building landmarks, setting benchmarks*

- **12** International Airports (total capacity: **250 MPPA**)
- **336,000+** IT Seats
- **94,000+** Dwelling Units
- **100+** Manufacturing Facilities
- **30,000+** Hospital Beds
- **500,000+ km** of Water & Wastewater Networks
- **12,800 MLD** of Water & Wastewater Treatment Plants
- **12L+ Hectares** of Land Being Irrigated
- **970** EHV Substations
- **50,659 ckm** of Transmission Lines
- **100,000+** Habitations Electrified
- India's Largest City Surveillance **6,000 cameras** at **1,500 locations** at Mumbai
- **35+ GWp** Portfolio of Solar Plants
- **436 km** of Metro Rail Corridors
- **468 km** of High-Speed Rail
- **1400 Tkm** of Metro BLT Tracks, **560 Tkm** of OHE
- **273 km** of HSR Tracks and **508 km** HSR OHE
- **6,191 Tkm** of Railway Track Laying
- **21,665 Tkm** of Railway Electrification
- **16 GWh** of Battery Energy Storage
- **444 MW** of Floating Solar Plants
- **1.65 GW** of Wind BoP
- **25,889 Lane km** of Roads, Interchanges, & City Infra
- **115L Sq. m.** of Runways
- **24** Nuclear Power Projects
- **540L tonnes** of Hot Metal (Iron) Making
- **24** Blast Furnaces

*The track record information published here is as of August 2025

CTP-3R - Iqbalgarh to Vadodara 342 rkm (726 tkm) Commercial Operations started in Priority section - New Phulera Yard

TRANSFORMING RAIL AND URBAN TRANSIT INFRASTRUCTURE

Across geographies

Railways are the lifeline of nation's economy and urban transit is key to sustainable urbanisation. L&T offers Turnkey Design-Build/EPC solutions with single point responsibility encompassing design, engineering, supply, project planning, quality control and execution.

Our range of services include :

- Integrated / Composite Railway Projects
- Dedicated Freight Corridors
- Conventional and Ballastless Trackworks
- Railway Electrification
- Signalling and Telecommunication Systems
- Urban Rail Mass Transit System (Metro/Monorail)
- High Speed and Semi-High Speed Rail
- Bridges, Tunnels, Underground and Elevated Stations

E&M Systems including Overall System Integration - Dhaka Metro

Middle East & Africa

Mauritius Light Rail System (29.5km)
An Integrated Transit System with 23 stations, Viaducts, Track works, DC traction, Integration with Road Traffic and Procurement of Light Rail Vehicles.

Riyadh Metro Line 3 (41 km)
Complete Metro System (11 km tunnel, 22 stations, 26 km viaduct, 2 depots)

Riyadh Metro Line 1 & 2 (113 tkm)
Ballastless Trackworks (6tkm NATM section, 46 tkm Viaduct, 36 tkm At grade, 25 tkm Depot)

Doha Metro, Gold Line (11.6 km)
22 km of tunnels and 10 stations

Neighbouring Geographies

Dhaka Metro Line 6 (20km | 16 stations)
Integrated Systems Works - Trackworks, Electrification Works, CBTC Signalling and System Integration

South East Asia

Jakarta MRT Phase 2A (12.5tkm | 7 UG Station)
Integrated Systems Works - Trackworks, Electrification Works, CBTC Signalling and System Integration

India

Metro Civil Works
243 km of Elevated Metro Corridor & Semi High Speed Rail | 170 km of UG Metro Corridor | 272 Metro station

Metro Systems Works
180 TKM ROCS |DC Traction - 50TKM (Monorail), 60 TKM (Agra Metro) | 1400 TKM - Ballast less Track work | 390 TKM - Flexible OHE in Delhi, Mumbai, Ahmedabad, Hyderabad, Chennai, MEGA, Kanpur, Agra.

Systems Works for High Speed & Regional Trains
MAHSR Shinkansen Slab tracks 273 km |
MAHSR Electrification Works for (501 RKM/1010 TKM) |
Slab Track for RRTS (81 RKM/209 TKM)

Integrated Transit System - Mumbai Monorail 20 km

Dedicated Freight Corridor
Civil & Trackwork (2450 tkm in WDFC and 225 tkm in EDFC), 2x25 kV Electrification (3340 tkm in WDFC and 1150 tkm in EDFC), S & T (1200 tkm in WDFC and 970 TKM in EDFC)

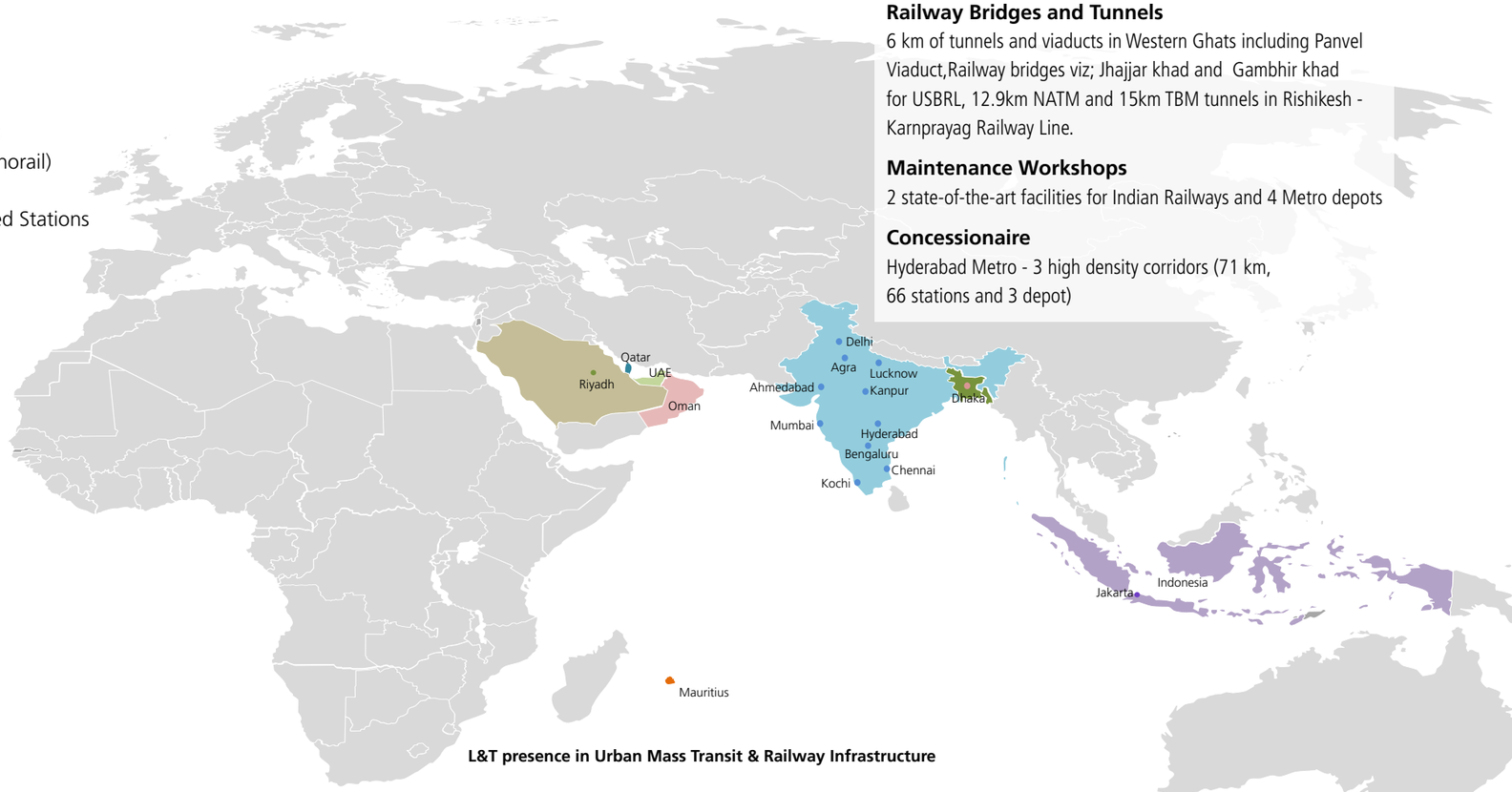
Rail connectivity
Dhamra Port, Nabha Power, Maithon Power, Sterlite Energy, Odisha Power, Lafarge Cements, Tata Steel, BALCO

Mainline
2080 TKM - Civil & Track | 15900 TKM - OHE and associated PSI | S&T for 350+ stations

Railway Bridges and Tunnels
6 km of tunnels and viaducts in Western Ghats including Panvel Viaduct,Railway bridges viz; Jhajjar khad and Gambhir khad for USBRL, 12.9km NATM and 15km TBM tunnels in Rishikesh - Karnprayag Railway Line.

Maintenance Workshops
2 state-of-the-art facilities for Indian Railways and 4 Metro depots

Concessionaire
Hyderabad Metro - 3 high density corridors (71 km, 66 stations and 3 depot)



L&T presence in Urban Mass Transit & Railway Infrastructure

FULL RANGE SYSTEM INTEGRATOR

Civil & Trackworks | Traction | Signalling & Telecom

For the Dedicated Freight Corridor, L&T has executed Mega Projects on Design Build basis - moving towards one of the largest System Integrators Worldwide.

Western DFC (JICA Funded)

- Civil & Trackwork for a continuous section of 2113 tkm, involving 228 major bridges and 1460 minor bridges.
- Electrical & Mechanical Works for the entire section of WDFC (3145 tkm) employing state-of-the-art automated techniques
- Signalling & Telecom for 897 tkm involving State-of-the-art command center, Electronic Interlocking and GSM-R based communication.
- Integrated Composite Project involving Civil, Track, Traction and S&T for 316 tkm

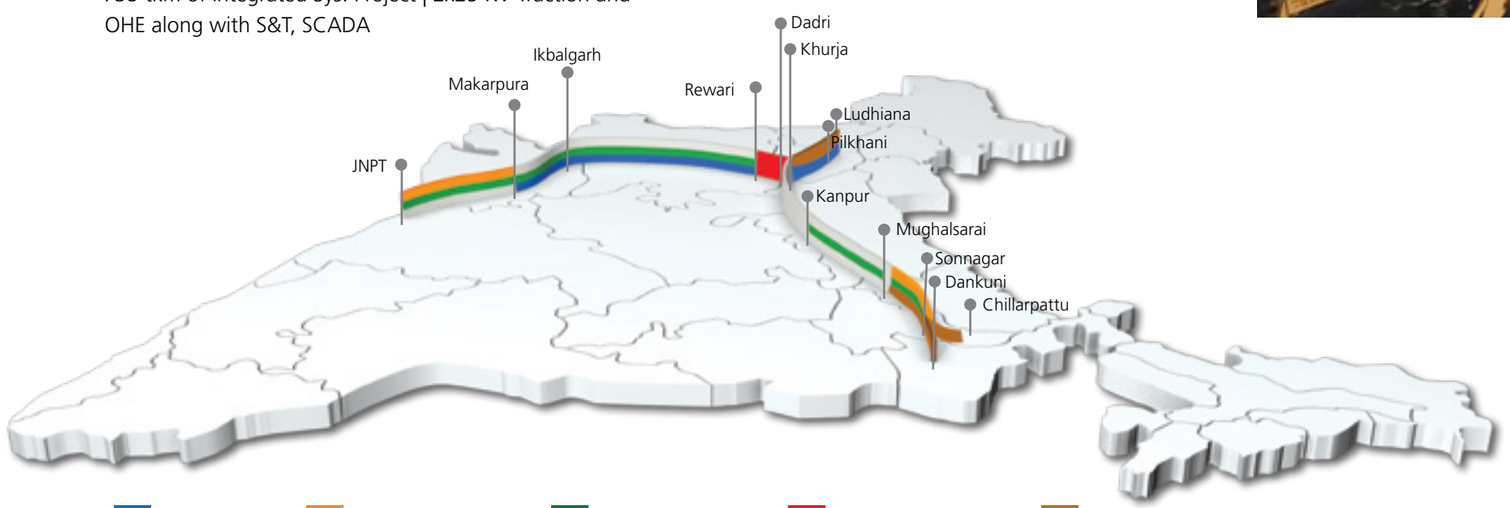
Eastern DFC (World Bank Funded Projects)

- Civil & Trackwork for 222 tkm involving 37 major bridges and 395 minor bridges.
- 2x25 KV Electrification of 1024 tkm
- 735 tkm of Integrated Sys. Project | 2x25 KV Traction and OHE along with S&T, SCADA

Heavy Haul Double Stack Container Rakes Powered by 12000 HP Electric Locos - WDFC CTP 1 & 2 sections in Regular Commercial Operation

CP303 (Civil & Track) and CP 305 (Electrification and Signalling) - Khurja to Pilkhani 225 rkm

NTC at WDFC (CTP 14) - Mechanised Methods for Track linking results in High Quality and Speedy Execution



Civil & Track | Signalling & Telecom | Railway Electrification (OHE) | Integrated Composite Project | Integrated Systems Project

Palanpur Yard at CTP 3R Project - WDFC

RAILWAY ELECTRIFICATION

High Speed Execution through Wiring Train and Mechanisation

Electrification in Katra - Dharam sections in Jammu – Baramulla Railway including 19 tunnels, 84 Girder bridges and the iconic Chenab and Anjikhad bridges

Electrification of Dedicated Freight Corridor (DFC) in India. For Western DFC, L&T has executed Railway Electrical Mechanical Works for the entire section of the corridor (3145 tkm) employing state-of-the-art automated techniques. In the Eastern DFC, L&T has executed over 1024 tkm of 2x25 kV Traction and OHE along with S&T, SCADA and 132 kV Transmission.

Large EPC Electrification Projects for Indian Railways. This includes • Electrification of Roha - Verna section of Konkan Railway in India's Western Ghats (582 tkm) • Delhi Rohilla - Rewari, Alwar - Madar (780 tkm) sections • Electrification in Various section of North-Western Railway (1186 TKM), Southern Railways (1155 TKM) and Northeast Frontier Railway (1135 TKM)

India's First Mainline Electrification Project Using the Rigid Overhead Conductor System (ROCS) Delivered railway electrification in India's strategic Jammu - Baramulla line through electrification of the Katra - Dharam sections for Northern Railway. The project encompasses 25KV electrification of 80 TKM including ROCS (Furrer + Frey, Switzerland) for significant stretches, associated power supply systems & SCADA.

WDFC EMP 4 section - In Regular Commercial Operation

Scott Transformer in WDFC

Gas Insulated Switchgear at Kharbao, WDFC

Electrification in Katra-Dharam section using Rigid OCS at major sections

Electrified section of Roha (Mah) - Verna (Goa) of Konkan Railway completed in record time | Majorly single line passing through 70 tunnels and 125 bridges.

GSM-R Based Communication in WDFC - CTP14

SIGNALLING AND TELECOMMUNICATION

Centralised Train Monitoring System | Moving Towards ETCS Level 2

L&T's experience and expertise spreads to the handling of major turnkey projects for railway signalling and telecommunication services. Strategic alliances have been forged with leading signalling manufacturers to provide state-of-the-art system engineering for automatic train control systems for train supervision, protection and operation including electronic interlocking.

Delivered Integrated Signalling for 897 tkm in WDFC and over 500 tkm of EDFC involving :

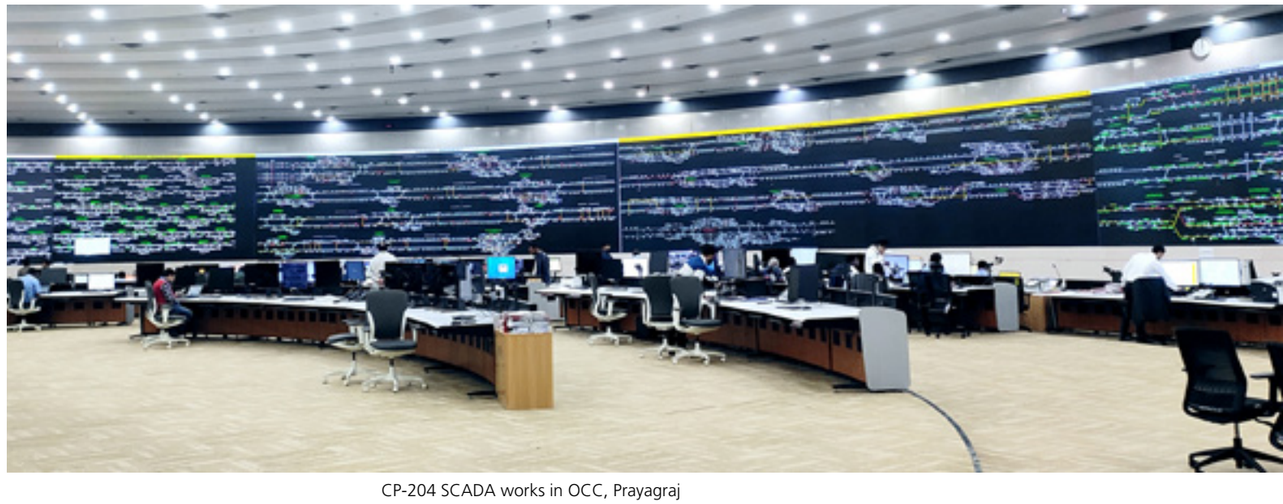
- State-of-the-art command center
- Automatic block working with Multi section Digital Axle Counter
- Electronic Interlocking
- Data Networking System
- Radio Systems (GSM-R / TETRA / VHF)

Operational Control Centre (OCC) for Western Dedicated Freight Corridor, Ahmedabad

Electronic Interlocking panels

CT Racks

GSM-R tower at CTP14 - WDFC



CP-204 SCADA works in OCC, Prayagraj

Mauritius Metro

Depot at Richelieu

INTEGRATED LRT SYSTEM - MAURITIUS METRO EXPRESS

29.5km, 23 Stations, Viaducts & Bridges, DC Traction, Track works, Rolling Stock, Ticketing & Information, Depots & Yards

Operations Control Centre

Alignment through dense urban centres

Mauritius Metro Express is a Light Rail Transit System that connects the suburbs at Curepipe, Quatre Borne, Rose hill, to the business district in Port Louis. The 29.5km route includes 19 stations (2 elevated) and connects major bus interchanges to enable a multimodal Urban Transit solution.

The 'Track to Train' project includes 100% low floor Light Rail Vehicles (LRVs), Construction of Viaducts & bridges, Installation of Track works, DC electric traction power supply systems, Ticket Vending and Validating Systems, Passenger Information System and Integration with Road Traffic through advanced Signaling systems.

A state-of-the-art Depot at Richelieu enables Stabling provision for over 32 LRVs and also Light and Heavy Maintenance Workshop facilities. The facility also houses the Administrative Building, Training and Simulation facility and Operations Control Centre.

Besides connecting the arterial route from Curepipe to Port Louis, the route also connects the eastern suburbs thru Cybercity, University Campus and Reduit

Elevated Station at Rose Hill, Mauritius

Quatre Borne Interchange Station

E&M Systems including Overall System Integration

Trackworks and Overhead Catenary System at Uttara Depot

INTEGRATED SYSTEMS WORKS - DHAKA METRO

Trackworks, Electrification Works, CBTC Signaling and System Integration

132 kV GIS - based RSS

MRT Line-6 is an elevated Metro Rail system that connects 'Uttara' to 'Motijheel' (20 km, 16 stations). The D&B scope involves Multiple Systems across various domains, Overall System Integration and Maintenance support

Trackworks

Ballastless Track Work in Operational sections (43 Tkm) | Depot Track (19 Tkm)

Electrification Works

- 132 KV GIS based RSS and EHV cabling
- 1500V DC Traction Sub Stations (TSS)
- DC Overhead Catenary System (OCS)
- 33 kV Cable ring, ASS & SCADA
- Energy Storage System (ESS) & SCADA works

Signaling, Train Control & Telecom

- Communication Based Train Control (CBTC) Signalling
- Integrated Platform Screen Doors
- Telecom system and Radio Comm. based on LTE

Auxiliary Systems

- Automatic Fare Collection System
- Lifts and Escalators

The entire section of Dhaka Metro Line 6 has been successfully commissioned and in commercial operations.

Automatic Fare Collection System

Platform Screen Doors

Communication Based Train Control and Signalling

State of the Art - Operations Control Centre

Depot facilities in Riyadh Metro Line 3

RIYADH METRO

Line 3 - Design Build of Complete Metro System

L&T is part of the ArRiyadh New Mobility Consortium and along with Ansaldo STS, Salini- mpregilo, Nesma & Partners and Bombardier Transportation is executing a 41 km stretch - Line 3 of the Riyadh Metro. The design and build contract includes implementation of the complete metro system including construction of bridges, tunnels, elevated and underground stations and depots.

Line 1 & 2 - Design Build of Direct Fixation Resilient Track System

L&T has executed the Ballastless Trackworks for Line 1 & 2 on Design & Build Basis. The Project involved 113 tkm of ballastless tracks including through 6 tkm of Resilient Track in NATM section, 46 tkm on Viaduct, 36 tkm in At grade sections and 25 tkm of 'Twin Block' based Slab track spread across 3 depots.

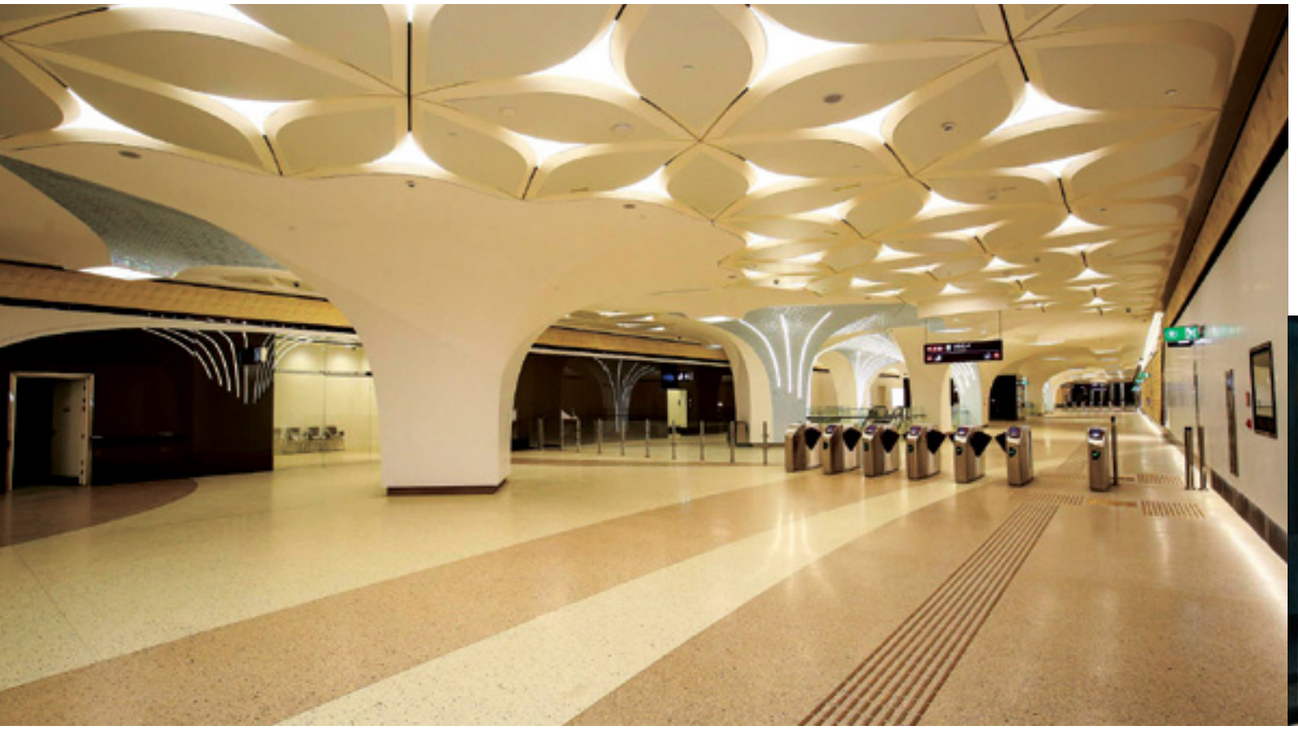
Station interiors designed for commuter delight - Line 3

Slab Tracks in Elevated sections of Line 2

DOHA METRO

Design Build of Gold Line Civil Works

L&T, along with Aktor, Yapi Merkezi, STFA and Al Jaber Engg. constructed over 22km of tunnels and 10 underground stations along with architectural finishes and MEP works.



Stations At Doha Metro Gold Line

INTEGRATED SYSTEMS WORKS – JAKARTA MRT

Bundaran HI to Kota 12.5 tkm, 7 UG stations

The project involves procurement and delivery of multiple systems across various domains on a design and build (D&B) basis including overall System Integration.

The scope includes Trackworks, Overhead Contact System, Substation System, Power Distribution System, Communication Based Train Control System (CBTC), Telecommunication System., SCADA Facility, Platform Screen Doors, and modification of the equipment installed in the existing OCC and the stations/train sets (Phase-1).

Trackworks

- Ballastless Trackwork in UG section (12.5 Tkm)

Power Supply, Distribution & Overhead Contact System

- Traction Sub-station (TSS) including 1500V DC Switchgear, Rectifier Unit, Rectifier Transformer etc.
- Receiving Sub-station (RSS) including 150kV Feeder
- 1500 V DC Rigid Overhead Catenary System (ROCS)

Signaling & Telecommunication System

- Communication Based Train Control (CBTC) Signalling
- Extension of Phase-1 Signalling across new stations & newly procured train sets
- Telecom system based on TETRA.

Auxiliary Systems

- Full Height Platform Screen Doors (PSD)
- Facility SCADA

MUMBAI METRO LINE 3

Mumbai's biggest and most challenging infrastructure

The 33.5 km UG alignment (26 stations) is a trunk line connecting Cuffe Parade in South Mumbai, Mumbai CST, Mumbai Central, Business Districts at Bandra Kurla Complex, Domestic and International Airports and the Free Trade Zone at SEEPZ.

L&T has delivered two major tunnel packages viz; UGC-01 in South Mumbai and UGC-07 that passes under the 2nd busiest airport in the country. The Scope includes construction of Twin Tube Tunnels, stations at Cuffe Parade, Vidhan Bhavan, Churchgate, Hutatma Chowk, Marol Naka, MIDC, SEEPZ including MEP & Architectural Works.

Station at Cuffe Parade - creating infrastructure amidst dense constructed space

LVT Tracks in Mumbai Metro Line 3

Power Supply Systems

L&T has executed the Power Supply System for the entire line including Receiving Sub-stations, 110 kV Cabling works, Traction Sub-stations, Switching Stations, Auxiliary Main Sub-stations, Switching Stations, SCADA System & Integration with other Systems

Low Vibration Track (LVT) System

Line 3 passes beneath various heritage and old residential structures amidst varied geology. Hence it necessitates high level of noise and vibration attenuation.

L&T has adopted for the first in India, Specialised Low Vibration Tracks (LVT) Sleeper Blocks from Sonneville, Switzerland.

Through a dedicated block LVT casting factory with production capacity of over 600 blocks/day, over 200,000 LVT blocks have been produced in record time.

Ballastless Track Installation includes the entire stretch of over 33.5 km (67.8 tKm) of Line 3 and Ballasted Track at Depot

LVT Sleeper Block Production

INTEGRATED SYSTEMS WORKS MUMBAI METRO LINE 4

35km, 32 Stations

Mumbai Metro's Line 4 is a 35.3 km elevated corridor between Wadala in Central Mumbai and Kasarvadavali in Thane with 32 stations. It will be one of the longest metro lines in the city, and provide connectivity to the existing Eastern Express Highway, Monorail and other lines of Mumbai Metro.

L&T is executing an Integrated Systems Package that includes Metro Trainsets, CBTC signalling and train control, Telecommunication, Platform screen doors, and Depot machinery & plant with 5 years of maintenance.

L&T has partnered with Alstom for the Metro Trainsets and the Signalling system with five years of maintenance.

Mumbai Metro Line 4

INTEGRATED TRANSIT SYSTEM

Mumbai MonoRail - 20km, 17 stations

Mumbai Monorail, India's first urban transit project on design-build basis was executed by a L&T-led consortium. The 20 km line (Jacob Circle-Wadala-Chembur) features 17 stations, a maintenance depot.

- Passenger friendly stations, AFC and PIS
- Casting and erection of high-accuracy guideway beams
- One of India's first 750 V DC traction-based urban transit systems
- System interface management with rolling stock, signalling, telecom, civil and electrical works
- Automated signalling system with centralized control

Integrated maintenance depot

High level of skillset in interfacing of civil and systems works

Operation and command centre

Nagole station

Maintenance Bays in Uppal Depot

HYDERABAD METRO

World's biggest mass transit project on concessionaire basis

L&T, through its Special Purpose Vehicle, L&T Metro Rail (Hyderabad) Limited, has developed the entire metro network for the city of Hyderabad with a concessionaire period of 35 years which is considered as one of the world's most prestigious and biggest contracts on a BOT basis in the Metro sector. Major part of the sections are in commercial operation now.

The scope comprises building the entire Metro alignment for three high density corridors spread over a distance of 72 km along with 66 ultra-modern station buildings, 3 state-of-the-art depots, overhead electric traction systems and ballastless track works. This world-class transit system is being operated by Keolis - France using Rolling Stock from Hyundai-Rotem, Signalling & Train Control along with Communications Systems from Thales and Automatic Fare Collection from Samsung.

Hyderabad Metro - World's biggest mass transit project on concessionaire basis

HIGH SPEED RAIL

Mumbai - Ahmedabad High Speed Rail (MAHSR) 508 km

In India's first High Speed Rail Project, L&T is executing mega packages, hitherto unseen in Infrastructure domain. This includes major Viaduct C4 Pkg (237 km), C6 pkg (87.5 km) and Station cum Viaduct C5 pkg (8km) overall contributing to 63% of the Viaduct Construction.

Viaduct construction in MAHSR - Full Span Girders weighing around 980 MT being launched using Launching Gantry

The project uses full span launching equipment like high-capacity straddle carriers, girder transporters and launching girders. The straddle carrier developed by L&T's manufacturing facility at Kanchipuram, India has the capacity to lift girders weighing up to 1100 MT. The equipment has been entirely designed inhouse, with 85% locally sourced components for the first time in India.

Shinkansen OHE System

L&T is executing Electrification for the entire stretch of 508 Route Km of MAHSR Project. The scope includes Design, Manufacture, Supply, Construction, Installation, Testing and Commissioning of 2x25 kV Power Supply Electrification System (Traction Substation, Overhead Equipment and MV/LV Power Distribution Equipment), along with associated Buildings and equipment in training institute on Design Build Lump Sum Price Basis

It is a first of its kind railway electrification project in India involving the implementation of Japanese Shinkansen High Speed Technology with sophisticated equipment including Heavy Compound Catenary OHE System.

Shinkansen J-Slab Track System

L&T is also executing the Ballastless Slab track works including manufacturing, supply, and installation for a stretch of 116 rkm from Vadodara city to Sabarmati Depot.

A High-speed Rail moving at 350 kmph, involves high accuracy Slab tracks whose accuracy is closely linked to the quality of the supporting structure which in turn enhances the ride quality. Through Technology transfer from JR East, L&T has adopted the proven Shinkansen J-Slab Track System to enable operational speeds of 320kmph better ride quality, increased service life and maintainability.

Slab Casting through Automated Concrete Spreader.

Rail Feeder car

Pre-Cast Slabs in TSMF and Mechanised Track Construction on Viaduct

REGIONAL RAPID TRANSIT SYSTEM (RRTS)

India's first Semi High Speed Regional Connectivity

Delhi-Ghaziabad-Meerut corridor (81 km) is part of RRTS Phase 1 connecting New Delhi to nearby Tier 2 cities – funded by ADB and AIIB.

Installed Slab Tracks on Viaduct

Viaduct and Stations

The RRTS system is designed for speeds of upto 180 kmph and L&T has constructed over 50% of the elevated structures, including associated stations through Pkg. 3 (33 km viaduct, 7 stn.) and Pkg. 7 (12km viaduct, 5 stn.)

Pre-Cast Slab Track System

L&T also delivered the Ballastless Slab track works including manufacturing, supply, and installation for the entire stretch of 81 rkm/209 tkm (137 tkm on Viaduct, 23 tkm in UG and 49 tkm of Depot Tracks)

Through Technology transfer from PORR (Austria), L&T has adopted a Pre-Cast Slab Track System to enable higher speed, increased service life and maintainability.

The Pre-Cast Slabs, each measuring over 5 m x 2.5m and weighing over 4 tons are produced in a factory controlled setup.

The project incorporates high level of Digital Technologies for sub-system management, Slab Traceability and Supply Chain Management.

State-of-the-Art factory designed to produce over 47000 slabs of 30 types

Stringent Quality Control to maintain geometric parameters

DELHI METRO

Civil & Systems Works in Phase 1, 2, 3 and 4

Tunnel / Viaduct / Stations

- 6.6 km UG corridor from Kashmere Gate to Central Secretariat along with stations at Rajiv Chowk, Chawri Bazar, Malviya Nagar
- 554 m long Metro rail bridge across River Yamuna

Traction / E&M

Design, supply, installation, testing and commissioning of :

- 25 kV Over Head Electrification (OHE) for major portion of Phase 3
- Rigid Overhead Contact System - ROCS (for entire tunnel section of Phase 2 and major portion of Phase 3)
- Underground electrification, fire suppression and utilities

Phase 3

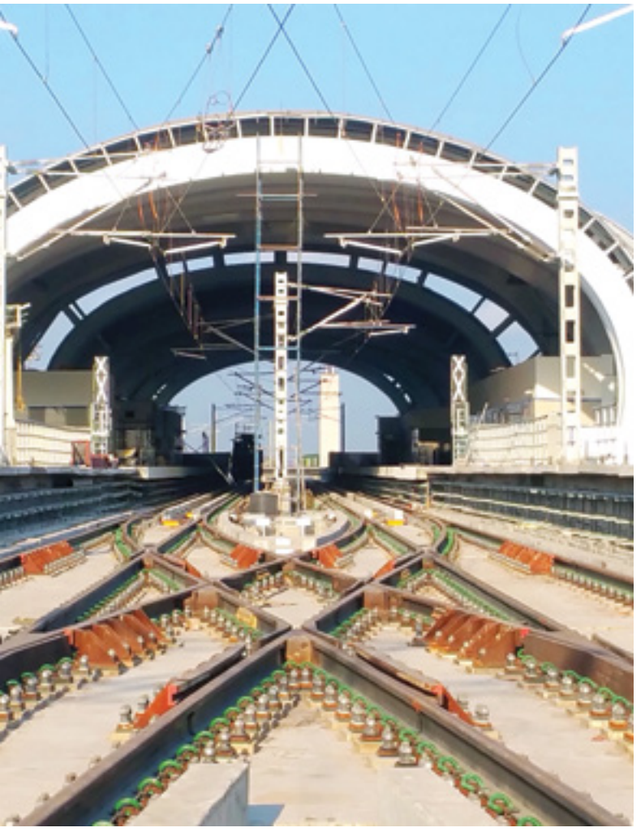
L&T executed 25km viaducts, 10km tunnels and 20 elevated stations and 6 underground stations. On the systems aspect, we executed 150 tkm of OHE, 50 tkm of ROCS and 50tkm of Ballastless Trackworks

Delhi Metro Phase 3 Delhi - Haryana border - 14.2 km full span U girders.

OHE Works at Kalindikunj Depot - Delhi Metro Phase 3

OHE using aluminium single cantilevers in Line 8 - Phase 3 DMRC

View of the elevated section through one of the many complex alignments



Completed section of Slab Track in a Turnout section of Chennai Metro.

CHENNAI METRO

For Phase 1, L&T has constructed 9.5 km of viaduct section, 3.35 km UG TBM section, 6 elevated stations, 3 UG stations, Depot, and 110 km of ballastless trackwork for the entire operational section and depots.

For Phase 2, L&T is executing over 40km of Viaducts and 12 km of UG sections.

L&T is also executing multiple Systems Works packages in Corridors 3 & 5. This includes Ballastless Track works Packages of ATW-11 (CMBT- Sholinganallur – SIPCOT- 73TKM), ATW-09 (Madhavaram Milk Colony – Sholinganallur- 73 TKM) and one of lengthiest standalone Metro OHE packages in Corridor 3 (From Madhavaram Milk Colony to Sholinganallur- 71 TKM) and Corridor 5 (From Madhavaram Milk Colony to CMBT, including Depot at Madhavaram- 33 TKM and Depot- 21 TKM).

LUCKNOW METRO

At Lucknow, L&T has constructed 19.43km of viaduct, 19 elevated stations along with Power supply system(2 RSS, 4 TSS), 25kV Flexible & Rigid Over Head Electrification (OHE) and Telecom system for the entire 22.87km NS corridor

BANGALORE METRO

L&T has constructed 9 elevated Metro stations and Station E&M for 7 UG stations employing innovative construction technologies. For Phase-2, L&T is constructing 5.64km UG section along with 5 UG stations.

L&T is also executing Multiple packages in Phase 2 including Ballastless Track works Package 2A (Central Silk Board to Krishnarajapura) and 2B (Krishnarajapura to Kempegowda International Airport) in the Viaduct section including trackworks for the depots at Baiyanappanahalli and Airport.

KANPUR & AGRA METRO

L&T has installed the ballastless trackworks and fastening systems for the entire stretches of 32.4 km Kanpur Metro and 29.40 km Agra Metro's Phase 1 projects.

L&T has also delivered 750 V DC Third Rail electrification system of Agra Metro Phase 1 project

Agra Metro (56tkm) Track & DC Traction with 3rd rail system

68 Km MGR Railway line for 2X660 MW OPGC Power Plant

DEDICATED RAIL LINKS AND MERRY GO ROUND SYSTEMS

Linking Core Sectors to Mainline

L&T offers end-to-end rail connectivity solutions for coal links and core sector developers viz; power, steel, aluminium, cement plants along with installation of associated bulk material handling equipment.

Port Connectivity

66 km link from mainline to port including centralised traffic control and associated bulk material handling for Dhamra port at Odisha.

Coal Links

- 45 km coal link to 4x600 MW thermal power plant - Sterlite Energy, Odisha
- 21 km coal link to 2x525 MW thermal power plant - Maithon Power, Jharkhand
- 45 km coal link to 2x700 MW thermal power plant - Nabha Power, Punjab
- 48 km coal link to 2x210 MW Thermal Power Plant, Odisha Power

Core Sector Developers

- 25 km link to 0.5 MTPA cement plant for Lafarge Cement at Chattisgarh
- 7.1 km link to 10 MTPA iron ore processing unit for Tata Steel at Joda iron ore mines
- 28 km link to bauxite mines for Bharat Aluminium (BALCO) at Chattisgarh

Dedicated Railway Link for Tata Steel, Joda iron ore mines

Rail Link to Lafarge Cement Plant, Chattisgarh

RAILWAY FREIGHT HANDLING FACILITIES

At 6 locations for Etihad Rail Stage 2 Expansion

Freight Terminal in the Industrial City of Abu Dhabi (ICAD), spanning over 2.7 million square feet - the largest inland freight railway terminal in UAE Railway Network.

L&T along with Power China has designed and built the freight handling facilities (2F2 Pkg) at 6 strategic locations across the UAE viz; Industrial City of Abu Dhabi (ICAD), Khalifa Port, Dubai Industrial City, Jebel Ali Port, Al Ghayl, and Fujairah Port. The freight facilities would promote the UAE's position as a global logistics hub and an active and key player in the field of logistics.

The scope of work involves design, engineering, procurement, construction, and commissioning of bulk material handling systems (Rail loading and unloading systems) with associated civil and structural works, bulk material storage facilities, general cargo and container handling facilities including freight terminal management and control systems.

All the freight stations include Railway siding and Track works and other infrastructure works such as bridges, buildings, roads & drains, water, power and utility systems.

66 km link from mainline to port including bulk material handling for Dhamra port at Odisha.

45 km coal link and coal handling facilities - Nabha Power, Punjab

BRIDGING IDEAS

All types of steel / concrete bridges

Having executed over 220 km of bridges and viaducts of various kinds, L&T has introduced several innovations in the construction of major steel and concrete bridges for rail infrastructure and has extensive experience in a wide range of bridges and viaducts using ingenious techniques such as:

- Incremental launching
- Segmental construction
- Cable-stay
- Precast, pre-stressed concrete
- Steel, concrete composite construction

60m high, 420m long Viaduct across Panvel river valley near Ratnagiri India - Built using Incremental launching

33.4 km Katni Grade Separator

Katni Railway Grade Separator

L&T is building the complex 33.4 km Katni Grade Separator which when completed, it would be India's longest railway viaduct and the second longest in Asia. The bridge would speed up freight traffic from the Singrauli - Katni (WCR) and Bilaspur - Katni (SECR) lines to the Katni - Bina line. The project involves 665 girder spans manufactured in-house in workshops equipped with new-age CNC equipment.

Viaduct construction in Mumbai Ahmedabad High Speed Rail (Viaduct Pkg C4 237.1km) - Full Span Girders weighing around 980 MT being launched using Launching Gantry

Jhajjar khad bridge in Jammu Udhampur Rail link

Landmark Bridges in Himalayan Ranges

Gambhir Khad and Jhajjar Khad on the Jammu-Udhampur rail link which are among the tallest in the country.

5.13 Km long Rail Bridge over Rupsa River, Bangladesh Railways

Rail Viaduct crossing Trunk routes - WDFC CP 303

Gambhir khad bridge in Jammu Udhampur Rail link

SWANKY STATIONS WITH COMPLETE AMENITIES

L&T provides comprehensive design and build solutions from concept to commissioning for building stations and depots, comprising MEP works, vertical and horizontal transportation, building automation systems, IT systems and system integration

Structures for mass transit systems can be delivered complete with E&M installations and services such as automated fare collection, passenger information display systems and firefighting systems for railways and metro operations on a turnkey basis. L&T holds an enviable track record of being involved in the construction of over 170 stations across the country with more than 17.5 million sq.m of building spaces completed in the last 3 years.

State-of-the-art Station at Riyadh Metro Line 3

Station at Doha Metro Gold Line

Underground Station Building Mumbai Metro Line 4

Nagole Station - Hyderabad Metro

DEPOTS AND MAINTENANCE FACILITIES

From concept to commissioning, L&T has the expertise to set up Rolling Stock Maintenance Facilities for Locomotives, Freight and Passenger coaches including procurement and installation of maintenance equipment, high tonnage gantry cranes, material handling systems and specialised utilities.

The company draws from its experience of setting up factories for various heavy industries to construct pre-engineered buildings and structures.

L&T has also set up depot and stabling yard facilities for various Metro/LRT transit systems at Delhi, Chennai, Hyderabad and at Mumbai for Monorail.

Uppal Depot - Hyderabad Metro

State-of-the-art Wagon Repair Workshop for Indian Railways - Jhansi

Wheel lathe at Wagon repair shop - Jhansi

Najafgarh Depot – Delhi Metro

Passenger Car Mid-life Rehabilitation Facility for Indian Railways – Jhansi

TUNNELING TECHNOLOGY

Powerhouse in Modern Day Transport Systems

In Delhi Metro project Phase 1, L&T has executed a 6.6 km UG section including a three level interchange station at Connaught Place (Rajiv Chowk) and India's deepest station (Chawri Bazaar) at the historical old Delhi.

L&T has executed over 55 km of TBM and 31 UG stations for the Riyadh, Doha, Delhi and Chennai Metros.

For the railway mainline, L&T has built significant portions of Rishikesh - Karnaprayag Railway line involving 12.9km of NATM and over 15 km of TBM in varying geological conditions. In the past, L&T has built tunnels through some of the toughest sections of the Western Ghats for Konkan Railways.

India biggest Hydroshield TBM "Mavala" with excavation diameter 12.19 m excavates through challenging geological conditions under the sea for Mumbai Coastal Road Project. L&T holds the world record to have tunneled 455.6m in a month.

L&T executing two packages in Mumbai Metro Aqua Line UGC 01 and 07 - combination of TBM and NATM

14m dia (Double Track, High Rise OHE) Railway Tunnel through Drill & Blast method in Aravalli Hills with large scale deep cut section to Tunnel approach - WDFC CTP 14 Project

12.9km (6.2km+ 6.7 km) of NATM tunnel in Pkg2 of Rishikesh Karnprayag Railway Line. L&T holds the record of 1012m of NATM in 26 days amidst varying Himalayan geological formations L&T is also executing 15rkmof TBM as part of Pkg 7

Full Span Launching Gantry & Girder Transporter - MAHSR, India

LEADERS IN PRECAST TECHNOLOGY

State-of-the-art precast technology is employed for faster completion of projects across several railway and urban transit projects. Concrete elements such as viaduct segments, full span 'U' girders, tunnel lining rings, armour units, deck element and guideway beams for monorail and even concourse and platforms of station buildings are prefabricated in the state-of-the-art casting yards.

Pre-Cast Ballastless Track - Key to a smooth ride in High Speed Rail Connectivity

Having pioneered the construction of Direct Fixation Resilient Track Systems (Cast in-situ plinth type), L&T is also a major player in executing all types of Pre-Cast Ballastles Track System including Slab types (PORR, J-Slab) and LVT Blocks

Pre Cast Slab Track Construction in MAHSR Project

Concourse and platforms levels constructed entirely from pre-cast sections for Hyderabad Metro stations

Double Decker Metro Corridor – 3.9 Km – CMRL ECV-01 Project

Plasser SVM 1000 at CTP 3R project - Mechanized methods for track linking results in high quality and speedy execution.

Mechanised Wiring Trains - Enabling high productivity through simultaneous stringing of conductors under tension

BEST IN CLASS MECHANISED TRACKWORKS & OVERHEAD ELECTRIFICATION

L&T has been creating a unique differentiator inline with its vision to be Full Range Rail System Integrator.

Our Experience in Mechanized Track Construction and overhead Electrification is a key enabler for 'Scale and Speed' and results in high quality and rapid project execution.

Unimat

Tamping and Ballast Profiling

Ballast Profiling (Kershaw)

Mechanised Cylindrical Mast foundations in WDFC

Harsco NTC Machine at WDFC CTP 14 Project

Mast Grabber (Geismar)

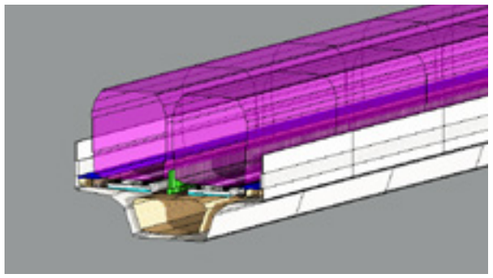
L&T Campus at Faridabad, India

DELIVERING WORLD-CLASS DESIGN

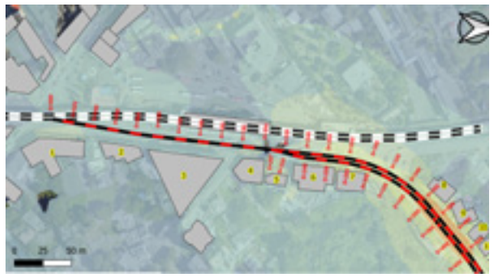
A well-equipped design facility, Engineering Design and Research Centre (EDRC) at Chennai and Faridabad, provides a broad spectrum of design services ranging from concept to commissioning for all types of projects in the rail and urban transit sector.

EDRC provides construction engineering services for:

- Bridges
- Viaducts
- Guideway beams
- Permanent way works
- Overhead equipment including power supply and traction substations
- Ballastless track work
- Signalling and telecommunications
- Special infrastructure requirements
- Tunnels and underground structures
- Building services
- Hydrology
- Electrical and instrumentation system engineering
- Geotechnical engineering

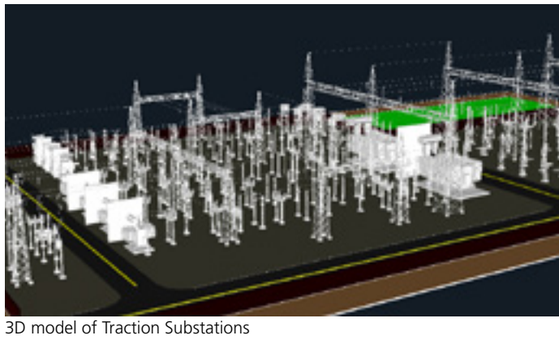


3D Model for Design Integration & Automation in RRTS

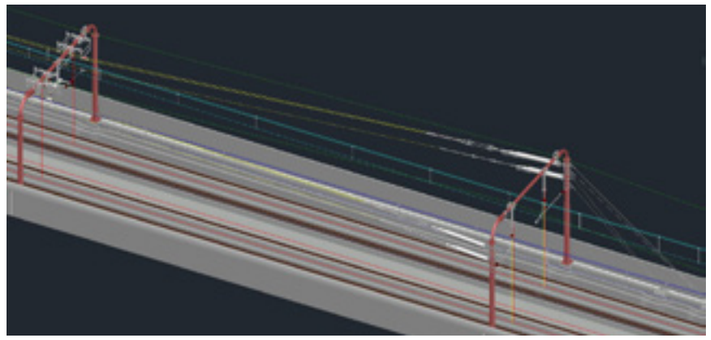


Noise and Vibration Mitigation in Mauritius LRT

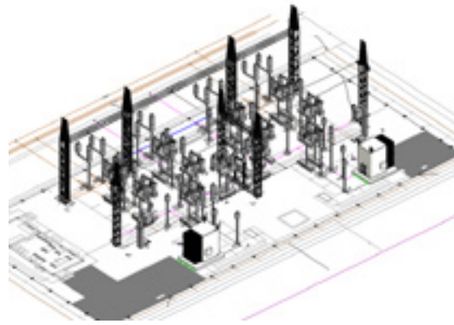
Building Information Modelling (BIM) - Extensive usage of BIM for Integration of Track and Electrical components



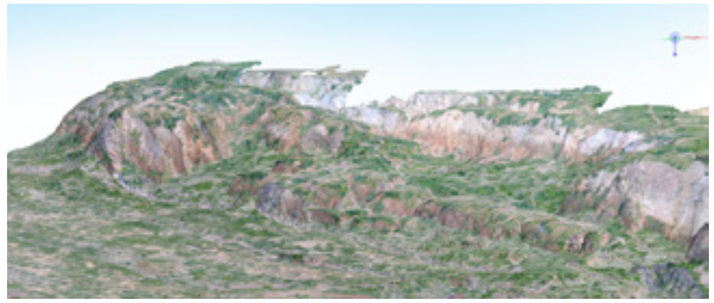
3D model of Traction Substations



3d model of OHE and Portals - Dhaka Metro

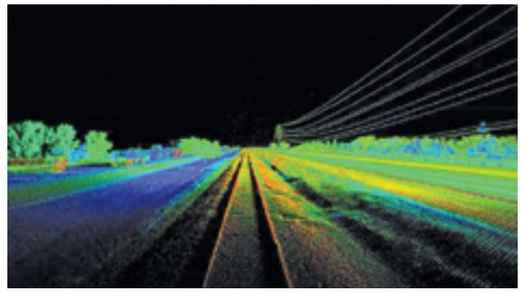


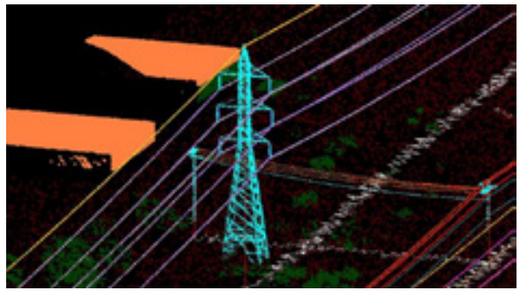
Traction Sub Station



Processed Topography through Drone based Photogrammetry for alignment design

Alignment selection / hindrance detection using LiDAR





Topography Point cloud Data through Mobile/Airborne LiDAR

A section of the Competency Development Centre near Chennai

COMPETENCY DEVELOPMENT CENTRE

Open Training Yard for Track Laying, Railway Electrification and Signalling & Telecom at CDC

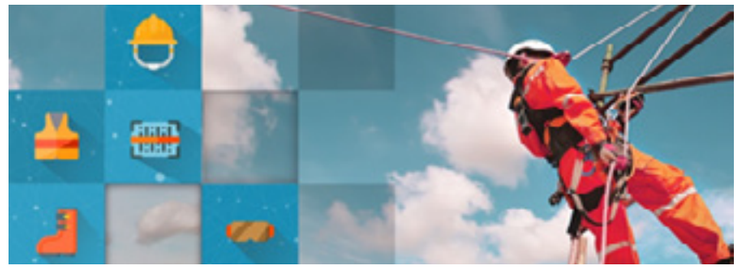
Comprehensive training for excellence in rail infrastructure

Towards fulfilling the demands in rail construction, L&T has established the Competency Development Centre (CDC), a first of its kind exclusive training centre for rail construction at Kanchipuram, near Chennai, for various activities based on the requirements of an integrated rail construction project.

Equipped with excellent infrastructure for practical and classroom sessions, CDC has the facility to impart on-site training to 300 technicians and 180 middlelevel managers / engineers in a year. Specialised training is provided in permanent way works, overhead electrification, signalling & telecommunication and complete civil construction works.

BUILDING A SAFETY CULTURE

At L&T, we have always been committed to the health and safety of employees; we were one of the earliest to start reporting Safety data in our Sustainability Reports. Today, new age technologies are ushering in a new dimension of safety at our work sites.



Scenario demonstration thru Virtual Reality Training

Digital Solutions to Manage Safety Process

Safety Training through VR and AR

Good safety begins with awareness and training and we are using innovative digital technologies to impart such training to our workmen.

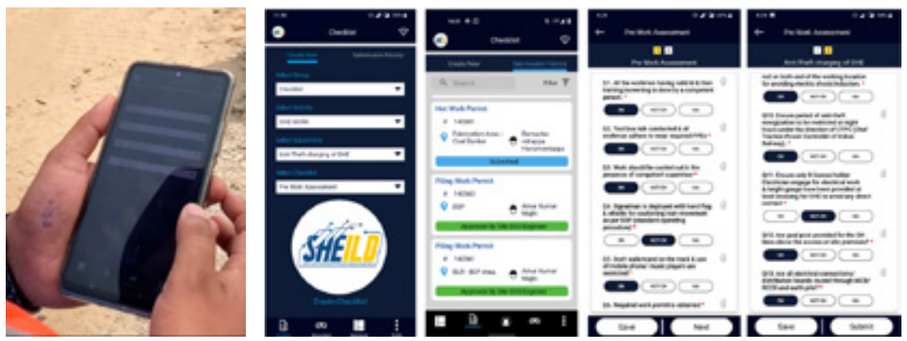
L&T has adopted Immersive Virtual Reality modules to demonstrate safety practices covering multiple scenarios like working at heights, working at excavation sites, working adjacent to Operational Railway Lines. These films, help create a vivid immersive experience and imprint the rules of safety firmly in the minds of workmen.

Training modules: Track work Safety| Work at Height | Electrical Safety | Excavation Safety

Digitalisation of Safety checklists and Permits

The SHEILD Safety App in use at all our project sites has digitized all the safety processes like safe to start, pre-start inspections, near miss and incident reporting and rectification.

The data from this app enables online real-time reviews of safety, and analytics on this data enable trends and patterns to be identified for effective rectification actions and improvements.



Digitalisation of Safety checklists and Permits | One touch access to all safety info.

Railway Business Group

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