



Make in India PPP



Marhowra Project

Celebrating 6 years of India's fastest PPP project



**BASIC
DETAILS**



Value of Contract
2.6 B\$



Equity of JV Partners
Indian Railways | Wabtec
₹100 cr | ₹300 cr



Overall Infrastructure Investment
₹1200 Cr
+ Land for Factory & Shed
+ Incoming Station at Marhowra
+ Road by IR



Historic Locomotive order

Indian Railways ordered 1000 Fuel-efficient Evolution series locomotives in November 2015, spread over eleven years. As part of the project, Wabtec has built a diesel locomotive factory in the Marhowra district in India's state of Bihar, as well as maintenance sheds at Roza in Uttar Pradesh and Gandhidham in Gujarat.

Infrastructure



Total Land Allocated
200 Acres



Total Area for Manufacturing Footprint
70 Acres



Start of **Operations**
At Marhowra. September 2018.
Facility constructed and start of operations in 3 years from award of contract and 2 years from Land allocation



Capacity
120 Locos
per annum.
1 Loco every 3rd day



Manufacturing Capability upto **6000 HP**
Currently supplying 4500 HP & 6000 HP



Infrastructure at Marhowra
Factory + Township with 100 Dwellings for Staff + Community Centre + Administrative Block + Health Centre + Gym



Total Staff
600

Key Highlights

Global Supply Chain:
60 Local & 10 Global suppliers established manufacturing in India

Diversity: 25% in Manufacturing Team
Skill Development Centre:
270+ Women trained

Job Creation:
5000+ Direct & Indirect Jobs

Delivered all critical Milestones as per PCMA



Key Benefits To Indian Railways

Fuel Efficiency (SFC):
5% better than PCMA requirements

Ergonomic Operator Cab:
↑ Driver Efficiency

Increased Haulage thru ↑ Starting Tractive Effort: ↑ Freight Revenues

Procurement of Parts:
In-house 80% Components



WDG4G/6G

State-of-the-art
Locomotives made
at Marhowra



Key Features & Specifications

General Specification	WDG4G	WDG6G
Starting tractive effort	544 KN	570 KN
Maximum operating speed	100 km/hr	
Wheel diameter	1092 mm	
Gear ratio	85/18	85/16
Gauge	1676 mm	
Fuel tank capacity	6000 litres	8000 litres
Weight	132 tonnes	138 tonnes
Maximum adhesion	42%	
Minimum availability	95%	
Maintenance interval	92 days (minimum)	
Clearance	IR MMD 1D (EDO/T-2202)	
GHP / THP	4500 / 4260*	6000 / 5686*
Continuous TE	405 kN**	420 kN**
Max. braking effort	270 kN**	286 kN**
Nominal axle load	22 tonnes	23 tonnes

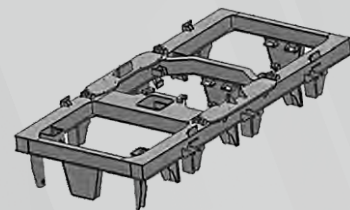
* - @ AAR conditions
** - With half worn wheel on dry, tangent, clean ail

* - @ AAR conditions
** - Calculated with half worn wheel
- SOD compliant to IR MMD 1D (EDO/T-2202)



Crew Comfort Cab : >Efficiency

First ergonomic cab layout. Thermo-acoustic insulation. Crew comfort – reduced noise. Larger HMI screens. EN12663 Cab frontal collision: Driver safety. Enhanced operator amenities – HVAC, hot plate, urinal, heated windshield.



Fabricated Bogie

Lightweight fabricated truck frame – EN13749 fatigue tested. Minimum wear surfaces – maintenance-friendly



State-of-the-art Engine:

4 stroke engine - 12 cylinder (4500 HP) / 16 cylinder (6000 HP)
First engine with electronic fuel injection. Best-in-class fuel efficiency: 8% ↑ First Emissions compliant (UIC 1) engine
Isolator mounts - reduced vibration: ↑ component life
Advanced split cooling system

Service Shed: Roza



Roza Maintenance Shed: A State-of-the-art Smartshop

- 1st Maintenance Shed set up by Wabtec on Design, Build and Operate model
- More than 160,000 sq. ft. on 20 acres of Indian Railways land at Roza, Uttar Pradesh
- Maintenance Shed will have state-of-the-art RM&D (Remote Monitoring and Diagnostics) infrastructure
- Training Institute with a simulator and hostel for training IR drivers and maintenance staff
- All locomotives in the fleet are monitored 24x7 with sensors remotely and a set of sophisticated algorithms diagnose and suggest maintenance actions
- Roza will be fully staffed by trained Wabtec technical professionals and workforce
- Has set new maintenance standards in terms of locomotive availability and reliability



Total Land Allocated
20 Acres



Homing of
250
Locos



Start of Operations
2018



Total Staff
250



Entry Level
Diploma Engineers



4500 HP
@225 Nos.
6000 HP
@25 Nos.



Capability to Service upto
6000 HP
Diesel Locomotives



24x7
Prompt
Response Teams



Fleet Kms :
67 Million
till Jan 2022

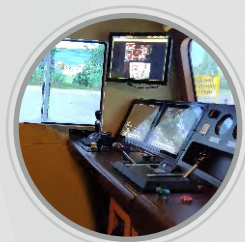
from
Govt Polytechnic
Colleges of U.P.
and surrounding areas



Predictive
**Maintenance
Tool**



Simulator-based
Training



5500+
Loco Pilots Trained



2000+
Regular Maintenance
Schedules Completed

Availability:
95%: ↑ Freight Revenues

↑ **Operational Efficiency resulting in ↓ Dwell time in shed:** ↑ Availability for utilisation & Freight Revenues

Service Shed: Gandhidham



Key Facts

1st Maintenance shed with Partnership of Indian Railways & Wabtec in the country with a unique model of Wabtec supervisors and Indian Railways technicians



Total area

30 Acres



Homing
250

locomotives each,
scalable



Trained & certified

153 IR Team

members
on Wabtec Loco



Prompt

**Response
Teams**



Modern Shed

to deliver high (95%)
availability of locomotives



Total investment

₹220 crore



Jobs created

400 Persons

(direct & indirect)



Operations supported by

24x7 Helpline



SMART Shop

Lean flow of locomotive
to reduce 'In shed' time

Loco Shed

- 5 Lines with 4 Loco positions
- 2 RM lines, 2 lines for unscheduled repairs and 1 for Heavy and Wreck repairs.
- Wider Platforms for better material storage and man movement.
- 18 Computer Kiosks at every Loco Station for entering maintenance.



Admin Block

Demarcated – PPE & Non-PPE Zone Admin Block with Office, Kitchen and Cafeteria facility.



Track

- 3.65 km – track length, 13 derailer switches.
- Wrap around line for faster loco movement.



Warehouse

- Total area: 738 sq.m. with Location-based ERP monitoring.



Consumable Storage

- Lube Oil Storage (35 KL)
- Diesel Storage Yard (35 KL)
- Used Oil (20 KL)



Load Box

- 2 separate load boxes - 1850 kW each



Environment-friendly

- Zero discharge facility with ETP & STP
- Neutral water consumption with Rainwater Harvesting
- Treated water to be used for gardening
- Energy Efficient Lighting (100% LED)
- Organic composter for utilization of kitchen waste



Safety & Security

- Fire fighting system
- Fire alarm and detection system
- Smoke detector system along the central monitoring system
- CCTV system



Health Centre

- First aid facility along with ambulance

Regular Maintenance:
90 Days: ↑ Freight Revenues

Unique Location to facilitate Heavy Haul Operation. Unique Location to facilitate freight Operation from Ports in Western Region.

Corporate Social Responsibility (CSR)



Community Development Initiatives - Swabhiman :

- ~300+ Women candidates trained in Tailoring & Personal Care
- 40% Women are now earning
- 14 Villages covered through Project



"Shahshiksha" :

- Together for Educational Equity
- 450+ Enrolled Students Class 1 to 8, 9 teachers
- Student Teacher Ratio: 50:1
- Engineers volunteering to teach every Saturday in school, engaging every month
- Infra: Undertaken repairs for fresh look, new flooring, wall colour and providing bench desk to students



Healthcare Consultation Centre :

- Tejpurwa village : Average 1000+ villagers benefitted in the year
- Other initiatives : Installation of 118 solar street lights in 13 villages
- Healthcare Camps : ~ 1000 persons
- Solar Lamps
- Beneficiaries with Healthcare Kit
- Weld School At New Government Polytechnic, at Pataliputra, Patna
- Under Department of Science and Technology, Govt. of Bihar 1st Centre of Excellence in Bihar: with Industry Partnership

Strategic Approach



Thematic Areas



Education/Skill Development



Healthcare



Green Energy/Environment

Employee Volunteerism



Volunteering in company sponsored projects

Swabhiman Project



1 Training Centre



2018 Launched



300 Trained in Beautician/Tailoring



125 Earning Post Training



13 Villages from 5 GPs



2 Courses



4 Received Mudra Loan



5 Own Beauty Salons



**Level-4 NSQF
Certified course**

Weld School at New Government Polytechnic Pataliputra, Patna



**1st Batch :
15th August**



**30 candidates
in every batch:
Bihar**



**NGP,
Patna
Start : 28th July**



**Curriculum : 710 Hrs
Training including 490 hrs
practical training**



Recognized for the Best Skill Development Program at the Tata Institute of Social Science (TISS) - Leapvault CLO Awards India. The award honours the investment Wabtec made in its employees through learning and skill development initiatives.



Wabtec and New Government Polytechnic, Patna set up Centre of Excellence in Weld Technology

Wabtec in India



**Largest Installed
Base for Rolling
Stock & Equipment
(Locomotives
LHB Coaches
Metro Cars)**



**Employees:
3000+**



**Revenue:
660M\$+**

**Operational Footprint
~3Mft sq meter**
Global Engg Centre
1350+



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