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Executive Summary

"Improving Quality, Productivity & Innovation for Enhanced Competitiveness of Indian Bicycle & Bicycle Parts Industry" using 5S and Kaizen



United Nations Industrial Development Organization (UNIDO)

Oct 2025 - Jan 2026

#GTBharat
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Reader's Guide

UNIDO is a specialized agency of the United Nations with a unique mandate to promote, dynamize and accelerate industrial development. UNIDO provides support to its 173 Member States through four mandated functions:

- Technical cooperation
- Action-oriented research and policy advisory services
- Normative activities related to standards
- Facilitating partnerships for knowledge and technology transfer

One of its initiatives in India is the project titled **"Improving Quality, Productivity, and Innovation for Enhanced Competitiveness of the Indian Bicycle and Bicycle Parts Industry"**, which leverages **5S and Kaizen methodologies**. This project is supported by the **Department for Promotion of Industry and Internal Trade (DPIIT), Ministry of Commerce and Industry, Government of India**.

Under this program, 15 MSMEs were selected by the **All India Cycle Manufacturers Association (AICMA)** and the **United Cycle and Parts Manufacturers Association (UCPMA)**.

As part of the program, **Grant Thornton, nominated as a technical advisor,** evaluated these 15 MSMEs to facilitate improvements leveraging 5S & kaizen methodologies. This report covers identified opportunities, recommendations, implemented actions & associated benefits for these 15 MSMEs.

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We extend our heartfelt gratitude to our esteemed partners for their invaluable contributions



UNIDO (United Nations Industrial Development Organization)
For conceptualizing and organizing this transformative program aimed at strengthening the bicycle and bicycle parts industry.

We sincerely thank **Ms. Shraddha Srikant, Mr. Virag Muley** and **Mr. Vijay Bhatt** from UNIDO for their instrumental role in encouraging MSMEs to participate actively.

AICMA (All India Cycle Manufacturers Association) & United Cycle and Parts Manufacturers Association (UCPMA)
For mobilizing and aligning MSMEs, ensuring their active participation and readiness for this initiative.

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GT & UNIDO Visit – A Glimpse of Our Journey



GT and UNIDO team visited five MSMEs on 3rd & 4th December 2025 to review the program's progress and motivate the MSMEs to actively participate in the program.

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01 Project Summary

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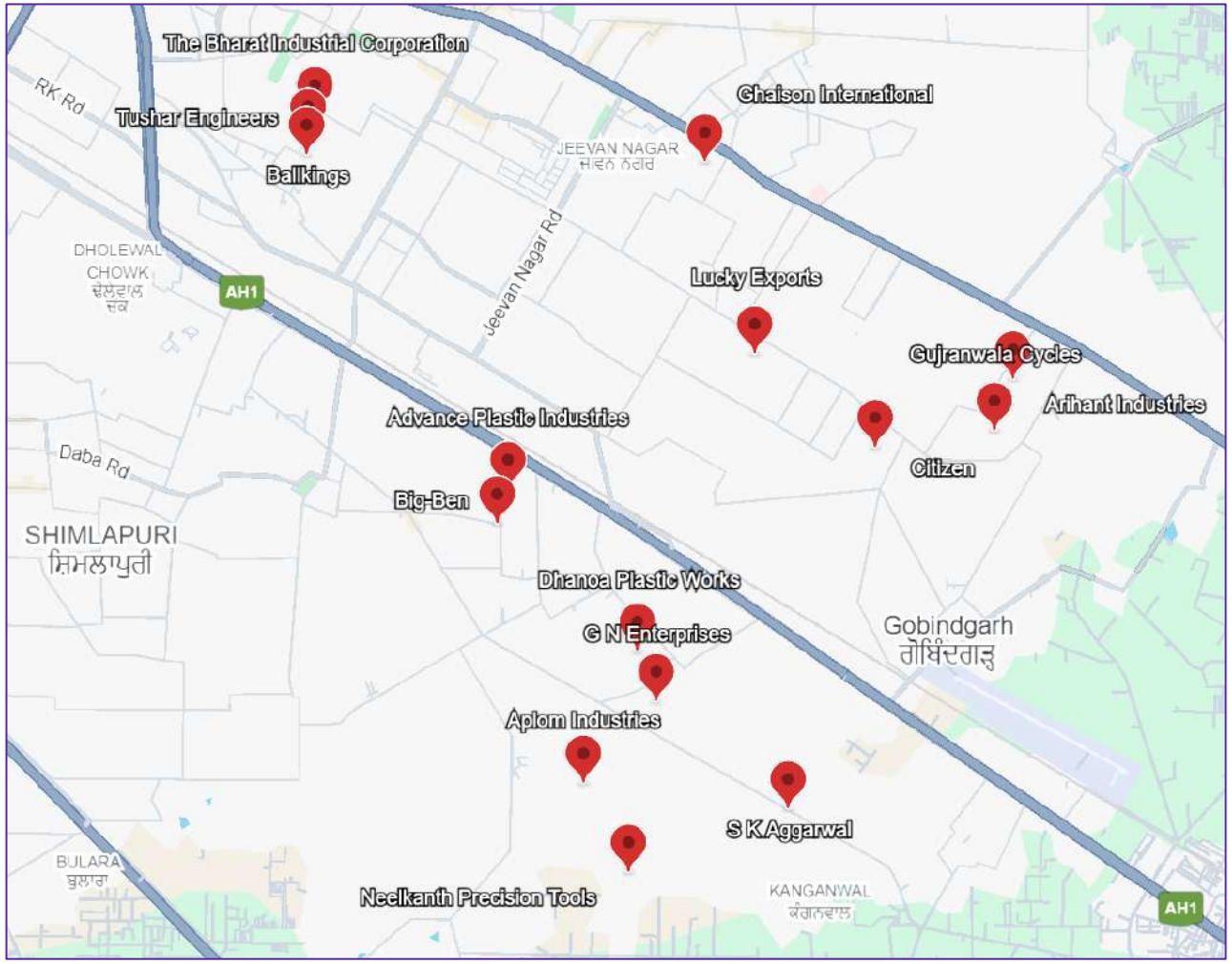
MSMEs Location within Ludhiana



List of 15 MSMEs

- The Bharat Industrial Corporation
- Tushar Engineers
- Ballkings
- Ghaison International
- Lucky Exports
- Gujranwala Cycles
- Arihant Industries
- Citizen
- Advance Plastic Industries
- Big-Ben
- Dhanoa Plastic Works
- G.N. Enterprises
- Aplom Industries
- S.K. Agrawal Industries
- Neelkanth Precision Tools

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Summary of Opportunities and Savings (1/2)

253
Total opportunities addressed

357
Total opportunities identified

26
Opportunities horizontally deployed

32
Kaizen implemented

66,98,270
Total recurring benefits in INR (per annum)

16,38,000
One Time Benefit in INR

47
Avg. baseline score

66
Avg. post-implementation score

	Baseline	Post Implementation
Min. Score	24	38
Max. Score	74	91

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Summary of Opportunities and Savings (2/2)

S. No.	Assessment Score (Out of 120)	Post Implementation Assessment Score (Out of 120)	Opportunities Identified	Opportunities Addressed	Recurring Benefits in INR (per annum)	One Time Benefits in INR	Kaizen Implemented	Opportunities Identified and Implemented by MSME (Horizontal Deployment)
01	74	91	46	39	29,39,880	3,44,000	8	2
02	68	85	33	20	–	10,000	–	–
03	62	80	35	20	–	6,60,000	1	–
04	54	80	26	26	19,82,000	1,35,000	2	9
05	55	77	23	23	35,500	54,000	4	6
06	60	71	12	12	–	–	–	–
07	43	69	26	23	11,30,890	40,000	10	9
08	34	61	28	19	5,20,000	1,90,000	2	–
09	42	55	40	8	–	–	3	–
10	30	45	25	20	90,000	–	1	–
11	24	43	29	21	–	2,05,000	1	–
12	24	38	34	22	–	–	–	–

Note: Several opportunities are still pending action from the MSMEs, as the planned implementation timelines extend beyond the program duration. Please refer to the project report for further information.

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02

Assessment Criteria & Checklist

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Assessment Criteria

0 : Not implemented (No evidence of activity or awareness.)

1 : Partially implemented (Some efforts made, but inconsistent or informal; lacks proper documentation or effectiveness.)

2 : Moderately implemented (Activity is in place and somewhat consistent, but improvement is needed in execution or impact.)

3 : Well implemented (Activity is consistently practiced, documented, and shows positive results, but minor gaps exist.)

4 : Implemented and sustained (Activity is well-established, regularly reviewed, documented, and shows strong effectiveness and continuous improvement.)

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Assessment Checklist (1/3)

	Section Name	S. No.	Check Point	Location	Score (0–4)
1	Management Commitment	1.1	Is management actively committed to achieving program objectives?	Office	
		1.2	Is the plant team fully aligned with the program objectives?	Gemba	
2	5S systems	2.1	Is there a 5S system defined & established?	Gemba	
		2.2	Is a 5S committee established to drive 5S initiatives?	Gemba	
		2.3	Are audit scores and trends available (self-audit/customer audit)?	Gemba	
		2.4	Are actions taken based on audit findings?	Gemba	
3	Employee Morale - Kaizen	3.1	Is a suggestion scheme established for employees?	Gemba	
		3.2	Are employees encouraged to submit suggestions, and are these implemented?	Gemba	
4	RM Store	4.1	Is illumination at raw material storage areas adequate (200 lux)?	Gemba	
		4.2	Is Minimum & Maximum inventory level defined & followed?	Gemba	
		4.3	Is location fixed to keep the raw material?	Gemba	
		4.4	Is visual aids like floor markings and signage for storage zones?	Gemba	
		4.5	Is FIFO (First-In-First-Out) system is followed?	Gemba	

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Assessment Checklist (2/3)

	Section Name	S. No.	Check Point	Location	Score (0–4)
5	Manufacturing process	5.1	Are shop floor employees aware of 5S principles?	Gemba	
		5.2	Is there any unidentified Material, Tools & Dies kept on shopfloor (Hold, rejection, Obsolete, Rework)	Gemba	
		5.3	Is there designate fixed locations for tools, jigs, and fixtures with labels or shadow boards in the plant?	Gemba	
		5.4	Are machines maintained in good condition (clean, no oil leakage, no dirt)?	Gemba	
		5.5	Are there any loose wiring, hanging objects in the shopfloor?	Gemba	
		5.6	Is material kept directly on floor?	Gemba	
		5.7	Is there an effective system to communicate customer-end defects to shop floor personnel?	Gemba	
		5.8	Is the plant layout optimized for smooth material flow from raw material to finished goods?	Gemba	
6	Inspection Stations & FG area	6.1	Is customer complaint data maintained and kept up to date?	Office	
		6.2	Is adequate space provided for line QC inspectors to check products?	Gemba	
		6.3	Is illumination at in-process inspection stages adequate (300–700 lux)?	Gemba	
		6.4	Is illumination at finished goods storage areas adequate (200 lux)?	Gemba	
		6.5	Is a designated area available for quarantining suspected batches/lots during production?	Gemba	

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Assessment Checklist (3/3)

	Section Name	S. No.	Check Point	Location	Score (0–4)
7	Office Area	7.1	Are there any unwanted documents, material kept in office area?	Gemba	
		7.2	Is location defined to keep the document file?	Gemba	
8	Safety	8.1	Is monitoring of unsafe acts and unsafe conditions carried out regularly?	Gemba	
		8.2	Are periodic safety training sessions conducted for all employees?	Office	

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03 Key Observations & Recommendations

Key Observations & Recommendations (1/2)

#	Observation	Recommendation	Impact
1	Scrap, unidentified and mixed materials is kept across shopfloor	Define fixed labeled locations for RM, WIP and FG. Create dedicated scrap zones and ensure regular disposal. Segregate obsolete and unusable material.	Improved working capital, better space utilization and improved traceability
2	Electrical hazards including loose wiring and exposed panels	Route cables properly using trays or conduits. Secure all wiring and repair broken panels. Improve cable management practices.	Lower electrical and fire risk and reduced downtime
3	Obstructed or unclear walkways	Mark walkways clearly. Maintain obstacle free movement areas. Define parking zones for trolleys and bins. Repair damaged flooring and improve cleaning frequency.	Higher safety, easier accessibility and faster evacuation
4	Poor ventilation	Repair/replace exhaust systems.	Higher safety
5	Ergonomic issues in packing and handling including heavy crates and packing on floor	Set crate weight limits and use rollers or wheels. Provide proper packing tables. Define packing areas clearly. Shift packing closer to assembly to reduce movement.	Improved ergonomics and higher productivity
6	Inefficient assembly flow with excess movement and manual counting	Align or merge lines to improve flow. Install automatic counters with OK, Hold and Reject segregation. Redesign layout to reduce WIP and unnecessary material/man movement.	Reduced cycle time, manpower savings and increased productivity
7	Poor storage discipline including unlabeled bins, undefined locations and weak visual management	Define and label storage locations. Use racks and pallets. Introduce shadow boards. Use color coding and tray or bin labeling for clarity.	Better traceability, faster search time and safer workplace

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Key Observations & Recommendations (2/2)

#	Observation	Recommendation	Impact
8	Unorganized or poorly maintained dies and fixtures	Create dedicated labeled storage with clear identification.	Faster changeovers and more efficient space usage
9	Machine related issues such as leaks, loose hoses, coolant wastage and poor cleanliness	Fix all leakages. Secure hoses properly. Apply daily cleaning routines. Follow preventive maintenance schedules and use drip trays when required.	Reduced downtime and energy/coolant savings
10	Improper chemical storage and unlabeled drums or bags	Label all chemicals clearly. Store chemicals on pallets or racks. Segregate chemicals based on type and ensure spill containment readiness.	Safer chemical handling and reduced storage risk
11	Unsafe gas cylinder storage and handling	Define safe storage areas for cylinders. Secure cylinders with chains or clamps. Use cylinder trolleys for movement.	Higher safety and statutory compliance
12	Blocked emergency access and fire safety issues	Keep all emergency exits and fire equipment unobstructed. Improve signage and perform regular checks and drills.	Better emergency preparedness and improved response time
13	Poor infrastructure including water leakage, unsafe stairs and damaged floors	Improve drainage systems. Repair floors and stairs. Add handrails and safety barriers where needed.	Improved hygiene and safer workplace
14	Unsafe mold storage and trolleys blocking gangways	Define structured mold storage using racks. Mark fixed parking areas for trolleys to keep gangways clear.	Reduced mold damage and improved shopfloor safety

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04

Few Key Opportunities

Note: MSMEs requested support from the GT team for process improvements. The GT team studied their processes and provided detailed recommendations. Please refer to the project report for further information.

Kaizen

Expected Annual Benefits

Rs. 2,10,000

Plastic Coating Area

Current State



Improved State



Observation

Material (to be packed in batches) is placed on the ground

Recommendation

Pack material directly as it is out of oven.

Impact

1. Space saving
2. Improved working capital through reduction in inventory

ITD: 30th Nov 2025

IAD: 30th Nov 2025

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Trobe Machine Area (1/2)

Current State







Observation

Nuts produced by the Trobe machine are mixed with chips and burrs, requiring manual segregation by workers. This process is time-consuming, labor-intensive, and results in poor housekeeping and reduced operational efficiency.

Expected Annual Benefits

Rs. 90,000

Refer next slide for recommendation

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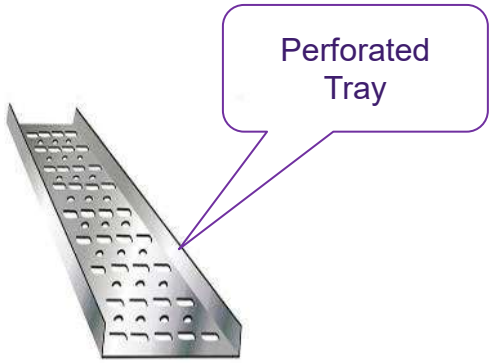
Kaizen

Expected Annual Benefits

NA

Trobe Machine Area (2/2)



Improved State





Recommendation

A perforated tray should be fitted to the Trobe machine so that nuts can be collected directly and transferred into a bin, while chips and burrs remain separated.

Impact

1. Reduced risk of cuts & injury
2. Improved productivity
3. Reduced manual labor
4. Cost saving

ITD: - 05-Dec-25

IAD:

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Kaizen

Expected Annual Benefits

Rs. 3,60,000

Saddle Assembly Line

Current State



Improved State



Observation

Saddles are assembled on two sequential assembly lines in batches, requiring additional cleaning and material movement before they are transferred to Line 2.

Recommendation

Combine both assembly lines into a single continuous flow line.

Impact

1. Improved process efficiency and reduced cycle time.
2. Reduced labor and material handling costs.

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ITD:

IAD: 04th Jan 2026

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Kaizen

Expected Annual Benefits

Rs. 20,54,880

Surface Area

Current State



Improved State



Observation

Crates are too heavy to pull and push. Additionally, some crates are not kept in the correct position, creating ergonomic issue and safety risks.

Action

1. Defined a maximum weight limit for crates to prevent overloading and implement a mechanism such as rollers or wheels to make handling easier.
2. Ensured proper stacking and positioning of crates

Impact

1. Improved safety
2. Improved ergonomics
3. Organized storage area

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ITD: Dec`25

IAD: Dec`25

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Zinc Plating Section

Expected Annual Benefits

Rs 19,82,000

Current State





Improved State



Observation

Break levers loaded on hangers for zinc plating are below optimal capacity, and some hangers are broken, impacting the operational efficiency

Recommendation

1. Repair & Replace broken hanger/ hook
2. Schedule regular inspection of hooks and hangers

Impact

1. Improved plating plant productivity by 20%
2. Reduced the manufacturing cost

ITD:

IAD: 20th Nov 2025

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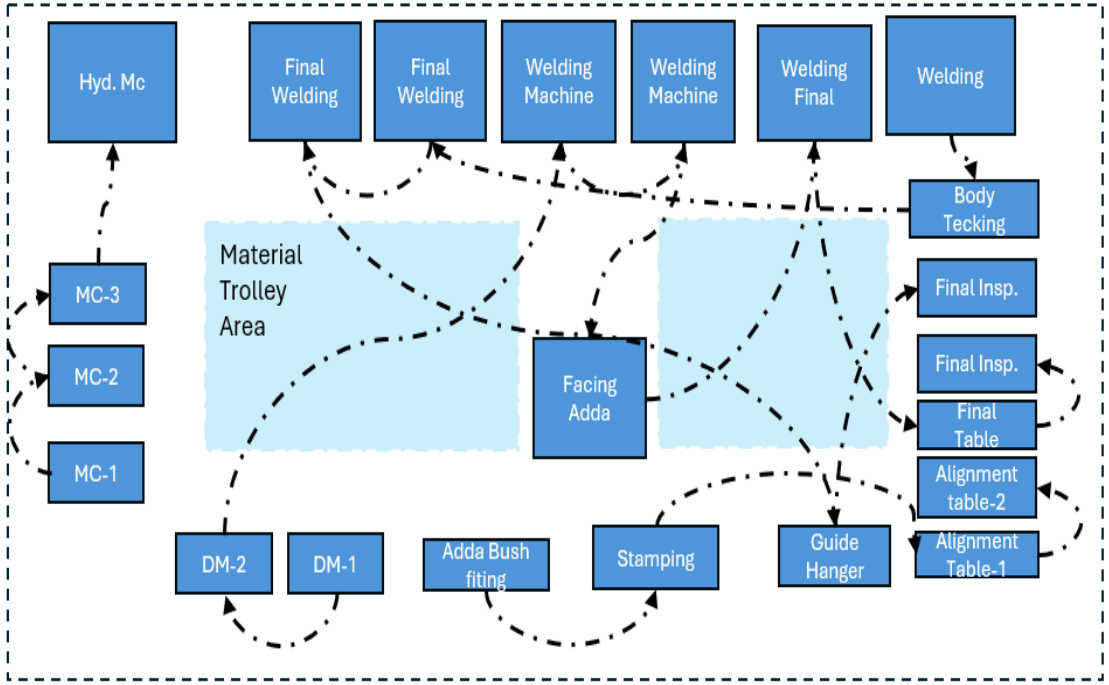
Kaizen

Expected Annual Benefits

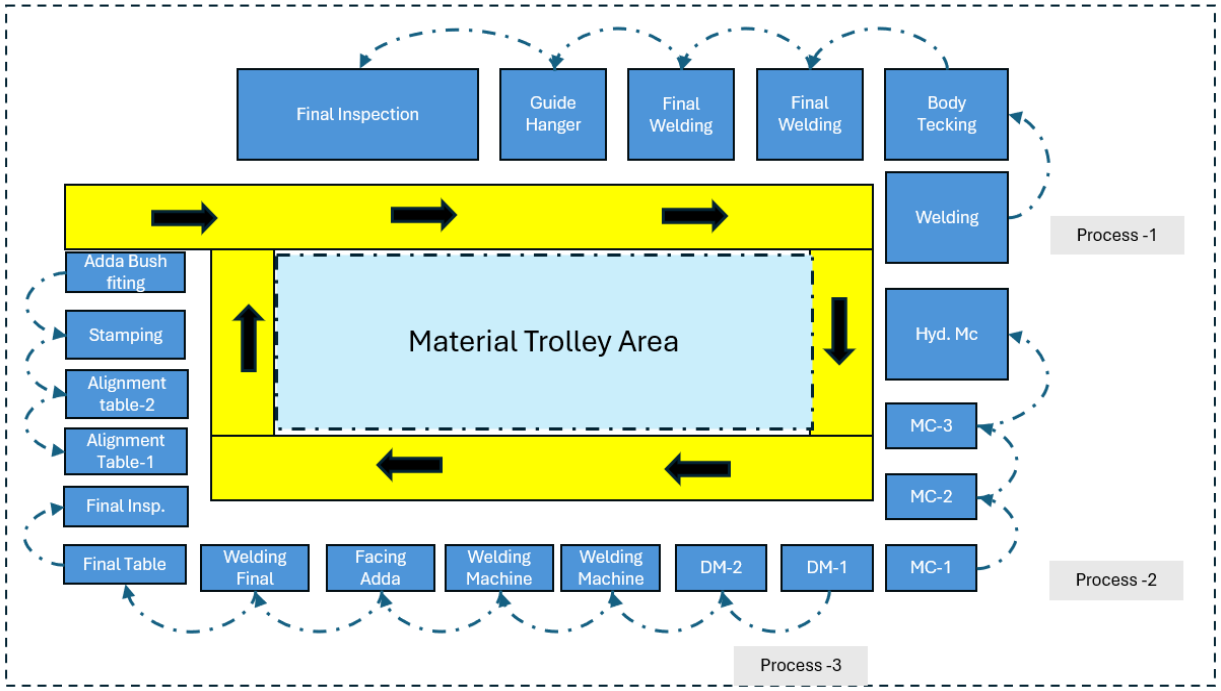
Rs. 40258

Fork product Area

Current State



Improved State



Observation

1. Fork Shop Product area Gangway not defined
2. Zig-Zag material flow

Recommendation

1. Define gangway
2. Streamline the material flow as per process

Impact

1. Space utilization
2. Time save from material movement – 3hr/day
3. Time cost – 3 * 26 = 78 hr, (43 Rs/hr)

78 * 43 = 3354 / Month

ITD:

IAD: 26th Dec 2025

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Few Key Opportunities

Plating Area

Kaizen

Expected Annual Benefits

Refer "*Comparison Sheet*" *in project report*

Current State



Improved State



Observation

Part: GROZ PIPE
No. of Hanger in Flight bar: 4
No. of pcs per Hanger: 20
No. of pcs in Flight bar: 80
Loading Area per Flight bar : **36**

Improvement

Hanger design change
No. of Hanger in Flight bar: 9 nos. plan
No. of pcs per Hanger: 12
No. of pcs in Flight bar: 108
Loading Area per Flight bar : **48.6**

Impact

Loading area per flight bar increased 12.6 sqft

ITD:

IAD: Nov 2025

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Thank You



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