

A photograph showing four professionals in an office environment. A woman in a red floral top is on the left, looking up. In the center, a man with a beard and a grey t-shirt is speaking while holding a white tablet. To his right, a woman with glasses and a white blouse is looking down at a document. On the far right, another man in a light-colored shirt is also looking down at a document. They appear to be in a collaborative meeting or presentation.

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BrAINWARS 2025 ROUND 1 SUBMISSION

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<Rahul Jha>

<Varun Gupta>

<Raj Awasthi>

<Himanshu Kumar Jha>



COGS & Overhead Summary: Assessing manufacturing expenses across Pune, Chennai, and Gurugram to determine the optimal plant location for 2027.

COGS Analysis

Costhead



CAPEX equals Chennai at **INR 50B**.
Raw materials cost **INR 430K** per car.



Labor cost approximates **INR 18K** per car.
HR & admin costs about **INR 150K** per car



Logistics stand at **INR 110K** per car.



Inventory turnover occurs **three times** per month.
Carrying cost stands at **15%** of inventory value.

Pune

CAPEX stands at **INR 50B**, 25% above Gurugram.
Raw materials cost **INR 420K** per car.

Labor Cost: **INR 15K** per car
HR & Admin: **INR 180K** per car

Logistics costs remain **INR 130K** per car.

Inventory turnover happens **twice monthly** (every 15 days).
Carrying cost is **12%**, 3% lower than Pune.

Chennai

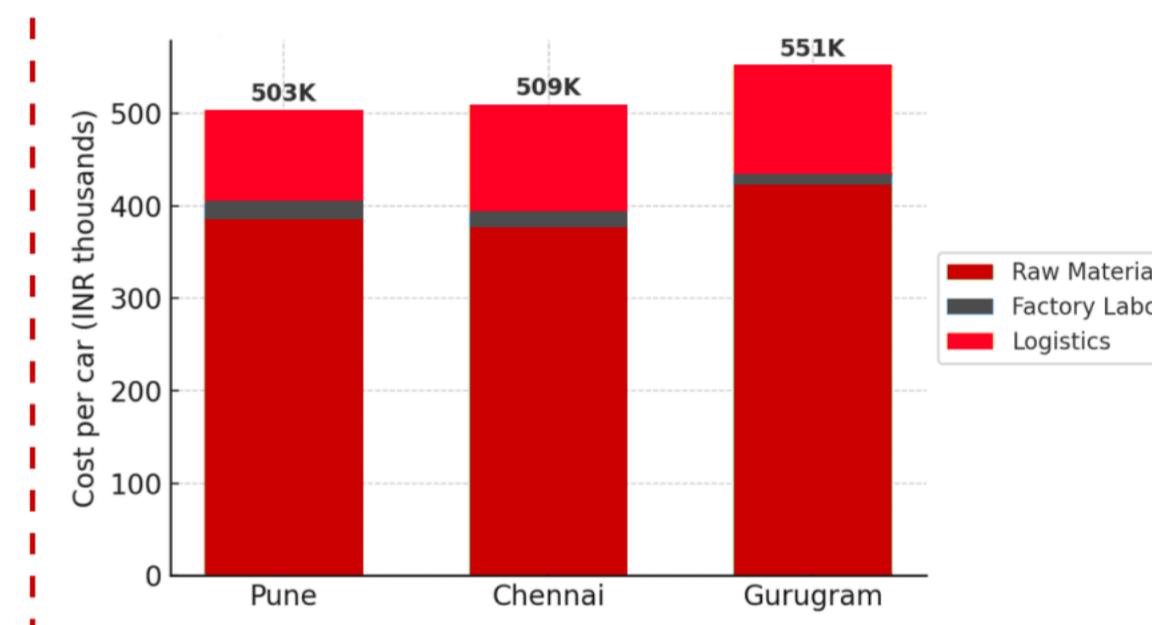
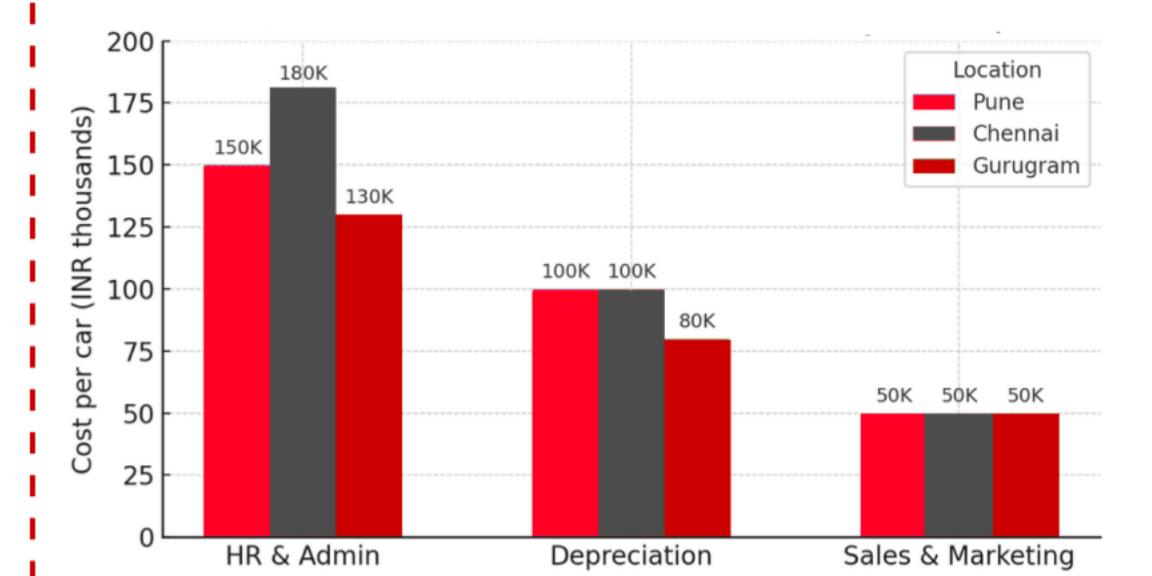
CAPEX is **25% lower** than Chennai, near **INR 40B**.
Raw materials cost **INR 470K** per car.

Labor Cost: ~**INR 12K** per car (**6K** cheaper than Pune)
HR & Admin: ~**25% less** than Pune (~**INR 112–115K** per car)

Logistics cost equals Chennai at **INR 130K** per car.

Inventory turnover occurs every **five days** (~**6 times monthly**).
Carrying cost stands at **10%** of inventory value.

Gurugram



Overhead Analysis

HR & Admin

Chennai's HR expense stands at around ₹180K per car, roughly 20% higher than Pune's ₹150K. Gurugram, at about ₹130K per car, offers the lowest HR overhead among the three locations.

Supply Chain Overhead

Distribution costs (₹110–130K per car) are already captured in the COGS, so there are no further overhead charges beyond these logistics expenses.

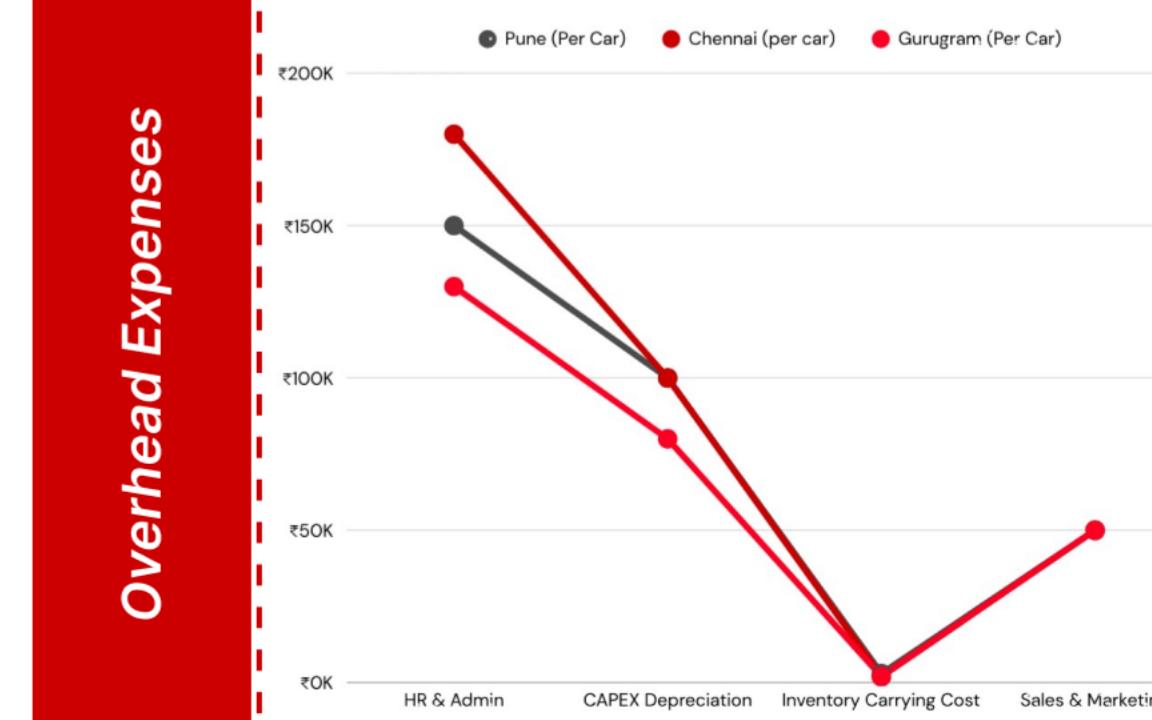
Inventory Carrying Cost

Gurugram replenishes inventory every 5 days at a 10% holding cost (resulting in around ₹2K per car), Pune turns over slower at 3 cycles per month with a 15% rate (about ₹3K per car), and Chennai sits in between at 2 cycles every 15 days and 12% holding cost (~₹2K per car).

Sales & Marketing (S&M)

A uniform expense of ₹50K per car applies to all locations, totaling ₹2.5B for 50,000 vehicles.

Overhead Expenses



Location Efficiency Hypothesis: Evaluated the ideal production facility setup to maximize cost efficiency, encompassing fixed, variable, and inventory carrying cost

Key Parameters		Pune	Chennai	Gurugram
Icon	Description	Icon	Icon	Icon
	Fixed cost (CAPEX, Setup)			
	Raw Material Cost			
	Factory Labor			
	Logistics (Distribution)			
	Inventory Carrying Cost			
Fixed Cost		Competitive Operating Costs	Economical Skilled Labor	Efficient Inventory Management
		Chennai has the lowest fixed cost among the three. Reason: It offers competitive land lease rates reducing setup costs. Cost of living is generally below Pune and Gurugram standards.	Chennai enjoys the lowest direct labor cost. Reason: Tamil Nadu's manufacturing wages are competitive - workers demand lower wage rates owing to its low cost of living.	Chennai's location and supplier network allow for the fastest inventory turnover. Reason: Proximity to suppliers means parts arrive just in time with shorter lead times.
Raw Material Cost		Cheaper Production Cost	Efficient Supply Lines	Chennai is able to maintain the leanest safety stock. Reason: Chennai boasts of on-demand supplier availability and well developed logistics in the region.
		Chennai has an edge in raw materials and component cost. Reason: Being a port city, Chennai allows cheaper import of EV components and also have a well established automotive supply chain cluster.	Pune has a clear advantage in outbound logistics for PAN India distribution. Reason: Pune's central west location ensures that it is relatively close to the large western market and not too far from North India.	We assume a similar holding cost % for all locations (10-15% inventory value per year)
Pune		Pune has certain logistical advantages and a solid supplier base, making it a viable alternative if non cost factors came into play. Pune has a strong supply chain and has a decent inventory cycle.	After weighing all costs factors, Chennai emerges as the most cost efficient location owing to its efficient supply chain, competitive fixed and operating costs and lowest total overall cost.	Gurugram falls behind on cost grounds significantly due to its higher land, labor, and logistics cost making it the least favorable purely from a cost efficiency perspective. Gurugram also has the slowest turnover.

Procurement Synergy Hypothesis: Assessed potential cost reductions and supply chain advantages post AutoAI acquisition.

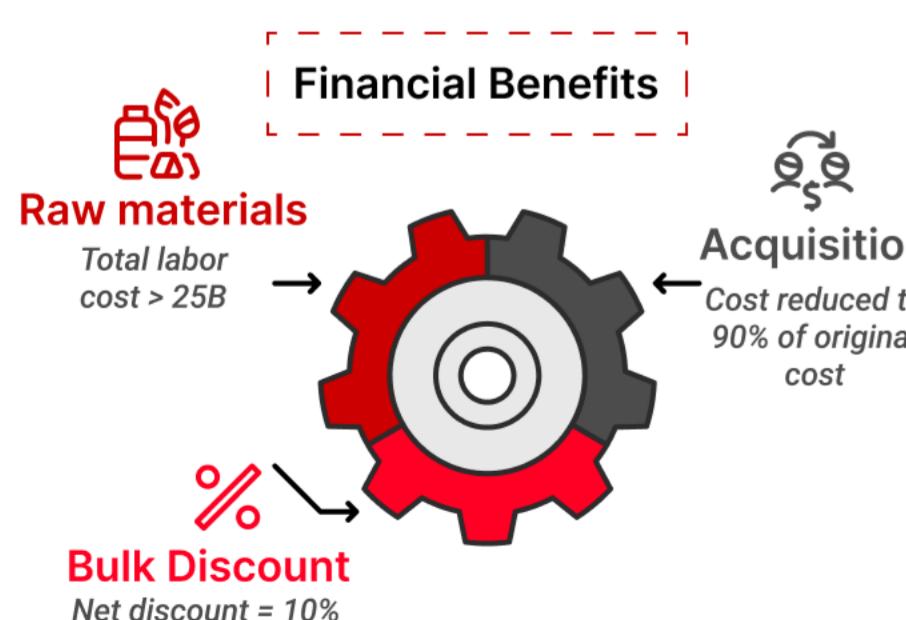
Subheading and Description

Volume Discounts & Lower Unit Costs

Discounts on Raw materials

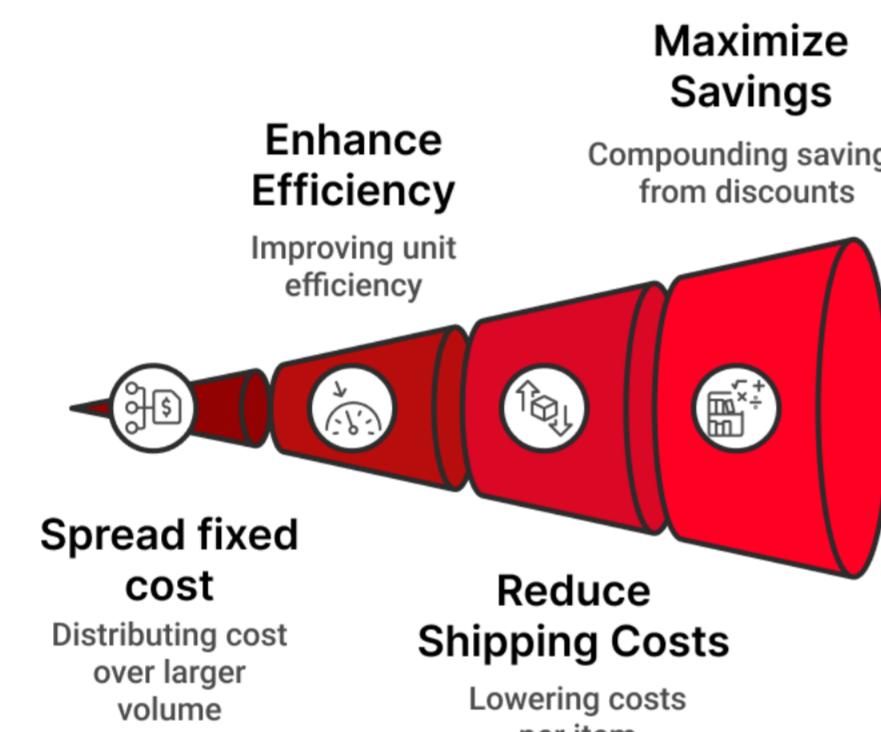


After acquiring AutoAI, the **combined raw material spend** of Nexus + AutoAI is expected to surpass this **₹25B threshold**, unlocking a **10% bulk discount** on raw materials procurement



Economies of Scale

Reduced Operational costs



The combined operation warehouse operations, procurement staff, and distribution networks become **more efficient per unit** thus **compounding the savings from formal discounts**.

Improved Supplier Negotiation & Access

Diversification and Increased Bargaining power



Bigger Orders, Better Deals:
Combining purchase volumes means suppliers offer better prices, favorable payment terms, and priority service.



More Leverage:
As a larger customer, Nexus can negotiate for faster delivery and higher quality standards.



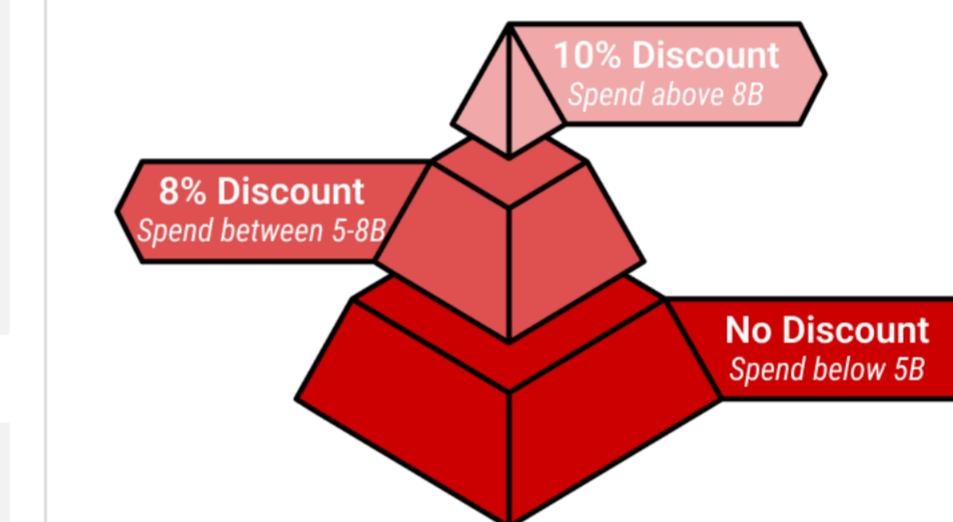
Wider Network:
Access to AutoAI's supplier base provides more options for cost-effective and high-quality materials, reducing supply risks.



Stronger Partnerships:
Building long-term relationships with suppliers secures better terms now and opens doors for future collaboration and innovation.

Consolidated Logistics & Operations

Structured Discount for logistics



Combined Logistics

With the acquisition, the combined logistics spend is expected to exceed ₹8B annually, qualifying Nexus for the maximum 10% discount on logistics. Given AutoAI's ₹3.5B and Nexus's own logistics costs, the total will likely cross the ₹8B mark, unlocking the full 10% savings.



Combined Logistics

Higher shipping volumes enable Nexus to optimize routes and load capacities, lowering the **per-unit logistics cost**. Procurement processes and systems can be unified, reducing **administrative overhead** and improving coordination with vendors.

Overall Cost Efficiency Gains

Improved Operational Profit Margin



A 5% discount on factory labor yields more modest (but still valuable) savings. On AutoAI's ₹500M labor spend, 5% is ₹25 million saved per year



the total labor savings should comfortably exceed ₹50-75 million annually (depending on Nexus's base spend), all directly improving the bottom line.
the cost synergies in procurement complement other strategic benefits of acquiring AutoAI, making the combined entity more financially robust.

Financial Benefits of Acquisition

Strengthening competitive position

Enhances strategic advantage despite lower cost efficiency.

Reinvesting in R&D

Maximizes cost efficiency by reinvesting savings into innovation.

Initial integration challenges

Faces hurdles in achieving cost efficiency and strategic gains.

Passing savings to customers

Enhances cost efficiency by offering savings to customers.

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Appendix

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Appendix 1 : Assumptions

Production Volume: We have assumed all sites to make ~60,000 cars in 2027 with a volume growth of ~5% annually. Higher volumes tend to lower fixed cost per car (economies of scale). We have made similar ramp-up at all facilities for the sake of fair comparison.

Cost Inputs (2027): The fixed costs comprise depreciation, utilities, and overhead (e.g., Pune ₹150 Cr, Chennai ₹160 Cr, Gurugram ₹180 Cr). Variable cost per car (materials, labor) was assumed lowest for Chennai (₹0.075 Cr) vs Pune (₹0.08 Cr) and Gurugram (₹0.085 Cr), reflecting differences in supplier pricing and labor/logistics costs. Inventory carrying cost is based on holding ~1–2 months of inventory, with an annual carrying rate ~10–15%. Chennai's superior logistics allow a lower inventory level (₹50 Cr vs Pune ₹80 Cr, Gurugram ₹120 Cr in 2027).

Inflation & Efficiency: We added ~4% annual inflation to costs. AutoAI procurement synergies and volume discounts, however, were assumed to negate this, particularly in Chennai. Actual net cost increase rates employed: Chennai ~0%, Pune ~2%, Gurugram ~3% annually. This indicates Chennai utilizing technology and locational efficiencies to maintain flat costs, while Pune and Gurugram experience net increases.

AutoAI Procurement Synergy: AutoAI is presumed to optimize the supply chain, resulting in bulk purchase discounts and just-in-time inventory management. By 2030, Nexus Motors achieves ~5–10% cost savings on parts purchases and a noteworthy reduction in inventory requirements. Our estimates capture these savings (more aggressively for Chennai, able to maximize them due to its infrastructure).

Production Volume: All sites presumed to make ~60,000 vehicles in 2027, with volume growth of ~5% annually. Larger volumes tend to decrease fixed cost per vehicle (economies of scale). We presumed identical ramp-up across all facilities for an equitable comparison.

Cost Inputs (2027): Fixed costs are depreciation, utilities, and overhead (e.g. Pune ₹150 Cr, Chennai ₹160 Cr, Gurugram ₹180 Cr). Variable cost per vehicle (materials, labor) is taken lowest for Chennai (₹0.075 Cr) compared to Pune (₹0.08 Cr) and Gurugram (₹0.085 Cr), taking into consideration differences in the pricing of suppliers and labor/logistics expenses. Carrying cost of inventory is estimated based on holding ~1–2 months of inventory with an annual carrying rate ~10–15%. The better logistics in Chennai enable lower inventory (₹50 Cr compared to Pune ₹80 Cr, Gurugram ₹120 Cr in 2027).

Inflation & Efficiency: We utilized ~4% per annum inflation on expenses. AutoAI procurement synergies and volume discounts, however, were assumed to cancel this out, particularly in Chennai. Net cost increase rates applied effectively: Chennai ~0%, Pune ~2%, Gurugram ~3% annually. This captures Chennai using technology and location efficiencies to maintain flat costs, while Pune and Gurugram experience net increases.

AutoAI Procurement Synergy: AutoAI is supposed to optimize the supply chain, providing bulk discounts and just-in-time inventory control. By 2030, Nexus Motors achieves ~5–10% savings on parts purchases and a large reduction in inventory requirements. Our estimates include these savings (more aggressively for Chennai, which has the ability to leverage them since it has infrastructure).

Appendix 2 : Calculation of COGS and other associated overhead expenses for the three shortlisted locations in 2027

COGS ANALYSIS						
Cost Head	Pune (Per Car)	Pune (50K Cars)	Chennai (per car)	Chennai (50K cars)	Gurugram (Per Car)	Gurugram (50K Cars)
Raw Materials	₹430K	₹21.50B	₹420K	₹21.00B	₹470K	₹23.50B
Factory Labor	₹18K	₹0.90B	₹15K	₹0.75B	₹12K	₹0.60B
Logistics (Distribution)	₹110K	₹5.50B	₹130K	₹6.50B	₹130K	₹6.50B
Procurement Discount	-₹55K	-₹2.75B	-₹55.8K	-₹2.79B	-₹60.6K	-₹3.03B
Net COGS (After Discount)	₹503K	₹25.16B	₹509K	₹25.46B	₹551K	₹27.57B

OVERHEAD USES						
Cost Head	Pune (Per Car)	Pune (50K Cars)	Chennai (per car)	Chennai (50K cars)	Gurugram (Per Car)	Gurugram (50K Cars)
HR & Admin	₹150K	₹7.50B	₹180K	₹9.00B	₹130K	₹6.50B
CAPEX Depreciation	₹100K	₹5.00B	₹100K	₹5.00B	₹80K	₹4.00B
Inventory Carrying Cost	₹3K	₹0.16B	₹2K	₹0.12B	₹2K	₹0.10B
Sales & Marketing	₹50K	₹2.50B	₹50K	₹2.50B	₹50K	₹2.50B
Total Cost per Car	₹806K	₹40.32B	₹841K	₹42.58B	₹813K	₹40.67B

Appendix 3 : Detailed comparison across the three locations based on fixed and behavioral factors

HIGH LEVEL COSTT COMPARISON ACROSS POTENTIAL PRODUCTION FACILITIES			
Parameter	Chennai (TN)	Pune (MH)	Gurugram (HR)
Raw Material Cost (Per Car)	420,000	420,000 (assumed similar to Chennai)	470,000 (50K higher than Chennai)
Factory Labor (Per Car)	15,000	18,000 (derived from 216,000 for 12 cars)	9,000 (6K lower than Chennai)
Logistics Cost (Per Car)	130,000	130,000 (assumed same as Chennai)	130,000 (as provided for Chennai/Gurugram)
Total Variable Cost (Per Car)	565,000 (420K + 15K + 130K)	568,000 (420K + 18K + 130K, estimated)	609,000 (470K + 9K + 130K)
HR/Admin Cost (Annual, Per Role)	180,000	90,000 (50% lower than Chennai)	150,000 (guesstimated for Tier-1 location)
Inventory Carrying Cost (Per Car/Year)	~5,000 (assuming 10-day safety stock & 10% cost)	~5,000 (assumed similar to Chennai)	~3,000 (shorter, 5-day replenishment cycle)
Initial CAPEX / Plant Setup	50B INR (for ~100K cars/month capacity)	5B INR (scaled down for ~10K cars/month capacity)	25B INR (estimated for a moderate capacity, ~50K cars/month)
Expansion/Overhead Costs	50K INR over 10 years per production increase	110K INR/year for expansion	50K INR over 10 years per production increase (assumed)
Additional Notes	Eligible for 10% raw material discount if spend >28B INR	Same discount applies if thresholds are met	Discount applies, lower inventory cost may offset higher raw material cost