RESEARCH PAPER & INDUSTRY MANIFESTO

Authored by Hidral S.A. (Spain) in partnership with Gilco Global (India)

VERTICAL INTEGRITY.

Quality, Safety, and the Coming Decade of the Indian Elevator Industry.

An evidence-based examination of why India's elevator sector must shift the procurement conversation from price to quality and safety — and a manifesto for how to do it.

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A U T H O R

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A B S T R A C T

Abstract.

India is on track to become the world's largest elevator market within the next decade. As of 2024 it is already the second-largest by annual installations, behind only China, with the market valued at USD 4.10 billion and projected to reach USD 7.12 billion by 2030 at a 9.47% compound annual growth rate (TechSci Research, 2025). This expansion is occurring in parallel with — and partly because of — the most consequential regulatory change in the country's elevator history: the mandatory adoption of IS 17900 from 22 December 2025, which aligns Indian safety standards with ISO 8100-1:2019 and the European EN 81-20 / EN 81-50 norms (Bureau of Indian Standards, 2022; Business Standard, 2025).

Yet the same period that frames the commercial opportunity also frames a documented public-safety problem. Indian elevator-related fatalities are widely estimated at 50 or more per year, with the rate having approximately doubled between 2010 and 2022 (Citizen Matters Mumbai, 2023; industry compilations). In Hyderabad alone, between August 2024 and March 2025, public reporting documented at least five fatal or serious lift incidents — including the deaths of two children in separate entrapment incidents — attributable, in the assessments of Indian engineering professionals quoted in the trade press, to substandard components, falsified compliance, and inadequate maintenance (Telangana Today, via Elevator World, 2026; The Times of India, 2025).

This paper makes three connected arguments. First, that the dominant procurement frame for elevators in India today — lowest-bidder competition on upfront equipment price — is misaligned with the actual cost structure of vertical infrastructure over a 20-year operating life, and produces measurable harm. Second, that four structural forces (the IS 17900 regulatory shift; rising real per-capita incomes; the demographic ageing of the urban population; and architectural pressure on finite urban land) have converged to make a quality-led repositioning commercially viable in segments where it previously was not. Third, that the industry — manufacturers, installers, developers, regulators, financiers and the technical press alike — has a five- to ten-year window in which to lead this repositioning rather than be reshaped by it.

The paper concludes with a seven-principle manifesto, written in a form designed to be adopted individually by any single firm or institution and, where possible, collectively by industry bodies. Each principle is paired with concrete next steps for seven specific actor categories. The full bibliography is

provided at the end. All quantitative claims are sourced. The paper is published openly, may be redistributed freely, and welcomes critical engagement.

Keywords

Indian elevator industry, IS 17900, vertical mobility, lift safety, EN 81-20, ISO 8100, total cost of ownership, urban infrastructure, procurement reform, BIS, Hyderabad lift accidents, Gilco Global, Hidral, Orona.

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ABOUT THIS DOCUMENT

This paper is jointly authored and published by Hidral S.A., a Spanish elevator manufacturer founded in Seville in 1975, and Gilco Global, an Indian vertical-mobility company founded in 2014 and the Indian arm of Spain's Orona Group. The two firms have complementary positions in the Indian market: Gilco Global operates as the on-the-ground Indian principal, with offices across nine Indian cities and a multi-year commercial track record under the EN 81 framework through its Orona partnership; Hidral is in the early stages of building its Indian presence, contributing engineering depth in heavy-load platforms, car lifts, freight elevators, and special-purpose lifting where standard catalogue products do not reach.

The paper is intended for elevator engineers, manufacturers, installers, real-estate developers, architects, building owners and resident welfare associations, state and central regulators, BIS technical committee members, insurance underwriters, journalists, and policy researchers. Its argument is structural, not commercial. It is published as a contribution to the public conversation on Indian elevator safety; it may be redistributed, quoted, translated, and cited freely without permission. Disagreements and corrections are welcomed and will be addressed in future revisions.

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FRONT MATTER

Methodology, scope, and disclosures.

Methodology

This paper is a synthesis-and-position document, not original empirical research. Quantitative claims are drawn from public sources cited in the bibliography, including: official Indian governmental and regulatory publications (Bureau of Indian Standards, Ministry of Housing and Urban Affairs, NITI Aayog, state Lifts Acts), peer-reviewed academic and industry research (TechSci Research, Mordor Intelligence, IBEF, Grand View Research), Indian and international financial press (Business Standard, The Hindu, Times of India, Mint, Reuters), trade publications (Elevator World, Elevator World India, MGS Architecture, Construction Times), and primary statistical sources (World Bank, IMF, UN Population Division, UN-Habitat).

Where multiple sources offer divergent estimates of the same quantity — for example, the size of the Indian elevator market, where reputable industry research firms produce values ranging from approximately USD 1.6 billion to USD 14.6 billion depending on methodology and product scope — the paper cites the most conservative value of the most directly relevant scope, names the source, and acknowledges the range. Where a figure is contested or known to be undercounted, the paper says so explicitly. Interpretative claims are framed as the authors' position and labelled as such.

Every quantitative claim in the body of the paper carries either an inline citation [number] keyed to the bibliography or a 'Source:' attribution beneath the relevant figure or table. Readers are encouraged to verify any claim that materially affects their decisions; the bibliography provides the URLs or document references needed to do so.

Scope

The paper concentrates on India's passenger and goods passenger elevator market, with secondary attention to car lifts, heavy-load freight platforms, and home lifts where these are commercially or thematically relevant. Escalators and moving walkways are largely outside scope. The geographic focus is India; international comparisons (United Kingdom, United States, Japan, China) are introduced only where they meaningfully illuminate the Indian situation, and are sourced from the originating jurisdictions wherever possible.

The temporal frame is the period from approximately 2014 to 2030. The paper does not attempt long-range demographic forecasting beyond what is contained in published projections from official statistical bodies.

Disclosures and conflicts of interest

The corresponding author is an employee of Hidral S.A., a Spanish elevator manufacturer with commercial interests in the Indian market. Hidral is in the early stages of establishing its Indian operations; at the time of writing, the company has no material installed base in India. Gilco Global, the co-publishing partner, is the Indian arm of Orona Group (Spain) and operates in nine Indian cities under the EN 81 framework. Both firms benefit, in principle, from a market shift toward IS 17900 compliance, total-cost-of-ownership procurement, and quality-led competition. This commercial alignment is disclosed openly, and readers should weigh the paper's arguments accordingly. The factual claims, however, are independently sourced and independently verifiable.

The paper does not name specific competitor companies in adverse terms. The patterns it describes — substandard components, falsified compliance certificates, opportunistic procurement — exist as a documented sectoral phenomenon in India (see Chapter 5), reported by Indian engineers in the Indian trade press; the paper does not attribute them to any individual firm. Where individual firms are named in positive terms (KONE India in Chapter 7, for example), the citation is to a public statement made by a named officer of that firm in a named publication.

On the limits of this document

The authors are practitioners, not academic researchers. The paper is a structured intervention in an industry conversation, not a peer-reviewed scholarly contribution. Readers seeking exhaustive technical specification of IS 17900 are directed to the standard itself (BIS, 2022, Parts 1–2). Readers seeking comprehensive elevator industry market data are directed to the published reports of TechSci Research, Mordor Intelligence, and IBEF. Readers seeking peer-reviewed evidence on consumer-product 'localised degradation' patterns are directed to the journalism and academic literature cited in Chapter 5; the authors do not claim to advance new empirical findings on that topic.

Where the paper makes recommendations — particularly in Parts Two and Three — the recommendations are presented as the authors' position, supported by the evidence cited but not entailed by it. Other reasonable analyses of the same evidence may reach different conclusions. The conversation that this paper hopes to start is more important than any single position taken inside it.

AN INVITATION FOR CRITICAL ENGAGEMENT

If a number, a quotation, or an interpretation in this paper is wrong, the authors want to know. Corrections received in writing will be acknowledged in subsequent editions. The corresponding author's contact details are provided in the back matter.

PART ONE

The market context: India's compressed building boom.

Why the scale and speed of Indian construction structurally elevates the stakes of how its elevators are built.

India is in the middle of an infrastructure expansion of historically unusual scale and historically unusual speed. The two characteristics are connected. The volume of construction now in progress is the consequence of a long-deferred urbanisation; the speed at which that construction is occurring is the consequence of compressing into a single decade what comparable transitions in other large economies have taken thirty years or more to complete. Both characteristics matter for elevator policy, and both shape the safety case set out later in this paper.

The investment numbers

The Indian elevator market generated approximately USD 4.10 billion in revenue in 2024 and is projected to reach USD 7.12 billion by 2030, growing at a compound annual rate of 9.47%, according to TechSci Research[1]. Comparable estimates from Mordor Intelligence and IBEF fall within a range that broadly converges on this trajectory[2]. The wider Indian elevator and escalator market — which includes escalators, moving walkways, modernisation, and aftermarket services — is several multiples larger; IMARC Group estimates USD 14.6 billion in 2024[3].

These figures are downstream effects of a much larger infrastructure programme. India's National Infrastructure Pipeline — the central government's framework for sectoral capital expenditure — committed approximately USD 1.4 trillion of investment for the period through FY 2025 (Ministry of Finance, Government of India). The Smart Cities Mission, launched in 2015, targets 100 cities for comprehensive infrastructure upgrade. The Pradhan Mantri Awas Yojana sets housing targets in the tens of millions of units. Each of these programmes generates downstream demand for vertical-transportation systems on a multi-decade horizon.

USD 7.12 B

Projected Indian elevator market revenue by 2030

TechSci Research (2025); 9.47% CAGR from USD 4.10 B in 2024

The urbanisation trajectory

The structural force underneath the construction figures is one of the largest urbanisation events of the twenty-first century. India's urban population is projected to reach approximately 50% of the total population by 2050 — equivalent to roughly 877 million urban residents, up from approximately 461 million in 2018[4]. This is consistent with NITI Aayog's earlier projections[5] and with the United Nations Population Division's World Urbanization Prospects[6].

To grasp the scale of the transition, it is useful to compare with the Chinese precedent. China went from 17% urban in 1978 to approximately 64% urban in 2023, adding roughly 600 million urban residents over forty-five years (United Nations data). India is projected to add a comparable absolute number of urban residents — on the order of 400 to 500 million between 2018 and 2050 — over a period roughly two-thirds as long. The implication for vertical transportation demand is direct: every additional urban resident is, eventually, an elevator user, in a multi-storey residence, workplace, hospital, school, or commercial complex.

USD 4.10 B	~50%	~877 M
Indian elevator market revenue, 2024	Projected urbanisation by 2050	Urban Indians projected by 2050

Source: TechSci Research (2025); UN-Habitat / Coalition for Urban Transitions analysis (2021); UN World Urbanization Prospects.

India as the world's #2 elevator market

India is, as of 2024, the second-largest elevator market in the world by annual installations, behind only China. This is no longer a forecast; it is a documented position. The India Brand Equity Foundation (IBEF), the trade and investment promotion body, identifies the position explicitly[7]. The Managing Director of

KONE India, Amit Gossain, has noted that India is now the second-largest market for KONE worldwide, after China — a corporate confirmation of the same ordering[8].

Estimates of annual installation volumes vary by source and by inclusion criteria. Industry research firms place the Indian market in a range of approximately 100,000 to 150,000 units annually, with some sectoral analyses extending toward 250,000 units when informal, unregistered, and rural installations are counted. The range itself is informative: it reflects both the real scale of the opportunity and the genuine challenge of statistical visibility in a sector where installation occurs across a fragmented contractor base, large parts of which are not subject to consolidated regulatory tracking.

More important than the absolute volume is the trajectory differential between India and China. The Chinese elevator market — the world's largest, at approximately 700,000 to 800,000 units annually in recent years — has flattened markedly, growing at low single-digit annual rates and contracting in some quarters. The Indian market is growing in high single digits to low double digits annually. By the early 2030s, on current trajectories, India's annual installation volumes may approach or exceed China's. This is not a guaranteed outcome; it is a credible one.

Why compression matters for safety

In a thirty-year construction cycle, the immaturities of a regulatory and quality-control system have time to be detected, debated, and corrected. The first generation of buildings reveals failure modes; the second incorporates lessons; the third is materially safer. Codes evolve. Inspectors are trained. Specifications converge. Industry norms eventually harden into law. The construction boom of the United States from 1950 to 1980 is the archetypal example of a generationally paced expansion; the post-war reconstruction of Western Europe is another.

In a ten-year cycle, those iterations do not happen at the same pace. Failures discovered in 2026 may not influence the codes governing the next wave of installations in 2028 simply because too much new floor space is being commissioned simultaneously for the standard-setting process to keep up. This is not a criticism of any particular Indian institution. It is a structural observation: regulatory maturity is a function of time-and-volume, not of effort alone, and India is attempting in a single decade what no comparable economy has attempted at this scale in this timeframe.

This is the structural backdrop against which every other argument in this paper sits. India is not building unsafely because Indian engineers are inferior to European engineers — they are not. India is not building unsafely because Indian developers are uniquely venal — they are not. India is building under unique pressure: pressure under which substandard practice can scale faster than the corrective mechanisms

designed to detect and contain it. The thesis of this paper is that the industry itself, operating ahead of pure regulatory enforcement, can compress that gap.

> **THE COMPRESSION PROBLEM**
>
> India is compressing roughly thirty years of regulatory and quality-control maturation into approximately ten years of commissioned construction. The pipeline is committed, the construction is in progress. The question is whether the safety, certification, and accountability systems are in place in time — or whether they arrive in retrospect, in the form of inquests.

PART TWO

The category error: the elevator is not a feature.

On why a building's vertical-transportation system is not a procurement line item, and what follows when it is treated as one.

Most procurement processes for elevators in Indian construction projects evaluate competing vendor proposals primarily, sometimes exclusively, on a single dimension: upfront equipment price. This is the dominant frame. It is also a mistake. The argument of this chapter is that the elevator is not, conceptually, a procurement line item comparable to flooring, paint, or interior fixtures. It is the system without which the building, as designed and as priced, does not function. Treating it as a commodity item to be price-shopped is a category error, and the consequences of that error compound over the building's operating life.

A direct question

The intuitive answer is: substantially less than the same apartment with a working elevator. The more precise answer is: in many cases, less than zero. A property that cannot fulfil the basic function it was constructed to serve becomes a maintenance burden, a legal exposure, and an asset that depreciates faster than the floors below it.

The Mumbai floor-rise data

Indian real-estate markets price the elevator's economic contribution explicitly. Floor-rise charges — the per-square-foot premium that developers add to the base price of an apartment for each additional floor — typically range from ₹25 to ₹100 per square foot per floor in Mumbai, depending on locality, view, and project tier[9]. For a high-rise apartment in 2026, the cumulative floor-rise premium can add ₹5 lakh to ₹20 lakh to the purchase price[10]. Higher floors in Mumbai high-rises sell with cumulative price premia of approximately 5% to 25% over equivalent lower-floor units, depending on view, location, and amenity quality[11].

In premium South Mumbai locations such as Malabar Hill, Worli, and parts of Bandra West, square-foot rates can reach ₹1.2 lakh per square foot for sea-facing apartments, with prices in the broader premium tier between approximately ₹35,000 and ₹80,000 per square foot. The economic premium for a higher-

floor apartment in such a location is therefore not a marginal effect; it can amount to several crore rupees on a single unit. The premium is paid because the assumption — embedded in the price — is that the elevator works.

The 30 stories minus 1 elevator equation

Consider a hypothetical 30-storey luxury residential tower with a single working elevator that fails permanently. The square-footage above approximately the second floor remains physically intact; the views, finishes, and structural quality are unaltered. But the assumption of ready vertical access — on which the floor-rise premium was paid — has collapsed. In the absence of that access, the units above the second floor become substantially harder to sell, harder to lease, and harder to occupy. Premiums evaporate. The price differential between a thirtieth-floor unit and a ground-floor unit, previously positive in favour of the thirtieth, can invert in sign.

Roughly 90%

Asset-value depreciation when a 30-storey tower's only elevator stops working, relative to the same tower with the elevator operational

Authors' analytical synthesis based on Mumbai floor-rise charge data and high-rise apartment premium structure

This is an analytical illustration, not an empirical measurement; the actual loss in any specific case will depend on the alternative-access design of the building, the regulatory and contractual response of the housing society, and the local re-sale market. But the direction of the effect is robust, and the order of magnitude is supported by the floor-rise premium data: when the system that justifies the premium fails, the premium is lost. What looks like a 2% to 12% line-item in construction-cost terms is, on the asset-value axis, closer to the condition under which the rest of the asset's value subsists.

The procurement category error

If the elevator's economic contribution to the asset is closer to 'condition of value' than to 'feature of the building', the procurement frame must follow. A line-item comparable to flooring or paint can be sensibly tendered to the lowest qualified bidder; a line-item comparable to the structural foundation cannot. Nobody seriously suggests evaluating reinforced concrete on price-per-cubic-metre alone, ignoring tensile strength, certification, and supplier track record. The argument of this paper is that vertical-transportation

systems sit closer to the second category than to the first, and that current Indian procurement practice in many segments has the categorisation wrong.

The implication is not that elevator price should be ignored. Price always matters. The implication is that price alone is an incomplete metric for a piece of safety-critical infrastructure with a service life of two decades or more. Total cost of ownership, regulatory compliance, supplier track record, and component traceability belong inside the evaluation framework, not outside it. Chapter 9 develops this argument in concrete TCO terms; Chapter 10 proposes the procurement-language reforms that would put it into practice.

> **THE CENTRAL THESIS, RESTATED**
>
> The elevator is not a feature of the building. It is the condition under which all other features have value. Procurement frames that treat it as the former produce systematic under-investment in the elevator and systematic over-exposure in the asset that depends on it.

PART THREE

Budget allocation versus the true cost of failure.

Why the share of construction cost devoted to vertical transport rises with building complexity — and why the same segments are most prone to under-specification.

Chapter 2 argued that the elevator's economic contribution is misaligned with its share of construction cost. This chapter develops the corollary: that the divergence between budget allocation and the consequences of failure is largest in exactly the building typologies where the consequences of failure are most severe. The result is a structural temptation to under-specify in the segments that can least afford it.

Four typologies, four cost-of-failure profiles

The table below summarises four representative building typologies. The construction-cost percentages are illustrative ranges drawn from sector benchmarks; the cost-of-failure descriptions are categorised by the dominant economic and human consequences of an inoperable lift system in each typology.

Typology	Lift % of build cost	Dominant cost of failure
Standard residential	~ 2 – 4%	Tenant inconvenience, complaint volume, marginal asset depreciation
Commercial office	~ 5 – 8%	Lease penalties, productivity losses, tenant flight
Hospital / healthcare	~ 10 – 14%	Life-safety critical: emergency-care delay, surgical-patient transfer impairment
Industrial / heavy-load	~ 6 – 12%	Production halts, supply-chain breakage, contractual penalty exposure

Source: Authors' synthesis from publicly available construction-cost benchmarks (CREDAI, FICCI Real Estate Committee) and elevator industry typology references (Elevator World India, MGS Architecture).

In standard residential — the largest segment of the Indian elevator market by unit volume — the elevator typically accounts for between 2% and 4% of construction cost. A failure produces tenant inconvenience,

complaint escalation through the housing society, and modest depreciation in unit values. The consequences are real but not catastrophic; in this segment, the procurement-on-price frame is least dangerous, though even here it is far from costless.

In commercial office, the share rises to roughly 5% to 8%, reflecting the increasing complexity of high-speed lifts, destination-dispatch control systems, and high-capacity passenger handling. The failure consequences shift toward measurable financial outcomes: lease penalty clauses, productivity losses for occupants, reputational impact on landlord and developer, and, in extreme cases, tenant flight.

In hospital and healthcare facilities, the share rises again, into a 10% to 14% band, and the nature of the failure consequence changes fundamentally. A non-functional lift in a hospital is not a productivity event; it is a clinical event. Surgical patients on stretchers cannot reach operating theatres on schedule. Emergency response times degrade. The cost of failure ceases to be denominated in rupees and begins to be denominated in patient outcomes.

In industrial and heavy-load applications — automotive logistics hubs, pharmaceutical manufacturing, distribution centres operating just-in-time supply chains — the share is roughly 6% to 12%, and the failure cost is dominated by production halts. A four-hour stoppage on a heavy-load freight elevator at a tier-one automotive supplier can trigger penalty payments to the OEM in the lakhs to crores of rupees per day. Supply-chain breakage propagates downstream.

The investment-vs-failure differential

Across these four typologies, an empirical regularity emerges that has direct procurement implications. The investment differential between a quality-grade elevator system and a substandard one — the upfront equipment-cost gap — is typically in the range of 25% to 40% of the equipment line-item, depending on the segment. The cost-of-failure differential, in segments where failure has serious downstream consequences, is on a fundamentally different scale: it is typically a multiple, in some cases an order of magnitude greater than the upfront cost differential, when summed over a 20-year operating horizon (see Chapter 9).

This is the structural source of the under-specification temptation. The investment differential is visible at the procurement stage, on the spreadsheet, immediately. The cost-of-failure differential is invisible at the procurement stage; it only manifests after commissioning, when remediation is expensive, disruptive, and often litigated. In segments where the procurement decision and the consequences of failure are decoupled in time and decoupled in organisational accountability, the result is predictable: systematic

under-specification at the stage where the saving is visible, and accumulating exposure at the stage where the saving is repaid in failure costs.

Where the under-specification temptation is strongest

It is worth being precise about where, in the Indian market, this temptation is structurally strongest. The pattern is most visible in three contexts:

- **Mid-tier residential developments.** Where the elevator is treated as a 2% line item, where the procurement officer is rarely an engineer, and where the housing society — which will absorb the maintenance and breakdown costs over twenty years — is not represented at the procurement table.
- **Hospitals operated under cost pressure.** Where the procurement decision is made by financial managers under capital-expenditure constraints, and where the clinical operators who depend on the equipment are downstream of the decision.
- **Industrial projects where the elevator is a sub-line on a turnkey contract.** Where the engineering, procurement and construction (EPC) contractor optimises for margin on the project as a whole, and where the elevator specification is delegated to a sub-tier procurement function.

In each of these contexts, the structural fix is the same: bring the parties who will bear the cost of failure into the room where the procurement decision is made. The next chapter examines what those costs look like when they are not.

> **THE PARADOX OF UNDER-SPECIFICATION**
> The segments where the elevator's cost share is largest are the same segments where the cost of failure is most severe. They are also the segments where under-specification is structurally most tempting. Reversing the temptation is a procurement-design problem, not a regulatory one — though regulation can help.

PART FOUR

The safety record the industry rarely discusses.

On Indian elevator fatalities, the international comparison, and the documented case material that the Indian engineering press has been more willing to publish than the consumer press.

This chapter presents the Indian elevator safety record as it is documented in public sources. The presentation is uncomfortable. It is also accurate. None of the data here is broken in this paper; all of it has been published previously, in Indian and international trade publications, in mainstream Indian press, and in academic and policy literature. What is unusual is consolidation in one place, with attribution and context.

The Indian baseline

India is widely estimated to record more than 50 elevator-related fatalities per year. The figure appears across multiple compilations and is treated as the working consensus in the trade press and in safety-statistics aggregations[12]. The figure is acknowledged within the industry to be an undercount: incidents in informal construction, in unregistered installations, and in rural settings are systematically less likely to be reported and aggregated.

Trend data is less consolidated than annual-rate data, but the available compilations indicate that the Indian elevator-related fatality rate has approximately doubled between 2010 and 2022 — i.e. it has increased while the comparable rates in the United Kingdom, Japan, and most of continental Europe have remained essentially flat or have declined. This is consistent with what would be expected on first principles: the Indian installed base has grown rapidly over the same period, and a substantial fraction of the new base has been installed under the IS 14665 framework, which pre-dates the now-mandatory IS 17900 safety upgrade.

On international comparison — and its limits

Comparing elevator-related fatalities across jurisdictions is harder than it appears, and any comparison should be read with three caveats. First, definitions vary: some jurisdictions count only fatalities to passengers, others include workers performing maintenance, others include construction-phase fatalities, and the boundary between elevator and escalator incidents is not drawn the same way everywhere.

Second, the installed base differs by orders of magnitude across the comparators, and per-elevator rates depend on the denominator. Third, reporting infrastructure differs: mature regulatory regimes capture more incidents than maturing ones, which can produce a paradoxical effect in which jurisdictions with better reporting appear superficially to have more incidents than jurisdictions with worse reporting.

With those caveats, the order of magnitude is clear from any of the available compilations. The United Kingdom — with an installed base of roughly 250,000 to 300,000 lifts in operation — records elevator-related fatalities in the low single digits per year. The United States records roughly 25 to 30 elevator and escalator fatalities annually across an installed base of approximately 900,000 to 1,000,000 lifts. Japan records elevator fatalities in the very low single digits annually. India's reported 50-plus annual fatalities, against an installed base widely estimated at approximately 1.5 million lifts in service, corresponds to a per-elevator fatality rate that is, by any of these compilations, materially higher than the comparators — by a factor that varies from approximately one-and-a-half times to in some single-segment estimates more than ten times, depending on the comparison and the assumed denominator.

The authors do not claim a single precise multiplier. The honest summary is that the gap is real, large, structural, and trending in the wrong direction relative to comparable jurisdictions. That is the relevant fact for industry policy in 2026.

Hyderabad: a documented case sequence, August 2024 – March 2025

To make the abstract concrete, this section reproduces a sequence of fatal and serious lift incidents documented in Hyderabad during a single eight-month period from August 2024 through March 2025. The sequence is drawn from Telangana Today's reporting, summarised internationally by Elevator World, and from independent reporting in The Times of India and the Deccan Chronicle. None of the incidents was a freak occurrence; the trade press analysis attributes the cluster to a common set of causes.

- **August 2024 —** A 65-year-old man fell to his death down an elevator shaft in Gudimalkapur, Hyderabad.
- **November 2024 —** Six people were injured when a lift plummeted from the sixth floor of an apartment building in Chandulal Baradari, Hyderabad.
- **February 2025 —** A six-year-old boy in a Hyderabad apartment building was trapped between the elevator doorframe and shaft wall on 21 February and died on 22 February of multiple organ failure (Times of India).
- **March 2025 — A second young child died in a separate elevator entrapment incident in Hyderabad.**
- **March 2025 —** A retired senior official died from injuries sustained in a separate Hyderabad elevator fall.

Five distinct fatal or serious lift incidents in a single Indian city, in eight months. The trade press analysis — including comments from VYLN Murthy, an electrical engineer who has held positions at KONE Elevators India and Otis Elevator India — attributes the cluster to substandard components installed by small, uncertified contractors, the absence of high-quality door interlocks and gate-locking systems on collapsible-door installations, and inadequate routine maintenance[13].

The shared causal pattern

The post-incident analyses in the trade press, in mainstream Indian reporting, and in academic safety literature converge on a small set of repeating causes. The list below is not exhaustive, and not every incident involves every cause; but in aggregate, the causes are well-documented and entirely preventable in technical principle:

- Cheap, substandard components installed in safety-critical positions, particularly door interlocks, brake systems, and overspeed governors.
- Maintenance contracts awarded at price points that do not permit the visit frequency, parts allowance, and technician training the installed equipment requires.
- Absence of safety features that have been mandatory in EN 81 markets for over a decade — Unintended Car Movement Protection (UCMP) and Ascending Car Overspeed Protection (ACOP) being the two most frequently cited in incident analyses.
- Installation by uncertified contractors operating without on-site engineering supervision, particularly on small residential projects.
- Falsified or missing compliance documentation for safety-critical components, frequently sourced through informal supply channels.

Each item on this list is, in principle, fixable. Some are fixable through regulation — IS 17900 directly addresses several, as Chapter 7 examines. Others are fixable through industry conduct that does not require regulatory change. The next chapter examines a structural pattern in the Indian consumer-product market that helps explain why the regulatory and industry responses have, until very recently, lagged so far behind the documented harm.

> **WHY THIS DATA MATTERS NOW**
> If the Indian installed base continues to grow at 9–10% compound annually, and if the per-elevator fatality rate does not improve, the absolute annual fatality count will rise mechanically over the next decade. Halting that arithmetic requires either substantially better new-

installation standards, substantially better installed-base modernisation, or both. IS 17900 addresses the first leg. The second leg remains largely open.

PART FIVE

On 'localised degradation' as a market failure mode.

On the difference between localisation, which is a virtue, and localised degradation, which is a documented sectoral phenomenon — and on what its existence implies for elevator procurement.

This is the most sensitive chapter in the paper, and the one most exposed to misreading. The argument is structural and is not a charge against any particular firm. The phenomenon described here exists, is documented in the academic and journalistic literature, and is relevant to elevator procurement policy. Where the argument is normative, it is labelled as such. Where the argument is empirical, it is sourced.

Localisation versus localised degradation

It is essential to draw the distinction at the start. Localisation — the engineering or design adaptation of a product to local conditions, local tastes, local infrastructure, or local regulatory environments — is an unambiguous virtue. The Maruti Suzuki Swift adapted to Indian roads, the Amul lassi adapted to Indian taste, the HDFC Bank mobile app built for Indian payment infrastructure, the Mahindra Bolero engineered for Indian driving conditions — these are textbook examples of legitimate localisation. They reflect engineering excellence applied with cultural and operational sensitivity. Indian engineering has produced world-class examples of legitimate localisation across many product categories, and continues to do so.

The phenomenon this chapter examines is different and is documented separately in the academic and investigative-journalism literature. The phenomenon is the substitution of substantively inferior product specifications under identical or near-identical brand presentation, where the price-sensitive consumer is unable to detect the substitution at the point of purchase. The phenomenon has been the subject of multiple investigative reports across consumer-product categories — packaged food, infant formula, personal-care products, pharmaceuticals, automotive components — in markets including but not limited to India, over a period of approximately two decades.

The authors of this paper do not claim to advance new empirical findings on the phenomenon as a general consumer-products issue. The literature on it is extensive, mature, and accessible to the reader who

wishes to consult it. The relevance to this paper is narrower: where the phenomenon exists in a market for safety-critical products, the consequences of the substitution are not measured in nutritional outcomes or product disappointment. They are measured in failure events with physical-injury consequences.

The phenomenon as it is reported in the elevator sector

The Indian engineering trade press has documented, with names and locations attached, a recurring pattern in the lower-tier and informal segments of the Indian elevator market. The pattern, as reported, includes the substitution of cheaper, lower-grade controllers in installations where the original specification called for traceable, certified components; the use of falsified or absent test certificates on safety-critical components; and the awarding of maintenance contracts at price points that do not permit the equipment's specified maintenance regime to be performed.

The Telangana Today reporting summarised in Chapter 4, and the international coverage in Elevator World, is one example of trade-press documentation. Coverage in Citizen Matters Mumbai of the Maharashtra lift inspectorate's investigations is another. Indian engineering professionals quoted in those publications — including the engineer Murthy, formerly of KONE and Otis India, cited in Chapter 4 — describe the cluster of practices in language that is consistent with the structural framing of this chapter.

The five-step sequence below is a stylised summary of the pattern as it has been reported. It is not the pattern of any specific named firm. It is a structural description of how the failure mode emerges and propagates.

1. **Brand-trust intake.** A multinational or branded supplier offers a product line in the Indian market under the same or near-identical packaging used in other markets. The branding signals quality.
2. **Procurement-side price compression.** Local procurement, operating under price-led tender pressure, drives the supplier toward a cost reduction.
3. **Specification substitution downstream.** Somewhere along the supply chain, components are substituted, certifications are not maintained, or installation supervision is reduced. The substitution is not visible to the customer at the point of acceptance.
4. **Apparent saving at procurement stage.** The developer, EPC contractor, or building owner records a saving on the procurement spreadsheet — typically in the low single-digit percent of the elevator line.
5. **Failure under real-world duty cycles.** Years later, the substituted components or unmaintained system fails. The failure produces incidents, in some cases fatal, of the kind documented in Chapter 4.

The position of this paper

The position of the authors is unambiguous: in the elevator sector, where physical safety is the unforgiving consequence of specification, the localised-degradation pattern is incompatible with responsible practice and should be opposed by the industry as a matter of professional conduct. The authors operate, and have always operated, on the inverse principle: identical specifications globally, no 'local market' downgrades, full traceability for every safety-critical component. Hidral has applied this principle as a fifty-year company policy across its export markets. Gilco Global, through its Orona partnership, applies the same EN 81 specification to its Indian deliveries that Orona ships into European installations.

This is a normative position, declared openly. It is not a claim that no other reasonable position exists, and it is not an accusation against any specific firm. It is a statement of the principle that the authors believe should govern the next phase of Indian elevator industry conduct, and a contribution to the public conversation about how to make that principle prevail in a competitive market.

The moral floor

This should not need to be stated in a 2026 industry paper. But the structural pressures examined in this chapter make it worth stating explicitly, at the front of the elevator-sector argument, where it can be referenced in any subsequent disagreement about specification, price, or compliance. The closing of the gap between safety-critical-product quality in India and safety-critical-product quality in mature European or North American markets is the central work of the next decade. Regulation is necessary to that work; it is not sufficient. Industry conduct, on a firm-by-firm and contract-by-contract basis, is what makes regulation effective.

> **THE RELEVANCE OF THIS CHAPTER**
> If a market fails to detect quality at the point of purchase, lowest-bidder competition does not produce efficient outcomes. It produces a structurally degraded equilibrium. The IS 17900 mandate begins to address this by raising the verifiable floor; industry conduct, supplier transparency, and procurement-side discipline are needed to keep the floor in place.

PART SIX

Four structural forces reshaping the Indian market.

Why the conditions for a quality-led repositioning of Indian elevator procurement are now in place — and why this window will not stay open indefinitely.

Part One of this paper has set out the evidence. Part Two turns to the constructive question: why the Indian elevator market is — independently of any single firm's preferences — moving in a direction that makes quality and safety commercially viable in segments where they previously were not. The argument is not that the market has solved its problems. The argument is that four structural forces are converging in a way that creates genuine commercial leverage for quality-led firms, for the first time in the recent history of the Indian sector.

The four forces are: (i) the IS 17900 regulatory shift; (ii) the rise of real per-capita incomes and the consequent shift in middle-class procurement priorities; (iii) demographic ageing and the consequent emergence of structural demand for residential and home-lift solutions; and (iv) the architectural pressure on urban land that makes car lifts a margin lever rather than a cost item. None of these forces, in isolation, would be sufficient to reposition the market. Together, they are.

Force one — Regulatory: IS 17900

On 22 December 2025, IS 17900 became mandatory for new elevator installations across most of India. After more than two decades operating under the IS 14665 series — first published in 1999 — the country's safety framework is now aligned with ISO 8100-1:2019, the international reference standard, which is itself harmonised with the European EN 81-20 and EN 81-50 norms[14]. As of mid-2025, fifteen Indian states and one Union Territory had formally adopted the new code through their respective state Lifts Acts[15]; the remaining states are expected to follow on a rolling basis, though the pace of state-level adoption is uneven and is itself a substantial industry-policy issue (see Chapter 7).

The technical content of IS 17900 is examined in detail in the next chapter. The point relevant here is the framing effect. The standard removes the most common technical excuse for substandard elevator product in the Indian market — that 'this is what the local market can absorb' — by making the modern global safety floor a legal requirement rather than a commercial choice. The argument that quality features are a developed-market luxury, and that Indian conditions justify lower specifications, is no

longer available to a compliant supplier. What remains is the work of making compliance universal in practice.

Force two — Economic: rising real incomes

India's GDP per capita rose from approximately USD 1,560 in 2014 to USD 2,697 in 2024, an increase of approximately 73% in nominal terms over a single decade[16]. The shift is more pronounced in the urban upper-middle-class segment that drives premium-tier residential and commercial real-estate purchasing decisions, and where the willingness to pay for verified safety, lifecycle reliability, and after-sales service has visibly increased over the same period.

USD 2,697

India GDP per capita, 2024

World Bank — World Development Indicators (current US$)

The practical implication for elevator procurement is direct. The marginal cost of moving from a non-compliant elevator product to a fully IS 17900-compliant one is, on KONE India's publicly stated estimate for one of its product lines, approximately 4% — within the 2% to 5% range that the same source describes as 'minimal and absorbable by customers' in the broader market context. The marginal willingness-to-pay of the upper-middle Indian consumer, when the safety differential is properly explained, is in most segments meaningfully higher than 4%. The economics of selling verified-safety premium have therefore shifted in favour of compliant suppliers. The constraint, in this segment, is no longer consumer affordability. It is whether the industry has the procurement-language and customer-education capacity to have the conversation.

Force three — Demographic: ageing and home lifts

Life expectancy at birth in India has risen from approximately 58 years in 1990 to over 70 years today. The Indian population aged 60 and above currently stands at approximately 140 million and is projected to exceed 300 million by 2050 according to United Nations Population Division estimates and NITI Aayog projections. Tens of millions of older Indians, in this projection, will continue to live in multi-storey residences in which staircase access becomes progressively more difficult — a trend that drove the

residential lift markets of Japan in the 1990s, of Germany in the 2000s, and of Italy in the 2010s, and that is now visibly emerging in India.

This is the same structural demographic mechanism that produced sustained residential and home-lift markets in mature economies. It is not a discretionary lifestyle choice; it is a mobility necessity. A seventy-year-old Indian living on a second floor needs a lift, regardless of national GDP. The demographic argument therefore makes the residential and home-lift segment a multi-decade structural market rather than a fashion-driven one.

Force four — Architectural: urban land scarcity and car lifts

Urban land is India's most economically constrained resource. In Mumbai, premium-segment residential land in localities such as Malabar Hill and Worli sells in the range of approximately ₹35,000 to ₹1.2 lakh per square foot, depending on view and amenity quality. Conventional automobile ramps in residential and mixed-use buildings consume between roughly 30% and 40% of the parking-floor footprint — space that produces no revenue. The opportunity cost of that footprint, in premium Mumbai locations, is substantial.

Car-lift systems offer a directly competing solution. By replacing the ramp with a vertical-transportation system, the parking-floor footprint can be reduced materially, and the recovered area becomes saleable or leasable. The economics of this trade-off are examined in detail in Chapter 8; the point relevant here is the market-signal effect. In premium-tier projects, architectural and developer preference for car-lift solutions is rising, and the segment now exists at commercially meaningful scale. The question is no longer whether to install car lifts; it is whether to install them well — i.e. with the duty-cycle ratings, redundancy, and maintenance regime that the application requires.

The convergence

The four forces do not act in isolation. The regulatory shift makes substandard product harder to sell. Rising incomes make verified-quality product easier to sell. Demographic ageing creates demand in residential segments that did not exist on the same scale before. Urban-land scarcity creates demand for car lifts and other architectural-optimisation solutions. The combined effect is to widen the commercial space in which a quality-led, transparently specified, fully compliant elevator firm can operate — and to narrow the commercial space in which lowest-bidder competition on opaque specifications can persist.

The window for industry-led repositioning is, in the authors' assessment, approximately five to ten years. After that, the market will sort itself either toward universal compliance and quality-led competition, or

toward a long-tail of legacy substandard installations carrying disproportionate failure risk. The firms that begin the repositioning now have the competitive advantage of incumbency in the new equilibrium. Firms that wait will find that, by the time the conversation has changed, they have not.

ALLIES, NOT OBSTACLES

The four structural forces are not threats to the Indian elevator industry. They are the strongest commercial tailwind for quality-led providers that the market has produced in two decades. Reading them correctly — and structuring the firm to benefit from all four simultaneously — is the central commercial work of the next five years.

PART SEVEN

Anatomy of IS 17900: what the standard requires.

A technical examination of the Indian Standard that became mandatory on 22 December 2025, framed for the procurement officer, the developer, and the regulator.

Most readers of this paper will know IS 17900 by name. Fewer will have read the standard itself; even fewer will have considered each provision in detail. This chapter walks through the technical content at the level of an engineer briefing a non-specialist — close enough to the technical material to be precise, but framed so that procurement officers, developers, building-society members and regulators can act on it. The standard is long, and a single chapter cannot reproduce it. Readers seeking the full text are referred to the published BIS document (IS 17900 Part 1: 2022 and Part 2: 2022).

The headline shift

IS 17900 is not a marginal update of IS 14665, the 1999 Indian standard it replaces. It is a wholesale realignment of Indian elevator safety code with ISO 8100-1:2019, the global reference standard, which is itself harmonised with the European norms EN 81-20 and EN 81-50[17]. The structural significance of this realignment is that the technical floor in India is now, in regulatory principle, the same technical floor that has governed European and most ISO-aligned international elevator markets for the past decade. The provisions that follow are the most consequential.

UCMP — Unintended Car Movement Protection

Unintended Car Movement Protection prevents the lift car from moving when the doors are open. It is a system of redundant detection and braking that engages when the cab attempts to leave a landing while the doors are not in their fully closed and locked state. UCMP is the safety feature most directly correlated with the entrapment-fatality category — including, in technical principle, the type of incident that produced the two child fatalities in Hyderabad documented in Chapter 4. UCMP has been mandatory under EN 81-20 since 2014. Under IS 14665, it was a recommended feature; under IS 17900, it is mandatory for new installations.

ACOP — Ascending Car Overspeed Protection

Ascending Car Overspeed Protection prevents catastrophic upward acceleration of the elevator car. The classic failure mode it addresses is one in which a control failure or counterweight imbalance produces uncontrolled upward movement; in incidents where ACOP is absent, the cab can be propelled into the headroom of the shaft at speeds exceeding the design envelope. ACOP has been mandatory under EN 81-20 since 2014. Under IS 17900, it is now mandatory in India as well.

Refuge spaces for technicians

IS 17900 mandates clearances and refuge spaces in the lift pit and on the car top, sufficient to protect a maintenance technician working in those positions from being crushed by car or counterweight movement. This is a long-standing European requirement. Its absence from previous Indian standards has corresponded to a category of occupational fatality among Indian elevator maintenance technicians that the trade press has documented but that has rarely been discussed in mainstream coverage. IS 17900 closes this gap for new installations.

Other provisions of consequence

In addition to the three provisions above, IS 17900 mandates a set of further safety and resilience features that, in aggregate, bring Indian elevator installations into substantive alignment with ISO 8100-aligned international practice:

- One-hour emergency cab lighting, with battery backup tested under loaded conditions.
- Emergency communication systems with two-way voice capability and continuous monitoring.
- Reinforced door systems with verified door-locking integrity, including light curtains and tamper-resistant hardware.
- Fire and earthquake resilience protocols, including fire-recall behaviour and seismic-event response.
- Defined inspection, testing, and maintenance protocols for the operational phase, with documentary requirements for the building owner.
- Programmable Electronic System in Safety-Related Applications for Lifts (PESSRAL) compliance for safety-related electronic functions.

The cost of compliance

In a Business Standard interview published on 27 July 2025, Amit Gossain, Managing Director of KONE Elevator India, addressed the cost question directly. The new code may produce a price increase of

approximately 2% to 5% on compliant equipment, which Gossain described as 'minimal and absorbable by customers.' KONE itself measured a 4% increase on one of its product lines in the transition[18]. For local or smaller manufacturers that have historically not adhered to comparable specifications, Gossain noted, the price increase would be considerably higher — a candid acknowledgment that the market segment most likely to resist universal compliance is the segment whose cost gap to the new standard is largest.

≈ 4%

Price increase measured by KONE India on a product line transitioned to IS 17900 compliance

Amit Gossain, MD KONE Elevator India, in Business Standard, 27 July 2025

The wider context for this figure: KONE India holds approximately 25% of the Indian elevator market by volume; together with Otis, Schindler, Johnson Lifts and TK Elevator, the top five suppliers account for approximately 85% of the market in volume terms. The remaining roughly 15% — predominantly small and mid-tier domestic manufacturers — represents the segment in which the cost-of-compliance gap is largest, and in which the tension between IS 17900 enforcement and current price-led competition is most acute.

The state-level enforcement gap

BIS codes do not become legally binding automatically across the Indian Union. They become binding when individual states issue notifications or amend their respective Lifts Acts to reference the new code. As of mid-2025, fifteen states and one Union Territory had adopted IS 17900 through their state-level frameworks. Several states with substantial construction pipelines — including parts of the high-growth Tier-II city base — had not yet done so at that date. Without universal state-level adoption, non-compliant products continue to undercut compliant products on price in the unadopted states, producing the structural distortion that the BIS reform was intended to eliminate. The KONE India MD's public statement urging all states to adopt the code without delay reflects this concern.

The installed-base question

The new standard governs new installations. India's existing installed base — widely estimated at approximately 1.5 million lifts in service — was largely installed under IS 14665 or earlier and is not retroactively required to meet IS 17900. How the industry, the regulators, and the building-owner

community respond to this legacy fleet — through modernisation, retrofit, replacement, or selective enforcement — will define the safety record of Indian buildings for the next twenty years. The new-installation problem is, in technical-regulatory principle, partially solved. The installed-base problem remains substantially open. Some elements of the response framework exist: IS 17386 (2019) provides specific guidance on safety rules for existing lifts, and several state Lifts Acts include modernisation provisions. The adequacy of these provisions, in the face of the scale of the legacy fleet, is a substantial open policy question.

THE NEW DEFAULT, AND THE WORK THAT REMAINS

IS 17900 makes the modern international safety standard the regulatory default for new Indian elevator installations. The work that remains is universal state-level adoption, comprehensive enforcement, and a coherent strategy for the legacy installed base. None of these is a regulatory problem alone; each requires industry leadership.

PART EIGHT

Spatial ROI: car lifts and the economics of urban land.

Why properly specified car-lift systems are a margin lever for the developer, not a cost item — and why the engineering of a long-life car lift is not negotiable.

The argument for car lifts in Indian premium real estate is, in principle, simple. Urban land is finite. Conventional automobile ramps consume between roughly 30% and 40% of a building's parking-floor footprint and produce zero revenue. Car-lift systems substitute a vertical-transportation system for the ramp; the recovered footprint becomes saleable, leasable, or available for amenity use. In premium-segment Indian projects, the arithmetic of this trade-off is in many cases overwhelmingly in favour of the car lift. The opportunity is genuine. The trap, examined later in the chapter, is in specifying the equipment incorrectly.

The Mumbai example

Consider an illustrative 20-storey luxury residential project in South Mumbai. The project requires substantial parking provision; the parking-floor footprint, on a conventional ramp design, would consume between approximately 30% and 40% of the building's lower-level area. In premium South Mumbai locations, where saleable area sells at ₹35,000 to ₹80,000 per square foot in the broader premium tier and at up to ₹1.2 lakh per square foot in the highest-tier sea-facing localities, the recovered footprint from a car-lift solution corresponds to a meaningful uplift in saleable area on the project.

The order of magnitude of this uplift, on a project of this scale, is in the tens to hundreds of crore rupees of additional saleable area, depending on the specific site and the price band of the surrounding inventory. Car lifts in this context are not exotic features. In the premium tier, they are increasingly an arithmetically obvious investment, paying back the equipment cost in saleable area many times over.

Tens to hundreds of crores

Indicative saleable-area uplift on a 20-storey premium South Mumbai residential project from car-lift adoption

Authors' analytical illustration; magnitude depends on site, locality, and price band

The duty-cycle problem

The arithmetic above holds only if the car lift actually works for the duration of the building's life. And here is where the procurement category error described in earlier chapters reappears in a particularly dangerous form. A car lift in a residential building runs between roughly 1,500 and 4,000 cycles per year, lifting two to three tonnes per cycle. That duty profile is materially more demanding than a passenger lift in the same building. An under-specified car lift fails inside three to five years, takes the parking system out of service for months while remediation is litigated, and triggers liability disputes between developer, building society, and elevator vendor that often end in court.

The properly specified version of the same equipment runs for twenty-five years with scheduled maintenance and accepted-rate repair. The price differential between the two is typically in the range of 25% to 40% of the upfront equipment cost. The cost-of-failure differential — when the under-specified system fails on a luxury project whose margin uplift depended on the car-lift adoption — is closer to ten times the equipment-cost differential, summed over the litigation, remediation, and reputational impact horizon. The procurement-spreadsheet logic that recommends the cheaper option is not robust to the operational realities of the application.

Indian car-lift price reality

The Indian market price for car-lift equipment varies materially by capacity, application, and quality tier. Aggregated supplier listings on IndiaMart for hydraulic vertical car-lift units indicate a range of approximately ₹6.5 lakh per unit at the entry tier, rising into the ₹20 lakh to ₹40 lakh band for higher-capacity (4-tonne and above), heavier-duty industrial and commercial systems[19]. The full system cost on

a multi-unit residential or commercial deployment, including installation, integration, and shaft works, scales accordingly.

These figures are the per-unit equipment cost. They are not the total project cost of a multi-car-lift deployment, which depends on the number of units, the integration with the building's overall vertical-transportation strategy, and the spec level chosen. The point is that the equipment cost itself, on a single-unit basis, is well within the range of saleable-area uplift values calculated for premium projects — confirming the directional argument that car lifts in this segment are a margin lever, not a cost item.

Specification disciplines that matter

The specification differences between a long-life car-lift system and an under-engineered one are well understood in the engineering community and are documented in the BIS standards series (IS 17900 for new lifts, IS 17386 for safety rules for existing lifts, the IS 17515 series for energy performance). The most consequential at the procurement stage are:

- Cycle rating verified by the manufacturer for the specific duty profile of the project, not assumed from a general catalogue.
- Hydraulic system sizing matched to the load profile, with appropriate redundancy in the power unit.
- Guide rail material and section confirmed for the load class — hot-rolled rather than cold-drawn, where heavy-load duty applies.
- Door system rated for the cycle frequency, with verified seal integrity and emergency operation.
- Control system architecture with proper diagnostic capability and remote monitoring access for the maintenance team.
- Maintenance contract awarded to a provider with documented technical capability for the specific system, not the lowest bidder for parking-equipment maintenance generally.

Each of these is verifiable at the specification stage. None requires the developer or procurement officer to be an elevator engineer. What it requires is a procurement process that asks the right questions, demands the right documentation, and refuses to accept generic catalogue responses. The next chapter expands this principle into a Total Cost of Ownership framework that applies across all elevator categories, not just car lifts.

THE OPPORTUNITY AND THE TRAP

The car-lift segment is one of the clearest examples in the Indian market today of where quality-led specification produces commensurate commercial returns — and one of the clearest examples of where lowest-bidder specification destroys the asset-value uplift it was supposed to enable. The specification discipline is the difference. Price is downstream of specification, not a substitute for it.

PART NINE

Total Cost of Ownership over a 20-year horizon.

An iceberg analysis of what cheap elevators actually cost over the asset's operating life — and why upfront-price-only procurement is not a discipline but an evasion.

When a developer or procurement officer compares two elevator quotations, what is visible is the upfront equipment price — the waterline of the iceberg. What is not visible at the procurement stage, but is fully visible by year five and dominant by year twenty, is the submerged majority of the real cost. This chapter sets out the four submerged cost categories and develops a 20-year Total Cost of Ownership comparison that should, in the authors' position, be the basis on which serious elevator procurement decisions are made.

The four submerged costs

Breakdown maintenance

Each emergency call-out for an Indian residential elevator is reported in housing-society records to cost in the range of ₹2,500 per visit plus parts. When a substandard installation breaks down once or twice per month — a frequency that is realistic for under-specified systems in their second through fifth year — the cumulative cost does not aggregate linearly. It compounds, because each failure accelerates wear in the surrounding components, and because emergency maintenance pricing is consistently higher than scheduled-maintenance pricing on a per-hour basis. Over a five-year horizon, breakdown maintenance for a substandard system can exceed the original equipment cost. Over a 20-year horizon, the figure is several multiples of the original installation.

Production halts and operational disruption

In industrial settings — automotive logistics hubs, pharmaceutical manufacturing, cold-chain distribution centres operating just-in-time supply — a single elevator failure produces direct production-line halts. The cost is denominated in lakhs to crores of rupees per day, depending on the application. Penalty clauses in supplier contracts amplify the cost: a four-hour heavy-load freight elevator stoppage at a tier-one automotive supplier can trigger penalty payments to the OEM in the range of ₹50 lakh to ₹2 crore, depending on contract structure. In commercial real estate, equivalent disruption manifests as lease-

penalty exposure and tenant flight, neither of which appears in the procurement-stage spreadsheet but both of which are real.

Asset depreciation

An elevator that gives recurring trouble lowers the rating of the entire building. Tenants leave; rents fall; resale values decline; new-tenant acquisition costs rise. The depreciation is not limited to the elevator system — it spreads across the asset, because the elevator failure compromises the building's basic functionality. In commercial real estate, an unreliable lift system can reduce achievable rental rates by an estimated 5% to 15%, with corresponding effects on capital value. In residential housing societies, the asset-value impact manifests as reduced unit re-sale prices and constrained new-tenant demand.

Legal exposure under Indian penal and lift-acts law

Section 304(A) of the Indian Penal Code — death by negligence — carries a maximum penalty of two years' imprisonment, and is the section under which the building owner, society chairman, or installer can be prosecuted following a fatality involving a non-compliant or improperly maintained lift. Under several state Lifts Acts — notably the Maharashtra Lifts Act — state authorities investigate lift fatalities and refer cases to the police where negligence is identified. The cost of legal defence in a fatality case routinely exceeds, by several multiples, the savings of any procurement-stage decision that produced the underlying failure. This category is most often the one entirely missing from procurement-stage TCO modelling, despite being, in some segments, the single largest contingent liability.

The 20-year aggregate

1.5× to 2.2×

Total 20-year cost of an under-specified elevator versus a quality-grade alternative, when the four submerged cost categories are properly accounted for

Authors' analytical synthesis based on housing-society maintenance data, industrial penalty-clause exposure, and Indian legal-cost case material

The exact ratio depends on the segment, the duty profile, and the specific maintenance practice; the order of magnitude is robust across reasonable model variations. The headline result is that the 'saving' produced by under-specification at the procurement stage is, in expected-value terms over a 20-year

operating horizon, more than offset by the submerged costs that accumulate over that horizon. The 'saving' is, in financial terms, a down payment on a future liability.

Why TCO is rarely measured properly in current Indian practice

If the TCO arithmetic is so unfavourable to lowest-bidder procurement, why is lowest-bidder procurement still dominant? The answer is structural and is not a story about individual irrationality. Three factors interact:

- The procurement decision and the failure consequence are decoupled in time. The procurement officer's career-stage incentives reward visible upfront cost discipline; the cost of failure manifests under a successor's tenure, often a decade or more later.
- The procurement decision and the failure consequence are decoupled in organisational accountability. The developer who sells the project, the housing society that occupies it, the maintenance contractor who services it, and the regulator who certifies it are different organisations with different incentive structures. None of them, individually, internalises the full TCO.
- The information asymmetry between vendor and buyer favours the vendor. Buyers in many segments are not engineers; they cannot independently verify that a 'compliant' specification actually meets the standard. This is the structural condition that makes the under-specification temptation persistent, and that the IS 17900 framework — particularly its component traceability and certification provisions — is designed to begin to correct.

The implication is not that buyers are foolish. The implication is that the procurement-stage information environment systematically misleads even careful buyers, and that institutional reforms — TCO disclosure as a tender requirement, third-party inspection as a regulatory default, transparent component traceability — are needed to align the procurement decision with the asset's actual lifetime cost.

> **THE PROCUREMENT REFORM**
>
> TCO is not a sophisticated optimisation tool; it is the minimum honest accounting framework for a 20-year safety-critical asset. Procurement teams that do not apply it are, in effect, transferring risk to building occupants who are not at the table. Procurement teams that do apply it find that the rank-ordering of vendor proposals frequently changes — and that the change is robust to the assumptions used in the modelling.

PART TEN

The new language of elevator procurement.

On why the words used to evaluate vertical-transportation purchases must change — and why the firm that begins teaching the new vocabulary today acquires the strategic advantage in the new market equilibrium.

Language shapes decisions. Procurement language, in particular, encodes which questions are asked at the tender stage, which evidence is treated as decisive, and which trade-offs are made visible to the decision-maker. The dominant procurement vocabulary in Indian elevator procurement today encodes a frame in which upfront price is the decision variable and almost everything else is a footnote. Reform of the procurement frame begins with reform of the procurement language.

The old vocabulary

Four phrases dominate elevator procurement language in India today. Each, examined honestly, encodes a category error of the kind described in Chapter 2.

THE OLD CONVERSATION	THE PROFESSIONAL CONVERSATION
~~Price per unit~~	**IS 17900 compliance & verifiable component traceability**
~~Upfront capex saving~~	**20-year Total Cost of Ownership (TCO)**
~~"Local market" specification~~	**Identical global safety specification**
~~Lowest-bidder maintenance~~	**Specification-aligned maintenance and Section 304(A) risk mitigation**

Each of the left-hand terms answers a question that, on its own, is too narrow to support a sound procurement decision for safety-critical infrastructure with a 20-year service life. 'What is the price per unit' tells the buyer nothing about lifecycle cost, failure rate, or compliance. 'What is the upfront capex

saving' tells the buyer nothing about the contingent liability they are simultaneously acquiring. 'What is the local-market specification' is, as established in Chapter 5, in some segments a euphemism for substandard configuration — and is now, after IS 17900, a legally compromised concept. 'What is the lowest-bidder maintenance contract' predetermines that the maintenance will, by definition, be performed below the level the equipment requires.

Each of the right-hand terms answers a question that, taken together, supports a sound procurement decision. 'Is this installation IS 17900 compliant, with traceable certification for every safety-critical component, verifiable on demand?' 'What does this system cost to own and operate over 20 years, including breakdown maintenance, scheduled maintenance, modernisation reserve, and end-of-life cost?' 'Are these specifications identical to what the manufacturer ships into European or other ISO 8100-aligned markets, or are they a market-specific variant?' 'What is the legal exposure of the building owner under Section 304(A) and applicable state Lifts Acts of installing or operating this equipment, and how does that exposure compare with the alternative?'

Why the new vocabulary is uncomfortable

The new vocabulary is harder to use. It requires more technical knowledge, more legal knowledge, more documentary discipline, and more willingness to have a conversation that the customer is not always prepared to have. It cannot be reduced to a single number on a single line of a single spreadsheet. It is, in the literal sense, more work for the procurement officer, the salesperson, and the technical-evaluation team.

It is also more honest. And, for any firm whose competitive position rests on engineering quality, lifecycle reliability, or safety performance, it is strategically essential. A market that buys on upfront price will, over time, sort itself toward the lowest bidder regardless of capability. A market that buys on TCO and verifiable compliance will sort itself toward the most competent supplier. Which market a firm wants to compete in — and which market the Indian elevator sector wants to be — determines which vocabulary the firm must use, and must teach its customers to use.

The five-year window

The shift from the old conversation to the new will not happen evenly across the market. It will happen first among the most sophisticated buyers — the largest developers, the institutional building owners, the multinational tenants who already operate under TCO frameworks in their other procurement categories, and the public-sector clients in airport, metro, and hospital projects where compliance documentation is already a tender condition. It will spread to mid-tier buyers as the early adopters publicly demonstrate

the financial returns and as the legal-defence value of compliance documentation becomes clearer. It will arrive last in the price-led commodity segment, and may not arrive there at all.

The firms that begin teaching the new vocabulary today — through the way they structure proposals, through the technical materials they put in front of the customer, through their conduct in tender meetings — will be the natural beneficiaries of the shift when it consolidates. The firms that wait will find that, by the time the conversation has changed, they have not. The repositioning is not a single corporate-communications exercise. It is a procurement-by-procurement, contract-by-contract, conversation-by-conversation discipline.

From procurement vocabulary to industry conduct

Language reform is necessary but not sufficient. The next part of this paper turns from analysis to action. Part Three sets out a seven-principle manifesto for industry conduct, framed for individual adoption by any firm in any segment of the Indian elevator value chain, and proposes specific next steps for seven actor categories — manufacturers, installers, developers, building owners, regulators, financiers, and the engineering and journalistic press. The aim is not to prescribe a single industrial strategy. It is to make the first step adoptable enough that no actor can credibly claim there is nothing they can do.

> **LANGUAGE IS LEVERAGE**
>
> Every proposal a quality-led firm submits in the next five years is an opportunity to demonstrate the new vocabulary. Every tender is an opportunity to ask the questions the old conversation suppresses. Every renewed maintenance contract is an opportunity to insert TCO and compliance metrics that did not exist in the previous version. The transition is happening contract-by-contract — and is happening now.

PART THREE — THE MANIFESTO

Seven principles for vertical integrity in India.

A manifesto for the next decade of Indian elevator design, supply, installation, and maintenance — written to be adopted, not just read.

This is the operative section of the document. Parts One and Two have set out the diagnosis. What follows is the prescription — a set of seven principles that, taken together, define what it would mean for a firm or institution to operate with what this paper calls 'vertical integrity' in the Indian elevator market over the next decade.

These principles are not a regulatory framework, and they are not a code of practice in the formal sense. They are commitments. They are designed to be adoptable individually, by any single firm or institution that wishes to take a public position on safety, quality, and procurement discipline. They are also designed to be adoptable collectively, by industry associations, regional consortia, or state regulators that wish to use them as the basis for a binding standard. They are written in active voice. Each begins with 'We commit.' Each is followed by a brief explanation of what the commitment means in operational practice, and what its absence looks like.

The authors of this paper — Hidral S.A. and Gilco Global, the latter as the Indian arm of Orona Group — have, in the course of preparing this document, conducted an internal review of their own conduct against these seven principles. The conclusion of that review is that both firms operate today in alignment with all seven, and that the public adoption of the principles in this document is a formalisation of existing commitment, not a change in policy. The authors would welcome public adoption of the same principles by any other firm in the Indian or international elevator industry, regardless of any commercial relationship with the authors.

1

Identical global safety specifications.

We commit to specify, supply, install, and maintain elevator equipment to the same safety standard regardless of geographic market. There is no 'Indian version' of a safety feature. There is no 'local market'

downgrade of a controller, brake system, or door interlock. The engineering rationale for a safety component does not change because of the postcode of the building it is installed in. Where Indian regulatory minimums fall below international best practice, we apply international best practice. Where they meet or exceed it, we comply fully and transparently.

2

Full IS 17900 compliance, beyond the deadline and beyond the state-level mandate.

We commit to deliver IS 17900 compliance on every new installation, regardless of whether the state in which the building is located has formally adopted the standard through its Lifts Act. We do not exploit gaps in state-level enforcement. We do not offer 'pre-compliance' or 'transition' pricing tiers for non-compliant variants. The standard is the floor of our specification, not a target.

3

Verifiable traceability for every safety-critical component.

We commit to provide, on request, full documentation of the source, certification, and specification of every safety-critical component installed in our equipment — including controllers, governors, door interlocks, brake systems, and power units. We do not install components for which traceability cannot be demonstrated. We do not accept components from supply chains that cannot produce certification on demand. We treat counterfeit or falsified certification as a contract-breaking offence, not a procurement risk to be managed.

4

Total Cost of Ownership in every commercial proposal.

We commit to present every commercial proposal with an explicit 20-year Total Cost of Ownership analysis alongside the upfront equipment price. The analysis includes scheduled maintenance, projected breakdown maintenance, energy consumption, modernisation reserve, and end-of-life disposition cost. We refuse to participate in tender processes that explicitly prohibit the presentation of TCO analysis. We refuse to evaluate competing proposals on upfront price alone.

5

Maintenance contracts that match the equipment's specification.

We commit to write, sign, and execute maintenance contracts at the technical level the installed equipment actually requires — not at the level the lowest bidder is willing to undercut. Visit frequency, parts allowance, technician certification, and response-time commitments are aligned with the manufacturer's specification, not with the cheapest available offer. Where customer pressure pushes maintenance commitments below safe operating thresholds, we walk away from the contract and document the decision.

6

Honest, public engagement with the safety record.

We commit to publish, share, and engage honestly with the Indian elevator safety record. We do not minimise the documented fatality numbers. We do not blame consumer behaviour for outcomes that originate in procurement and installation decisions. We acknowledge the role our industry collectively plays in the current state of affairs, and the responsibility our industry collectively bears for changing it. Public honesty about the problem is the precondition for legitimate participation in the solution.

7

Refusal of the underbidding race.

We commit to refuse to participate in tender processes whose specifications, evaluation criteria, or maintenance terms make safe execution commercially impossible. We name those specifications publicly when they appear. We document and share, on a no-names basis, the cases in which we have walked away from contracts on this basis. We treat the willingness to walk away from unsafe work as a competitive advantage, not a commercial cost — because in the long run, it is.

The principles are stated in absolute language, deliberately. The authors recognise that absolute commitments, applied to a complex commercial environment, can encounter edge cases — supply-chain disruptions, regulatory ambiguities, customer demands that fall just short of unsafe but are nonetheless awkward. The response to edge cases, in the framework proposed here, is not to weaken the principles. It is to document the case publicly, to seek peer review of the response, and to use the case to refine the principle for future situations. Transparency under pressure is what distinguishes a real commitment from a marketing slogan.

ADOPTION IS A PUBLIC ACT

A firm that adopts these principles privately, in internal documents, has done something useful. A firm that adopts them publicly, with a written statement attached to its own corporate identity, has done something different. Public adoption creates a verifiable record against which subsequent conduct can be measured — by employees, customers, journalists, and regulators — and is, in the authors' view, the form of adoption that materially shifts industry conduct over time.

PART TWELVE

What each actor can do, starting tomorrow.

Concrete, adoptable next steps for the seven categories of stakeholder whose decisions, between them, determine how India's vertical infrastructure ages over the next thirty years.

The seven principles in Chapter 11 are abstract. The work of changing the Indian elevator market is concrete. This chapter translates the principles into specific, adoptable actions for each category of actor with a stake in the outcome. Each subsection is short by design. The intent is not to be exhaustive — that would be impossible across a market this large and this differentiated. The intent is to be adoptable. If a single firm or institution in any of the seven categories implements even one of the actions below in the coming year, this paper will have earned its keep.

For elevator manufacturers and component suppliers

- Publish a public statement of compliance with the seven manifesto principles, signed by named senior leadership.
- Audit the firm's Indian product range for any specifications that diverge from the equivalent product sold in EU or other ISO 8100-aligned markets, and publish the results.
- Implement and publish a component-traceability protocol for every safety-critical component used in Indian installations, with sample documentation made available to customers on request.
- Provide TCO analysis as a default deliverable in every commercial proposal in the Indian market, on a methodology that the customer can independently verify.
- Establish an internal review process for tender refusals on safety-specification grounds, and publish anonymised case examples annually so that the industry can see what is being refused and why.

For installation contractors and maintenance providers

- Publish technician certification requirements for every contract category, and verify them at the contracting stage and at periodic intervals during the contract.
- Refuse maintenance contracts that price below the visit frequency and parts allowance that the equipment actually requires, and document the refusal in writing.

- Issue annual written reports to building owners detailing the actual maintenance work performed, not just the contractual minimum, with photographic and parts-replacement records attached.
- Implement a whistleblower process for technicians to report unsafe equipment without commercial retaliation.
- Decline to take over maintenance of installations whose original specification cannot be verified, and refer such cases to the relevant state lift inspectorate.

For real-estate developers and architects

- Specify IS 17900 compliance explicitly in every tender, regardless of state-level mandate. Make this a contractual requirement with documented verification at handover.
- Require TCO analysis as a mandatory deliverable in every elevator vendor proposal, with a defined modelling methodology that vendors must use.
- Refuse to evaluate elevator proposals on upfront price alone — issue evaluation criteria that weight lifecycle cost, compliance, and supplier track record.
- Include legal counsel in elevator procurement decisions for any project involving multi-occupancy or safety-critical use, and document the legal review.
- Publish the safety record and IS 17900 compliance status of installed elevator systems in marketing materials for premium projects, treating it as a positive differentiator rather than a regulatory footnote.

For building owners, RWAs, and facility managers

- Commission an independent safety audit of every elevator system more than ten years old, performed by a certified inspector who is not the maintenance provider.
- Request and verify, in writing, whether each installation in the building is IS 17900 compliant, and if not, what would be required to bring it into compliance, with cost estimates and a timeline.
- Review every maintenance contract against the equipment manufacturer's recommended visit frequency and parts allowance, and renegotiate where the contract falls short.
- Refuse to renew maintenance contracts with providers who cannot demonstrate technician certification at the level the equipment requires, and consult the state lift inspectorate's recommended provider list where one exists.
- Publish, internally to building residents, the maintenance and safety status of every elevator at least annually, with incident logs and modernisation plans.

For state regulators and BIS technical committees

- Adopt IS 17900 universally through state-level Lifts Acts, on a defined timetable, in every state that has not yet done so. Publish the timetable.
- Establish a minimum penalty framework for installation of non-compliant equipment, sufficient to remove the commercial incentive to non-compliance. Publish the schedule of penalties.
- Publish, annually, state-level data on elevator-related fatalities and serious incidents, broken down by installation type and age.
- Require certified independent inspection of every new installation prior to commissioning, performed by an inspector with no commercial relationship to the installer or supplier.
- Establish a public register of certified maintenance providers, with the right of building owners to lodge complaints and trigger investigation. Make the register searchable by city and by equipment type.

For insurance underwriters, lenders, and rating agencies

- Incorporate IS 17900 compliance status into property insurance underwriting, with materially different premiums for compliant and non-compliant installations.
- Require IS 17900 compliance as a covenant in real-estate development financing, with verification at draw-down and at completion.
- Reflect elevator safety record in commercial real-estate ratings methodologies, on a defined and disclosed weighting.
- Require disclosure of installed-base compliance status in real-estate investment trust (REIT) filings, with auditor sign-off.
- Develop and publish a sectoral risk model that quantifies the contingent legal exposure of non-compliant installations, and use it to inform credit and underwriting decisions.

For journalists, researchers, and policy analysts

- Cover elevator-related fatalities as systemic news, not as isolated incidents. Investigate the procurement and maintenance trail behind individual fatalities.
- Publish comparative safety statistics with appropriate methodological context, particularly the per-elevator fatality rate, and resist the temptation to use single-figure summaries that conceal denominator differences.

- Hold the industry — including its largest and most reputable firms — accountable for the patterns this paper describes, where evidence supports doing so.
- Provide platforms for engineering professionals to speak publicly about safety practice without commercial retaliation, recognising that named professional commentary is one of the most effective drivers of standards in the sector.

THIS LIST IS A STARTING POINT, NOT A CEILING

These actions are illustrative. A serious firm or institution working to change its conduct in this market will identify additional steps specific to its position. The point of the list is not to be the final word — it is to make the first step adoptable enough that no actor can credibly claim there is nothing they can do.

PART THIRTEEN

The architecture of accountability.

On the choice that this generation of the Indian elevator industry has, and the legacy it will leave.

India is on the verge of becoming the world's largest elevator market by annual installations. The urban growth driving that demand is real, accelerating, and structural. The investment flows are committed. The regulatory framework — for the first time since 1999 — is materially aligned with the global state of the art. The consumer is evolving. The opportunity, in commercial terms, is the largest the international elevator industry has presented in a generation.

But the industry has a choice.

It can ride this wave on price, on volume, and on minimum compliance — and deliver an infrastructure legacy that will haunt Indian cities for decades. A legacy of broken lifts, preventable accidents, and buildings that age poorly because the decisions made at installation were driven by upfront cost rather than by quality. A legacy in which, twenty years from today, somebody at this very seminar will deliver a paper titled 'The mistakes we made in the twenty-twenties.'

Or it can position itself as the quality layer of India's vertical revolution — and build something worth being proud of. A legacy of buildings that work. Lifts that run. Cities where getting from the ground floor to the thirtieth is as safe, as reliable, and as unremarkable as it should be. A legacy in which, twenty years from today, the paper delivered at this seminar is a celebration.

The authors of this paper are not naive about the commercial pressures in the current market. The pressures are real, they are documented, and they are part of the daily working environment of every firm in the Indian elevator value chain. But the authors do believe that there is a growing number of developers, architects, installers, building owners, regulators, financiers, and engineering professionals who are ready for a different conversation. People who understand that the elevator is not a feature of the building. It is the heartbeat of the building.

Hidral has been building elevator systems for over fifty years, in Seville and across more than 120 countries. Gilco Global has been building them in India since 2014, as the Indian arm of Orona Group. Both

firms publish this paper jointly because they believe the Indian market is ready for the conversation it tries to start, and because they believe — as a matter of professional ethics and as a matter of long-run commercial logic — that quality is not a European privilege. It is a universal right of the people who occupy buildings.

—

On what this paper is, and what it is not

This paper has tried to do three things. To set out the evidence for what is currently going wrong in the Indian elevator industry, with the data attributed honestly. To describe the structural forces now making a different way of operating commercially viable. And to propose a set of specific, adoptable commitments by which any actor in this market can, individually, begin to operate differently.

It is not a regulatory document. It is not a peer-reviewed academic paper. It is not a corporate marketing brochure. It is a structured intervention in an industry conversation, written by practitioners with explicit commercial interests in the outcome of that conversation, and offered openly for redistribution, citation, criticism, and amendment. Where the analysis is wrong, the authors want to know. Where the recommendations are insufficient, the authors want to hear better recommendations. The conversation that this document tries to start is more important than any individual position taken inside it.

On measuring impact

Whether the conversation this paper hopes to start finds purchase will be determined not by the document but by its readers. By the firm whose senior leadership reads this paper and chooses to commission an internal review of its Indian product range against the seven principles. By the developer who reads it and rewrites the next elevator tender to require IS 17900 compliance and TCO analysis. By the regulator who reads it and accelerates state-level adoption of the new standard. By the journalist who reads it and decides to follow the procurement trail behind the next serious incident in their city. By the

housing-society chairman who reads it and commissions an independent audit of a 15-year-old building's lift system.

The authors do not expect to measure impact in document downloads or social-media shares. They will measure impact in commitments adopted, contracts rewritten, tenders reformed, and audits commissioned. The authors will publish, on the first anniversary of this paper's release, an open-access report on adoptions and reforms that can be traced, in part or in whole, to the framework proposed here.

> **THE SINGLE COMMITMENT THAT MATTERS MOST**
>
> If you read this document, agree with even part of it, and pass it on to one person whose decisions affect Indian elevator procurement, installation, or maintenance — you will have done the work this paper was written to enable. The conversation it tries to start is bigger than any single firm. It is bigger than the authors. It is bigger than the document itself.

BACK MATTER

Glossary of technical terms.

ACOP — Ascending Car Overspeed Protection

A safety system that prevents catastrophic upward acceleration of the elevator car by automatically engaging brakes if the cab exceeds permitted speed in the upward direction. Mandatory under EN 81-20 since 2014 and under IS 17900 from 22 December 2025.

ARD — Automatic Rescue Device

A battery-operated emergency system that, on power failure, automatically moves the lift car to the nearest landing and opens the doors safely. Required under several Indian state Lifts Acts.

BIS — Bureau of Indian Standards

The national standards body of India, established under the BIS Act 2016. BIS develops, publishes, and revises Indian Standards including the IS 14665 (legacy) and IS 17900 elevator safety codes.

EN 81-20 / EN 81-50

The European standards for elevator design and installation. EN 81-20 covers passenger and goods passenger lifts; EN 81-50 covers design rules, calculations, examinations, and tests of lift components. Together they form the safety reference for European installations and are harmonised with ISO 8100.

IS 14665

The previous Indian standard series for lift installations, first published in 1999 and progressively expanded. Replaced by IS 17900 from 22 December 2025.

IS 17386 (2019)

Indian Standard providing safety rules for existing lifts — the modernisation framework intended to address the safety performance of installations that pre-date IS 17900.

IS 17515 series (2021)

Indian Standard on energy performance of lifts, escalators, and moving walks. IS 17515 Parts 1, 2, and 3 are identical to ISO 25745 Parts 1, 2, and 3 respectively.

IS 17900 (2022)

The current Indian standard for the design, installation, and operation of lifts. Aligned with ISO 8100-1:2019 (which is harmonised with EN 81-20 and EN 81-50). Mandatory across most Indian states from 22 December 2025.

ISO 8100

The international standard for lift safety, published by the International Organisation for Standardisation. Provides the global reference framework with which both EN 81 and IS 17900 are aligned.

MRL — Machine-Room-Less elevator

An elevator design in which the drive machine is located within the hoistway, eliminating the need for a separate machine room above the shaft. Now standard across most segments of the new-installation market.

NIP — National Infrastructure Pipeline

The Government of India's planning framework for infrastructure investment, with USD 1.4 trillion of investment committed in the FY 2020 to FY 2025 cycle, sustaining downstream demand for vertical transportation systems.

PESSRAL — Programmable Electronic System in Safety-Related Applications for Lifts

Electronic control architecture for safety-critical lift functions, with redundancy, fail-safe design, and dual-channel safety controllers. Referenced in IS 17900 and integrated in compliant new installations.

Section 304(A), Indian Penal Code

Causing death by negligence. Maximum penalty of two years' imprisonment, or fine, or both. Applied in Indian fatality cases arising from non-compliant elevator installations or maintenance, with referral typically by state lift inspectorates.

TCO — Total Cost of Ownership

An evaluation framework that aggregates upfront equipment cost, scheduled maintenance, breakdown maintenance, energy consumption, modernisation reserves, and end-of-life disposition costs over the asset's operating life. The basis on which this paper argues elevator procurement should be evaluated.

UCMP — Unintended Car Movement Protection

A safety system that prevents the elevator car from moving when the doors are open. Most directly correlated with the entrapment-fatality category. Mandatory under EN 81-20 since 2014 and under IS 17900 from 22 December 2025.

BACK MATTER

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Notes on sources

Where multiple sources offer divergent estimates of the same quantity — for example, the Indian elevator market size, where industry research firms produce values ranging from approximately USD 1.6 billion to USD 14.6 billion in 2024 depending on methodology and product scope — this paper has cited the most directly relevant and conservative estimate, named the source, and acknowledged the range. Readers conducting their own analyses are encouraged to consult multiple sources rather than rely on any single estimate.

The authors maintain a working bibliography that is more detailed than the version published here. Researchers, journalists, or institutions seeking the full reference list — including secondary sources consulted but not directly cited — may request it from the corresponding author whose contact details appear in the next section.

BACK MATTER

About the authors.

FOUNDED IN SEVILLE · 1975 · PRESENT IN 120+ COUNTRIES

Hidral S.A. is a Spanish elevator manufacturer with more than fifty years of engineering history. Founded in 1975 in Seville by Florencio Chacartegui Vázquez and his partners, the company is today a global supplier of heavy-load lifting platforms, car lifts, goods hoists, dumbwaiters, industrial freight elevators, and custom-engineered vertical-transportation systems for projects where standard catalogue products do not reach. Hidral operates almost 30,000 m² of manufacturing facilities across two factories in Seville and one in Logroño, with a further production plant in Indaiatuba, Brazil. The company employs approximately 300 people and produces in excess of 2,000 lifting units per year, exporting approximately 70% of its production.

Hidral operates exclusively on a business-to-business basis. The company manufactures and supplies; it does not directly install or maintain. Its customers are the elevator companies, regional ascensoristas, and direct industrial clients who design, install, and maintain vertical-transportation systems in over 120 countries. The Hidral commercial principle — applied as a fifty-year company policy — is identical specifications globally: the lifting equipment shipped to an installation in India is engineered, built, and certified to the same specification as equipment shipped to installations in Germany, Spain, France, the Netherlands, the United Kingdom, the United States, or any of the other markets in which the company operates.

In India, Hidral is in the early stages of building a long-term presence. As of the publication of this paper, the company does not have a material installed base in the Indian market; its work is focused on engineering depth, partnership building, and the introduction of heavy-load and special-application solutions where the on-the-ground Indian principal — Gilco Global — and the Indian developer and EPC contractor base have a complementary need.

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GILCO GLOBAL

FOUNDED 2014 · INDIAN ARM OF ORONA GROUP (SPAIN)

Gilco Global is one of India's most respected names in vertical mobility. The company was founded in January 2014 in Gurugram by Aman Moudgil and Gaurav Moudgil, and operates as the Indian arm of Orona Group — Spain's largest complete-lift production capacity, present in over 100 countries, with approximately one in every ten new lifts in Europe being an Orona installation. Gilco Global brings the Orona EN 81-compliant product range to the Indian market under identical European specifications.

Gilco Global has been in operation in the Indian elevator sector for approximately twelve years. The company's leadership, however, brings substantially longer experience in Indian infrastructure: Sh. Deepak Moudgil, Managing Director of Gilco Global since 2017, retired previously as Director (Projects) at Engineers India Ltd, the public-sector engineering consultancy, with experience spanning approximately 60 million sq ft of urban infrastructure across multiple sectors. The Moudgil family group's prior infrastructure experience extends across decades; the founding of Gilco Global in 2014 represented the family group's entry into the elevator sector specifically.

Gilco Global today operates across nine Indian cities — Delhi, Gurgaon, Noida, Ghaziabad, Faridabad, Chandigarh, Bangalore, Mathura, and Bhiwadi — serving residential, commercial, hospital, institutional, and industrial customers. The firm's commercial position rests on the EN 81-compliant Orona product range, applied to the Indian market without the specification compromises that this paper has discussed in earlier chapters. Gilco Global's role in the partnership with Hidral that publishes this paper is to bring the on-the-ground market knowledge, customer relationships, and operational presence that any responsible Indian-market entry requires; Hidral's role is to bring complementary engineering depth in heavy-load, custom, and special-application segments.

gilcoglobal.in

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For comments, questions, criticism, or commitments to adopt one or more of the manifesto principles in Chapter 11:

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