

Aligning Corporate Strategy with Environmental, Social, and Governance (ESG): A Case Study of InfraTrans

Grace Lucy Secioputri¹, Utomo Sarjono Putro²

School of Business and Management, Institut Teknologi Bandung^{1,2}

*Email: grace_secioputri@sbm-itb.ac.id

Abstract

As Environmental, Social, and Governance (ESG) principles become central to corporate strategy, transportation infrastructure firms face mounting pressure to integrate sustainability into their operations. This study investigates how InfraTrans—a pseudonym for one of the toll road operators in Indonesia—can align its corporate strategy with global ESG frameworks to enhance transparency, regulatory compliance, investor confidence, and long-term resilience. Employing a qualitative case study design, the research draws on semi-structured interviews with key internal and external stakeholders, document analysis, and ESG benchmarking against the GRI and SASB standards. The findings reveal critical gaps in InfraTrans's ESG practices, notably in emissions tracking, supplier assessments, infrastructure lifecycle management, and digital reporting. The study proposes seventeen ESG-oriented strategies derived through SWOT and TOWS matrix analyses to address these. These are organized into two categories: ESG Foundations, focusing on governance, disclosure, audit systems, and employee capacity-building, and ESG Pillars, which emphasize digital integration, sustainable infrastructure development, and stakeholder engagement. Each strategy is explicitly linked to identified ESG disclosure gaps and has been validated by industry experts to ensure relevance, feasibility, and alignment with Indonesian regulatory frameworks and investor expectations. The study concludes with a phased implementation roadmap, offering actionable insights for transportation infrastructure companies seeking to elevate their ESG performance and strategic positioning, particularly in emerging markets.

Keywords: ESG strategy; sustainable transportation infrastructure; ESG benchmarking; GRI and SASB frameworks; SWOT and TOWS analysis

A. INTRODUCTION

Sustainability has evolved from a peripheral initiative to a central pillar of corporate strategy, particularly in industries with substantial environmental and social footprints. The transportation infrastructure sector is no exception. Globally, companies are increasingly evaluated not only by their financial performance but also by their Environmental, Social, and Governance (ESG) commitments—a shift driven by growing regulatory demands, investor scrutiny, and public accountability.

In Indonesia, the urgency of ESG adoption intersects with an ambitious national infrastructure agenda. The government's commitments to the Paris Agreement and the Sustainable Development Goals (SDGs) have been operationalized through regulations such as PER-1/MBU/03/2023 from the Ministry of State-Owned Enterprises, which requires companies to embed sustainability principles into their operations. The toll road industry, in particular, serves a strategic role in enhancing national connectivity. The Ministry of Finance forecasts the construction of 182 kilometers of new toll roads and the expansion of 50.8 kilometers of existing roads in 2024 alone. However, such growth raises questions about environmental degradation, carbon emissions, and social equity, especially in light of Indonesia's pledge to achieve net-zero emissions by 2060. To bridge this gap, the Ministry of Public Works has introduced the Penilaian Jalan Tol Berkelanjutan (JTB), a sustainability evaluation tool to embed ESG practices in toll road operations. Despite its promise, the JTB framework lacks granular benchmarks and alignment with the country's Enhanced Nationally Determined Contributions (ENDC), creating a gap between regulatory intent and actionable implementation.

InfraTrans (a pseudonym for one of the toll road operators in Indonesia) stands at the nexus of this transition. As an enterprise with significant operational reach, InfraTrans is under governmental and market pressure to lead on sustainability. A recent shareholder aspiration letter from the Ministry of SOEs, though not legally binding, reflects an evolving expectation: ESG performance is no longer a voluntary

* Corresponding author

aspiration but a proxy for corporate responsibility and strategic resilience. This expectation mirrors global trends. ESG issues such as climate risk, social inequality, and supply chain ethics are now considered material business risks. (Wattimena, 2023) underscores the centrality of ESG in modern risk governance, while studies by (Eccles and Klimenko, 2019; Friede et al., 2015) demonstrate that companies with robust ESG integration often outperform competitors and weather market shocks more effectively. Yet, firms in emerging markets like Indonesia struggle with inconsistent regulations, limited internal capacity, and fragmented ESG disclosures (OECD, 2021).

InfraTrans exemplifies these tensions. While the company has initiated several ESG-related programs—from environmental assessments to stakeholder engagement—these efforts remain fragmented and lack a cohesive strategic framework. Its ESG risk rating, particularly on environmental dimensions, remains suboptimal. (Sustainalytics, 2023) reports highlight key weaknesses in emissions disclosure, supply chain oversight, and digital privacy protocols—gaps that can hinder access to green finance and damage investor confidence. This study aims to evaluate InfraTrans's current ESG posture and identify strategic pathways for alignment with global ESG frameworks. Drawing on semi-structured interviews with internal and external experts, as well as document analysis and benchmarking grounded in the GRI and SASB standards, the study offers actionable recommendations tailored to InfraTrans's context. As shown in Figure 1, a conceptual framework is proposed to structure these recommendations, aiming to strengthen ESG integration in Indonesia's toll road infrastructure sector.

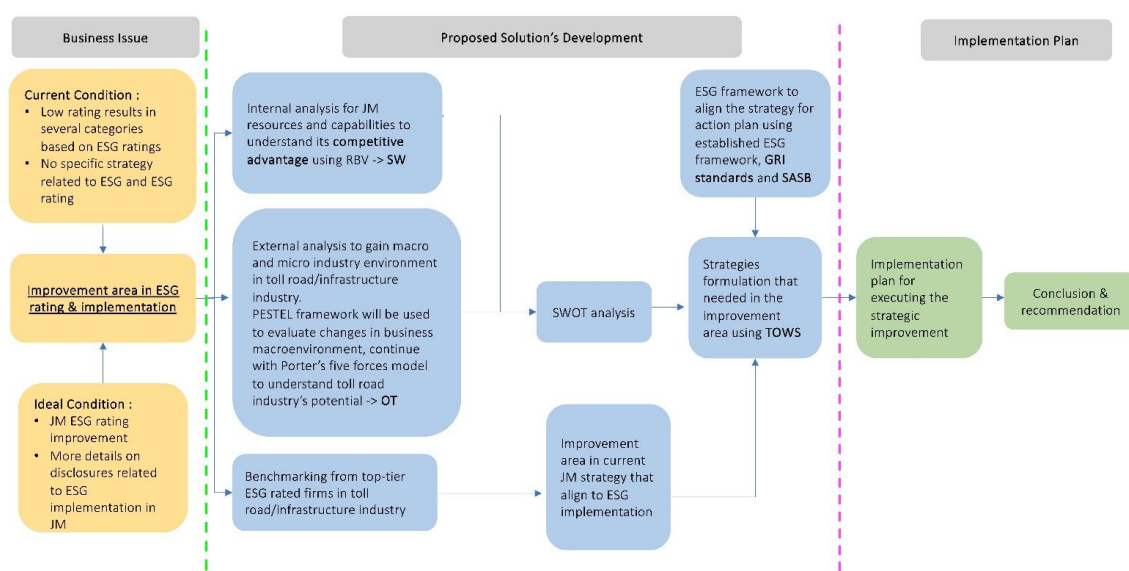


Figure 1. Conceptual Framework
 Source: Authors Adaptation, 2025

B. METHODS

This study adopts a qualitative case study design to investigate the alignment between InfraTrans's corporate strategy and internationally recognized Environmental, Social, and Governance (ESG) principles. The qualitative approach is appropriate for exploring complex, context-specific phenomena such as ESG integration in state-owned enterprises within emerging markets. This design enables an in-depth analysis of internal capabilities and external environmental dynamics that shape strategic ESG adoption. The data collection process involved two primary sources: secondary documents and semi-structured interviews. Secondary data consisted of InfraTrans's internal documents—including annual reports, ESG policy statements, and strategic plans—and external materials such as academic literature, regulatory guidelines (e.g., PER-1/MBU/03/2023), and benchmarking reports aligned with the Global Reporting Initiative (GRI) and Sustainability Accounting Standards Board (SASB) frameworks. These documents provided a baseline to evaluate InfraTrans's ESG maturity and disclosure practices. Primary data were gathered through Key Informant Interviews (KIIs) with six carefully selected respondents using

purposive non-probability sampling. The participants represented key internal and external stakeholders directly involved in ESG-related decision-making. Interviews were conducted in a semi-structured format to allow thematic consistency while maintaining flexibility for deeper probing based on the expertise of each informant.

Table 1. Interview Participants and Roles

Participant Category	Role/Position
Internal Experts	ESG Advisor; Head of Concession Business Planning
Internal Leaders	Subsidiary President, Directors, and ESG-related Department Heads
External Expert	CFO of the Indonesia Investment Authority (INA), with ESG financing expertise
Total Interviews Conducted	6 Key Informant Interviews

Source: Research data, 2025

Interview questions were structured around five core themes: 1) regulatory and institutional pressure on ESG adoption; 2) internal capabilities and reporting systems; 3) external expectations from investors and civil society; 4) supply chain and operational challenges; and 5) technology, funding, and innovation. For example, internal experts were asked how changing regulatory dynamics impact ESG strategy setting, while subsidiary leaders were probed on implementation barriers and social license issues. External experts provided insights on investor expectations, ESG return on investment, and access to green finance. The full list of interview questions has been moved to Appendix A to maintain clarity and focus in the main text. However, the summary below captures the thematic alignment of the interviews:

Table 2. Summary of Interview Focus Areas

Interview Group	Key Themes Explored
Internal Experts	ESG governance, regulatory interface, emissions strategy, investor pressure, internal alignment
Subsidiary Leaders	Operationalization challenges, supply chain, renewable technology, ESG reporting gaps
External Expert	Financial impact of ESG ratings, regulatory risk, access to green bonds, industry-wide benchmarks

Source: Research data, 2025

The data analysis proceeded in three stages. First, a document review identified ESG disclosure gaps by comparing InfraTrans's reporting practices with peer firms (e.g., Transurban, Atlas Arteria) using GRI and SASB standards as benchmarks. This allowed the researchers to construct a detailed baseline of ESG visibility and identify critical areas requiring strategic improvement. Second, interview transcripts were analyzed using manual qualitative coding, following a three-step process: open coding to identify distinct stakeholder expressions, axial coding to consolidate codes into broader thematic categories, and selective coding to connect these themes to strategic ESG gaps. This interpretive coding process followed guidelines from (Sheppard, 2021), enabling the emergence of grounded insights. For example, terms like "fragmented disclosure," "lack of emission baseline," and "digital monitoring gap" were coded and clustered into categories such as governance structure, data readiness, and stakeholder trust. Third, the study synthesized findings through strategic Analysis using a triangulated framework: 1) PESTEL and Porter's Five Forces frameworks assessed the external environment, identifying political, economic, technological, and competitive pressures influencing ESG integration; 2) The Resource-Based View (RBV) was applied internally to assess InfraTrans's tangible and intangible ESG assets and capabilities; and 3) These insights were consolidated in a SWOT and TOWS matrix, from which 17 ESG-aligned strategic recommendations were generated and categorized into Foundations and Pillars.

To strengthen methodological rigor and ensure the validity of findings, the research team employed triangulation across data types and validated strategic recommendations through expert feedback from the original interviewees. Each proposed strategy was evaluated based on four criteria: relevance, feasibility, potential impact, and implementation speed. Feedback was gathered through structured follow-ups and scored using a 1–4 Likert scale. While this study provides deep insights into ESG strategy alignment, several limitations must be acknowledged. First, as a single-case study focused on InfraTrans, the findings may not be fully generalizable across the infrastructure sector. However, InfraTrans serves as a representative case for state-owned infrastructure operators navigating ESG transformation under regulatory and market pressures in Southeast Asia. Second, manual coding, though enabling rich interpretation, is subject to researcher bias. Future research could adopt mixed-method approaches, broader sampling, and digital qualitative analysis tools (e.g., NVivo) for greater objectivity and scalability. Despite these limitations, the study provides a strategically grounded roadmap for ESG

transformation in infrastructure enterprises. By linking internal capabilities to external ESG rating mechanisms and national policy objectives, the research offers actionable insights for firms seeking to enhance their ESG integration in complex emerging market contexts.

C. RESULTS AND DISCUSSION

This section presents the findings from qualitative interviews, document analysis, and ESG benchmarking activities. Rather than offering a descriptive inventory of InfraTrans's current practices, the Analysis interrogates how InfraTrans engages with ESG principles, identifies disclosure and strategic gaps, and reveals the company's overall ESG maturity and readiness. The Analysis proceeds in four parts: current ESG visibility, internal capability, external pressure, and strategic synthesis. Each builds toward offering a clear, actionable pathway for ESG alignment.

InfraTrans's Current ESG Visibility

InfraTrans has taken some initial steps toward ESG integration, most notably through a recent materiality assessment that identified 13 key ESG topics aligned with Global Reporting Initiative (GRI) standards. These include energy, emissions, occupational health and safety, anti-corruption, and customer health and safety. However, while the topics are relevant, public-facing disclosures remain inconsistent and incomplete. To assess InfraTrans's ESG transparency, the study benchmarked its disclosures against leading peers—Transurban Group and Atlas Arteria Ltd.—using GRI and SASB (Sustainability Accounting Standards Board) frameworks.

Table 3. Benchmarking of InfraTrans Disclosure According to GRI and SASB Framework

Material Topic Group	Atlas	Transurban	InfraTrans
GRI Framework			
GRI 2 (General Disclosure)	√	√	√
GRI 3 (Material Topics)	√	√	√
GRI 201 (Economic Performance)	√	√	√
GRI 202 (Market Presence)	X	√	√
GRI 203 (Indirect Economic Impact)	√	√	√
GRI 204 (Procurement Practices)	√	√	√
GRI 205 (Anti-Corruption)	√	√	√
GRI 301 (Materials)	X	√	X
GRI 302 (Energy)	√	√	√
GRI 303 (Water and Effluents)	√	√	√
GRI 304 (Biodiversity)	√	√	X
GRI 305 (Emissions)	√	√	√
GRI 306 (Waste)	√	√	X
GRI 308 (Supplier Environmental Assessments)	√	√	X
GRI 401 (Employment)	√	√	√
GRI 403 (Occupational Health and Safety)	√	√	√
GRI 404 (Training and Education)	√	√	√
GRI 411 (Right of Indigenous Peoples)	√	√	X
GRI 413 (Local Communities)	√	√	√
GRI 414 (Supplier Social Assessment)	√	√	X
GRI 415 (Public Policy)	X	√	X
GRI 416 (Customer Health and Safety)	√	√	√
GRI 417 (Marketing and Labeling)	X	√	√
GRI 418 (Customer Privacy)	X	√	X
SASB Framework			
Environmental Impacts of Project Development	√	√	X
Structural Integrity & Safety	X	√	X
Workforce Health & Safety	√	√	X
Lifecycle Impacts of buildings & infrastructure	√	√	X
Climate Impacts of Mix	√	√	X
Business Ethics	√	√	√

Source: Research data, 2025

Unlike its peers, InfraTrans lags in disclosing performance metrics, lifecycle assessments, supplier criteria, and risk projections. Table 4 below outlines critical disclosure gaps.

Table 4. Summary of ESG Gaps in InfraTrans Reporting

No.	ESG Framework	Topic	Relevant Disclosure in AR/SR	Gap/Need Improvement
1.	GRI	Materials (GRI 301)		No information has been disclosed on this topic.
2.	GRI	Energy (GRI 302)	Energy use (46.2 TJ), EV charging station expansion	No energy intensity metric per unit toll km. There is no detailed information about energy sources (RE and conventional). No detailed information about energy saving in quantitative terms and strategy
3.	GRI	Biodiversity (GRI 304)	Implementation of AMDAL, disclosure of information about using forest area permits, and tree planting activities.	Undisclosed information about protection or rehabilitation other than Bali. Not all toll projects had their biodiversity impact analyzed.
4.	GRI	Emissions (GRI 305)	Scope 1, Scope 2, and Scope 3 GHG Emissions (tonC)2eq. Emission reduction efforts	The details for Scope 3 emissions were not fully disclosed (there was a lack of information about customer GHG emissions and any detailed information categorized in Scope 3). Undisclosed carbon offsets in quantitative
5.	GRI	Waste (GRI 306)		No detailed information has been disclosed on this topic.
6.	GRI	Supplier Environmental Assessments (GRI 308)		How InfraTrans chooses suppliers or vendors using environmental criteria is not fully disclosed. No quantitative data suppliers or vendors were chosen based on environmental criteria. No quantitative data shows that vendors' or suppliers' assessments have a negative impact. No information about action taken to mitigate the negative environmental impact on the supply chain
7.	GRI	Local Communities (GRI 411)		No information has been disclosed on this topic.
8.	GRI	Supplier Social Assessment (GRI 414)		It is not fully disclosed how InfraTrans chooses suppliers or vendors using social criteria (human rights, occupational health and safety, and labor). Social criteria chose no quantitative data suppliers or vendors. No quantitative data shows vendors' or suppliers' assessment, which has a negative social impact. No information about the action taken to mitigate the negative social impact in the supply chain
9.	GRI	Public Policy (GRI 415)		No information has been disclosed on this topic.
10.	GRI	Customer Privacy (GRI 418)		Undisclosed information about complaints of customer privacy and losses of customer data, nor action taken to mitigate the issues
11.	SASB	Environmental Impacts of Project Development (IF-EN-160a.1 & a.2)	Green corridor development, AMDAL compliance, limited quantified disclosures	Lack of quantified environmental non-compliance incidents, subcontractor violations, or environmental violations. Lack of detail in the project lifecycle. Unidentified the use of international codes and process gaps applied across all projects
12.	SASB	Structural Integrity & Safety (IF-	Green toll initiative, rest area safety design, and no structural failure data	There is no disclosure on rework, construction defect costs, or the corrective action implemented. No information about

No.	ESG Framework	Topic	Relevant Disclosure in AR/SR	Gap/Need Improvement
		EN-250a.1 & a.2)		monetary losses from legal proceedings related to safety defects
13.	SASB	Workforce Health & Safety (IF-EN-320a.1)	K3 initiatives, risk awareness training	There is no disclosure about the total recordable incident rate (TRIR) and fatality rate for direct employees (individuals on the entity's payroll) or contract employees (such as a contractor)
14.	SASB	Lifecycle Impacts of Infrastructure (IF-EN-410a.1 & a.2)	There is no mention of certified projects or integrated energy/water planning	Lack of data clarification on the sustainability standard used and an active project seeking such certification. Lack of information on operational phase energy and water efficiency considerations in project planning and design

Source: Research data, 2025

The implications are evident in InfraTrans's Sustainalytics ESG Risk Rating (2023), which scored 12.9, significantly lower than Transurban (7.2) and Atlas Arteria (7.7). The study disaggregated risk factors based on Sustainalytics' criteria to understand key contributors to this low rating.

Table 5. Sustainalytics Breakdown of InfraTrans's ESG Risk Rating (2023)

Management Indicators	Raw Score	Weight (%)	Weighted Score	Remark
Product and service safety	50	18,2%	9,1	The company has an adequate program
Lobbying and political expenses	100	15,2%	15,2	Based on available evidence, the company does not make political contributions and is not involved in lobbying activities.
Non-GHG air emissions programs	25	12,6%	3,2	The company has a weak program
Emergency response programs	25	7,1%	1,8	The company has a weak program
Board diversity	0	6,7%	-	The company's board diversity raises severe concerns.
Board independence	50	6,2%	3,1	The company's level of board independence is adequate
Bribery & corruption policy	25	5,5%	1,4	The company has a weak policy or a general statement addressing the issue
QMS certifications	25	5,4%	1,4	Between 0 and 25% of the company's sites have received certification
Environmental policy	50	4,6%	2,3	The company has an adequate policy
Whistleblower programs	75	4,6%	3,5	The company has a strong program
Verification of ESG reporting	50	4,5%	2,3	Verification of ESG reporting is adequate
ESG reporting standards	25	3,3%	0,8	The company's ESG reporting is weak
Scope of social supplier standards	0	1,9%	-	The company does not have social supply chain standards based on available evidence.
ESG governance	30	1,2%	0,4	A board committee is responsible for overseeing governance issues only
Global Compact signatory	0	0,4%	-	The company is not a signatory to the UN Global Compact.
	Constant		2,7	
	Momentum		9,5	
	Weighted Sum		46,9	Average

Remark of InfraTrans ESG Risk Management: The company's disclosure is poor, signaling inadequate accountability to investors and the public. It has some initiatives to manage risks related to material ESG issues. However, the initiatives are not sufficient to manage all of its risks. Nevertheless, the company has not been implicated in any significant ESG-related controversies.

Source: Research data, 2025

The top three agendas that should be improved are product and service safety, non-GHG air emissions programs, and emergency response programs. According to Sustainalytics, Material ESG issues specifically for the highway and railroads subindustry lie:

1. Product governance that covered the agenda (Product and Service Safety), prioritizing product quality, service safety, and responsible marketing. We need to enhance the InfraTrans ESG framework gaps to improve this section. Area of improvement will be GRI 418 (Customer Privacy), GRI 308 (Supplier Environmental Assessment), GRI 414 (Supplier Social Assessment), SASB Environmental impacts of Project Development (IF-EN-160a.1 & a.2), SASB Structural Integrity & Safety (IF-EN-250a.1 & a.2), SASB Workforce Health & Safety (IF-EN-320a.1), and SASB Lifecycle Impacts of Infrastructure (IF-EN-410a.1 & a.2).
2. The improvement of non-GHG air emissions programs conducted by InfraTrans is part of the Sustainability ESG Material issue, especially in Stakeholder Governance, which assesses the company's commitment to global standards such as environment, anti-corruption, human rights, etc. Area improvement will be GRI 302 (Energy), GRI 305 (Emissions), and SASB Lifecycle Impacts of Infrastructure (IF-EN-410a.1 & a.2).
3. Part of Stakeholder Governance, to improve ESG rating performance in the emergency response section programs, area improvement will be SASB Environmental Impacts of Project Development (IF-EN-160a.1 & a.2), SASB Structural Integrity & Safety (IF-EN-250a.1 & a.2), and SASB Workforce Health & Safety (IF-EN-320a.1).

Therefore, external situational Analysis and internal capabilities will be assessed to generate suitable strategies to solve the improvement needs in the categories above. Qualitative data from six KIIs has been analyzed using manual coding for further assessment using PESTEL and Porter's Five Forces framework and Resource-Based View for understanding the internal capabilities.

Internal ESG Capability and Readiness

Using the Resource-Based View (RBV), the study mapped InfraTrans's internal strengths and weaknesses from interview coding.

Table 6. Internal Capability Assessment of InfraTrans

Aspects	InfraTrans's Analysis*	Category
Tangible Assets	Technology digitalization readiness	Strength
	Fragmented reporting and lack of a reporting standard	Weakness
	Lack of standardized ESG targets and infrastructure disparity	Weakness
	Comprehensive wastewater management	Strength
	Renewable energy implementation improvement	Strength
	Biodiversity management and implementation strategy readiness	Strength
	Integrated wastewater management and technologies	Strength
	Advanced toll operation technology and operational efficiencies	Strength
	EV charging infrastructure expansion.	Strength
	Need for improvement in emission and management planning	Weakness
	Supplier management and dependencies	Weakness
	Integrated water management and technologies	Strength
	Inclusivity and social infrastructure readiness	Strength
	Lack of emission guidelines, baseline, and data management	Weakness
Intangible Assets	High ESG awareness as corporate culture	Strength
	Established ESG partnerships	Strength
	ESG compliance and integration gaps	Weakness
	DEI in human capital and a well-established employee improvement capability	Strength
	Employee competency and organizational preparedness gaps	Weakness
	Service safety readiness	Strength

Note: *InfraTrans's Analysis is generated from axial coding through the 6 KIIs interview transcript manual coding process

Source: Research data, 2025

While InfraTrans possesses digital readiness and a growing sustainability culture, ESG implementation remains siloed and under-structured across business units.

External Pressures and Industry Dynamics

External pressures—regulatory, Investor, and societal—also shape InfraTrans's ESG posture. These are analyzed using PESTEL and Porter's Five Forces. InfraTrans does not operate in a vacuum. It is embedded in a national infrastructure ecosystem shaped by regulatory expectations, investor sentiment,

peer performance, and public scrutiny. This section uses insights from PESTEL and Porter's Five Forces frameworks to examine the external forces currently shaping the urgency and opportunity for ESG integration. It considers the role of ministries, funding access, civil society expectations, and competitive pressures that collectively signal why ESG is no longer a "nice-to-have" but a business imperative for InfraTrans. This external Analysis will assess InfraTrans's opportunities and threats in a business environment, as shown in Table 7.

Table 7. InfraTrans External Analysis

PESTEL Analysis		
Aspects	Transportation Infrastructure Sector Analysis*	Category
Political	Supportive ESG initiative from the government	Opportunity
	Regulatory uncertainty and enforcement gaps	Threat
	High influence from the government for regulatory changes that impact toll road tariffs	Threat
Economy	ESG implementation and rating attractiveness to investors or financing	Opportunity
	Policy and fiscal constraints for ESG implementation	Threat
	ESG implementation benefits for efficiency	Opportunity
	Resource and cost constraints for ESG implementation	Threat
Social	Adequate capability in stakeholder relations and social impact	Opportunity
	Inadequate ESG awareness, organizational culture, and capability	Threat
	Land acquisition and community conflict resolution challenge	Threat
	Social pressure and expectations	Opportunity
Technology	High cost and lack of technological capacity in green technology adaptation	Threat
	Lack of green technology standard	Threat
Environmental/ecology	Environmental & social risk management for operational excellence	Opportunity
	ESG value and collaborative enhancement	Opportunity
Legal	Insufficient ESG baseline, target, and measurement	Threat
	Lack of ESG regulatory standards in the transportation infrastructure (toll road) sector	Threat
	Transportation infrastructure sector (toll road industry) compliance with regulatory standards and environmental management	Opportunity
	Land use regulatory barrier.	Threat
Porter's Five Forces Analysis		
Aspects	Transportation Infrastructure Sector Analysis*	Category
Rivalry Among Existing Competitors	Competitive dynamics driven by ESG principles	Opportunity
	Leveraging low ESG competitiveness in the sector to unlock market leadership opportunity	Opportunity
Bargaining Power of Buyers	Investor evaluation and attention to ESG criteria	Opportunity
	Users are less sensitive to ESG performance and implementation	Opportunity
Bargaining Power of Suppliers	Limited ESG supplier and supplier management	Threat
Threat of New Entrants	Potential for competition in toll roads and PPP through ESG-focused criteria	Opportunity
	High capital and regulatory barriers to entry to the transportation infrastructure (toll road) sector and sustainable technologies	Threat
Threat of Substitute Products or Services	Less impact on product or service substitutes regarding sustainability trends	Opportunity
	Rising awareness among consumers of sustainable alternatives	Opportunity

Note: *Industry's Analysis is generated from axial coding through the 6 KIIs interview transcript manual coding process
Source: Research data, 2025

According to insights derived from expert interviews and thematic coding, there is clear evidence that Indonesia's policy landscape is progressively aligning with the Sustainable Development Goals. However, the actual regulatory framework governing ESG implementation remains inconsistently defined and fragmented, particularly in the transportation infrastructure sector. This creates a disconnect between national policy aspirations and operational realities. KPMG (2020) describes this phenomenon as the "policy-practice gap," where state mandates promote ESG principles rhetorically but lack the regulatory clarity, enforcement mechanisms, and sector-specific benchmarks needed for effective implementation. A case in point is the Ministry of Public Works' Penilaian Jalan Tol Berkelanjutan (JTb), an ESG performance assessment tool for toll road operators, which, despite its promise, is yet to be supported by

rigorous indicators, reporting templates, or compliance incentives. From an economic standpoint, the rationale for ESG adoption is becoming more compelling. Institutional investors, development finance institutions, and sovereign wealth funds are increasingly factoring ESG metrics into their investment criteria (PwC Indonesia, 2023). InfraTrans acknowledges this shift in its 2023 Sustainability Report, noting rising expectations from long-term financiers for transparent ESG disclosures and credible risk mitigation strategies. However, a persistent internal barrier is the perception of ESG as a cost center rather than a strategic investment. This mindset inhibits proactive adoption and hinders efforts to integrate ESG into core business value creation.

Technological readiness further complicates this equation. While ESG ambitions continue to grow, driven by policy and market forces, the availability and affordability of enabling technologies lag. Advanced systems for energy efficiency, clean construction, digital emissions tracking, and smart tolling infrastructure remain limited in Indonesia. Although InfraTrans has piloted initiatives such as solar-powered rest areas and digitized toll operations, the scalability of these innovations is constrained by high costs, supplier ecosystem immaturity, and insufficient technical capacity. These gaps were also highlighted in InfraTrans's Sustainalytics ESG risk rating, particularly around infrastructure lifecycle management and supply chain screening. From a legal perspective, the absence of ESG-specific standards tailored to toll road operators represents a significant regulatory blind spot. While international frameworks such as GRI and SASB offer general ESG guidance, sectoral contextualization is critical. As the OECD (2021) noted, infrastructure sectors require granular, enforceable regulations that reflect their unique operational and environmental risks. ESG implementation remains ad hoc without such standards, often treated as project-level compliance rather than an enterprise-wide legal and strategic commitment. This increases exposure to legal and reputational risks, especially where land use, environmental protection, or third-party contractor practices intersect with ESG obligations.

The industry's competitive landscape is also transforming. Historically, high capital requirements and regulatory barriers have limited market entry. However, ESG performance is rapidly emerging as a strategic differentiator, particularly in public-private partnerships (PPPs) and concession awards. As Henisz, Koller, and Nuttall (2019) argue, companies that lead on ESG tend to build stronger stakeholder trust, enhancing their eligibility for future contracts and positioning them for sustainable growth. While end-users (toll road customers) may not yet be ESG-sensitive in their consumption choices, investors and lenders increasingly are. ESG ratings now influence access to green bonds, sustainability-linked loans, and blended finance mechanisms, shifting the pressure from symbolic compliance to meaningful transformation. InfraTrans operates in a dynamic and increasingly demanding environment where ESG is transitioning from a voluntary initiative to a strategic necessity. The PESTEL and Porter's Five Forces analysis confirms that InfraTrans's ESG journey is shaped by external expectations and internal readiness. Regulatory gaps, technology constraints, and market conservatism present tangible challenges. Yet, significant windows of opportunity remain, particularly for first movers willing to institutionalize ESG as a core business function. The strategic imperative is clear: ESG adoption is no longer about appeasing regulators or investors but securing long-term competitiveness, credibility, and operational resilience in an evolving infrastructure landscape.

SWOT, Strategic Synthesis, and Implementation Plan

To guide InfraTrans toward a more structured and internationally competitive ESG posture, this section synthesizes the company's internal and external realities into a strategic roadmap. The Analysis begins with a SWOT framework that captures internal strengths and weaknesses, along with opportunities and threats drawn from the earlier PESTEL and Porter's Five Forces analyses. As (Rothaermel, 2023) notes, SWOT analysis is not only a diagnostic tool but a platform for envisioning competitive transformation. In the case of InfraTrans, this tool enables a strategic response to ESG integration challenges in a dynamic infrastructure landscape. The SWOT analysis was then developed into a TOWS matrix, a strategic mapping model that matches each internal factor (strengths or weaknesses) with external conditions (opportunities or threats). From this synthesis, a set of tailored ESG strategies was formulated. These strategies were not generated in isolation—they were explicitly mapped to fill disclosure gaps identified in ESG benchmarking using GRI and SASB frameworks while addressing material weaknesses identified in InfraTrans's 2023 ESG rating report from Sustainalytics.

As shown in Figures 2 and 3, strategies are categorized across the four classic TOWS quadrants: SO (Strength–Opportunity), ST (Strength–Threat), WO (Weakness–Opportunity), and WT (Weakness–Threat). These strategies were then clustered into two interdependent categories: ESG Foundations and ESG Pillars. The rationale for this distinction is strategic. ESG Foundations are essential prerequisites that ensure readiness and credibility. Without these, any higher-order ESG initiatives risk fragmentation or greenwashing. Once these foundations are firmly in place, ESG Pillars—the more visible, impactful transformation projects—can be scaled across InfraTrans’s operations.



Figure 2. InfraTrans SWOT Matrix
Source: Research data, 2025

TOWS Matrix		STRENGTHS		WEAKNESSES	
Propose Strategies for InfraTrans					
		51. Technology digitalization readiness 52. Comprehensive waste-water management 53. Renewable energy implementation improvement 54. Biodiversity management and implementation strategy readiness 55. Integrated waste water management and technologies 56. Advanced toll operation technology and operational efficiencies 57. On-going infrastructure expansion 58. Integrated water management and technologies 59. Security and social infrastructure readiness 60. High ESG awareness as corporate culture 61. Established ESG partnerships 62. Dedicated human capital and well-established employee improvement capability 63. Service safety readiness		W1. Fragmented reporting and lack of report standard W2. Lack of standardized ESG target and infrastructure disparity W3. Need for improvement in emission and management planning W4. Supplier management and dependencies W5. Lack of emission guideline, baseline, and data management W6. ESG compliance and integration gaps W7. Employee competency and organizational preparedness gaps	
OPPORTUNITIES	01. Supportive ESG initiative from government 02. ESG implementation and rating attractiveness to investor or financing 03. Adequate capability in stakeholder relations and social impact 04. Social pressure and expectations 05. Environmental & social risk management for operational excellence 06. ESG value and collaborative enhancement 07. Transportation infrastructure sector (toll road industry) compliance with regulatory standards and environmental management 08. Competitive dynamics driven by ESG principles 09. Leveraging ESG competitiveness in the sector to unlock market leadership opportunity 10. Inevitable evolution to ESG criteria 11. Use less resource to ESG performance and implementation 12. Potential for competitive toll road and PPP through ESG-focused criteria standards and environmental management 13. Less impact to product or service substitute regarding sustainability trends 14. Rising awareness among consumers to sustainable alternatives	01-02 Leverage technology digitalization to accelerate in ESG initiative adoption and real-time ESG monitoring in line with government policy. 03-04 Expand renewable energy projects across toll operations (such as in implemented solar panel) to enhance ESG rating appeal for green financing and investor attractions. 05-11-15 Develop an Environmental Protection Strategy to manage and monitor environmental risks and compliance during project construction and operation 07-09 Enhance InfraTrans's Safety Protocols and deploy digital monitoring tools for real-time compliance safety standards during project constructions and operations 10-15-20 Utilize InfraTrans's current service safety readiness to support environmental & social risk management objectives with evolving a digital monitoring tools 12-13-14-15-20 Deploy a digital privacy policy in reporting and tracking platform to increase data transparency and security and meet InfraTrans's Safety Protocols	W3-W5-05-01 Establish emission baselines and management plans to support ESG operational excellence W4-03-02 Implement supplier ESG assessments and onboarding frameworks to improve ESG scoring in PPP tenders W5-02 Standardize ESG reports using global frameworks (GRI and SASB) to increase transparency and ESG investor appeal W1-W2-07 Improvement in InfraTrans's current Safety Protocols with additional capacity in reporting the TPR and fatality rate during construction and operation W3-03 Upskill employees through ESG training and certification programs to strengthen stakeholder engagement and ESG delivery.		
THREATS	15. Regulatory uncertainty and enforcement gaps 16. High influences from government for regulatory changes that impacts toll road tariffs 17. Policy and fiscal constraints for ESG implementation 18. Resource and cost constraints for ESG implementation 19. Inadequate ESG awareness, organizational culture and capability 20. Land acquisition and community conflict resolution challenge 21. High cost and land of technological capacity in green technology adoption 22. Lack of green technology standard 23. Inefficient ESG baseline, target, and measurement 24. Lack of local ESG regulatory standard in transportation infrastructure (toll road) sector 25. Land use regulatory barrier 26. Limited ESG supplier and supplier management 27. High cost and regulatory barrier to entry in the transportation infrastructure (toll road) sector and sustainable technologies	15-16 Apply safety readiness to manage land acquisition and community conflict resolution via proactive stakeholder engagement and emergency response protocols 15-19 Use digital systems to improve ESG awareness and organizational capability through integrated ESG training platforms. 24-25-55-56-58-74-76-78-79 Establish InfraTrans sustainable toll infrastructure management by eco-sensitive design to standardize InfraTrans ecosystem management (waste water, biodiversity, and toll operation technology) into scalable green infrastructure templates	W-23 Disseminate clear emissions guidance to align with fiscal and policy shift impacting ESG execution. W1-23 Integrated ESG criteria and audits into InfraTrans's procurement process to mitigate risks associated with inadequate ESG vendor management W3-10 Establish a unified integrated sustainability certification framework		

Figure 3. InfraTrans's Proposed Strategies using TOWS Matrix
Source: Research data, 2025

The ESG Foundations comprise three strategic domains. First is ESG Governance and Disclosure Transparency, which includes establishing emission baselines, issuing emissions guidance aligned with fiscal policy, and standardizing ESG reporting following global frameworks such as GRI and SASB. This

also includes critical enhancements in safety metrics, such as integrating TRIR and fatality rate disclosures during construction and operational phases. Second, the ESG Standardized Audit System and Certification are proposed to reduce compliance risk and improve supply chain transparency. This includes the creation of an integrated sustainability certification framework and incorporating ESG criteria in procurement and vendor audits. In tandem, InfraTrans is encouraged to develop an Environmental Protection Strategy that moves beyond AMDAL compliance and supports proactive risk monitoring. The third foundational domain is Human Capital and Stakeholder Management. While digital tools and reporting systems are vital, human capability is the true driver of ESG transformation. To ensure consistent implementation across subsidiaries, InfraTrans must institutionalize ESG-focused training and certification programs, particularly for mid- and senior-level management.

Once these ESG foundations are established, the company can scale its ESG Pillars. These high-impact strategies are grouped into two areas. First is Digital ESG Infrastructure and Real-Time Monitoring, which enhances ESG performance through advanced monitoring systems, cybersecurity protocols, and digital ESG dashboards. These systems should integrate service safety readiness with environmental and social risk mitigation. InfraTrans is also advised to deploy privacy incident tracking tools and e-learning platforms for continuous ESG skill development. Moreover, real-time ESG monitoring, supported by IoT technologies and big data analytics, will position InfraTrans at the frontier of smart infrastructure governance. Second, the Sustainability Infrastructure and Social Responsibility pillar encompasses long-term investments in green infrastructure and community-focused initiatives. This includes renewable energy deployment, such as solar panels in rest areas, ESG-based supplier onboarding frameworks, and the development of scalable ecosystem templates—standardized infrastructure designs that embed ESG principles into every planning and construction phase. These templates will address waste management, biodiversity preservation, and water efficiency. Furthermore, InfraTrans is encouraged to formalize emergency response and stakeholder engagement protocols to manage social risks such as land acquisition conflicts.

All strategies were subjected to expert validation involving five internal stakeholders at InfraTrans. Each strategy was assessed based on four criteria: (1) Relevance—whether the strategy addresses a material ESG gap; (2) Feasibility—whether it is realistic under current organizational conditions; (3) Impact—its potential to improve ESG performance or investor perception; and (4) Implementation Speed—how quickly the strategy delivers viable results. Experts used a Likert scale (1 = strongly disagree; 4 = strongly agree) to evaluate each criterion. Regarding timing, strategies were rated based on their estimated implementation horizon: 1 = within 1 year, 2 = 1–2 years, 3 = 2–3 years, and 4 = more than 3 years. Experts agreed that the strategies were highly relevant and feasible, with average scores ranging between 3 and 4 across all categories.

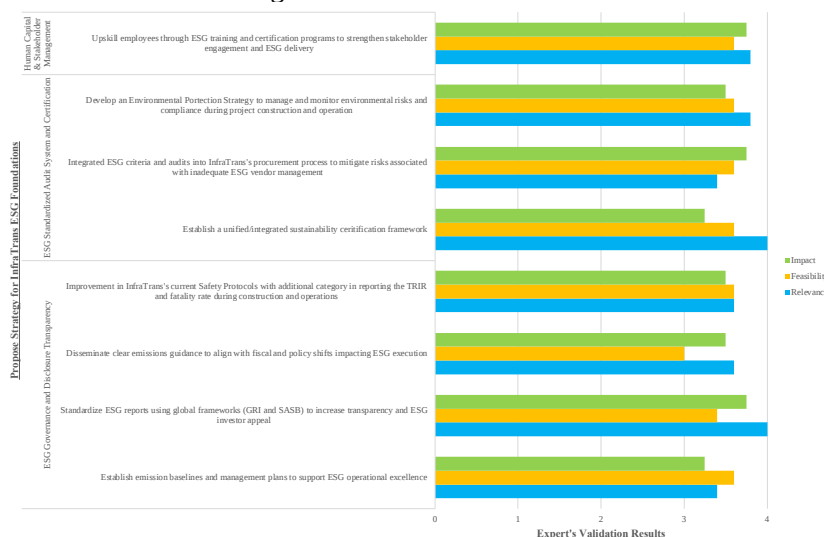


Figure 4. InfraTrans's ESG Foundation Experts Validation Results
 Source: Research data, 2025

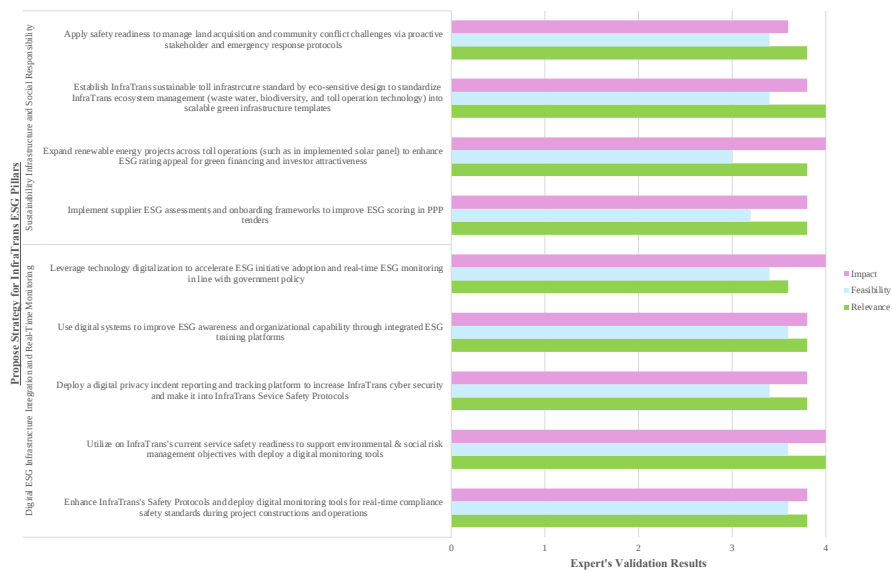


Figure 5. InfraTrans's ESG Pillars Experts Validation Results

Source: Research data, 2025

Foundational strategies were generally achievable within the first two years, whereas pillar strategies were more resource-intensive and spread across a multi-year timeline. The full-phased roadmap is detailed in Table 8.

Table 8. InfraTrans Strategies Implementation Plan

PROPOSE STRATEGIES	Propose InfraTrans ESG Foundations and Pillars	PHASE 1: 2026 - 2027	PHASE 2: 2028 - 2029	PHASE 3: 2030 - 2034
W3 W5-O5 O1 Establish emission baselines and management plans to support ESG operational excellence	ESG Governance and Disclosure Transparency			
W1-O2 Standardize ESG reports using global frameworks (GRI and SASB) to increase transparency and ESG investor appeal				
W5-T3 Disseminate clear emissions guidance to align with fiscal and policy shifts impacting ESG execution.				
W1 W2-O7 Improvement in InfraTrans's current Safety Protocols with an additional category in reporting the TRIR and fatality rate during construction and operations				
W2-T10 Establish a unified/integrated sustainability certification framework	ESG Standardized Audit System and Certification			
W4-T12 Integrated ESG criteria and audits into InfraTrans's procurement process to mitigate risks associated with inadequate ESG vendor management				
S10 S11-O5 Develop an Environmental Protection Strategy to manage and monitor environmental risks and				

PROPOSE STRATEGIES	Propose InfraTrans ESG Foundations and Pillars	PHASE 1: 2026 - 2027	PHASE 2: 2028 - 2029	PHASE 3: 2030 - 2034
compliance during project construction and operation				
W7–O3 Upskill employees through ESG training and certification programs to strengthen stakeholder engagement and ESG delivery.	Human Capital & Stakeholder Management			
S13–O7 Enhance InfraTrans's Safety Protocols and deploy digital monitoring tools for real-time compliance with safety standards during project construction and operations	Digital ESG Infrastructure Integration and Real-Time Monitoring	InfraTrans's ESG Pillars		
S1 S13–O3 O5 Utilize InfraTrans's current service safety readiness to support environmental & social risk management objectives with the deployment of digital monitoring tools				
S1 S10 S13–O4 O5 O11 Deploy a digital privacy incident reporting and tracking platform to increase InfraTrans cybersecurity and make it into InfraTrans Service Safety Protocols				
S1–T5 Use digital systems to improve ESG awareness and organizational capability through integrated ESG training platforms.				
S1–O1 Leverage technology digitalization to accelerate ESG initiative adoption and real-time ESG monitoring in line with government policy.				
W4–O3 O12 Implement supplier ESG assessments and onboarding frameworks to improve ESG scoring in PPP tenders	Sustainability, Infrastructure, and Social Responsibility			
S3–O2 Expand renewable energy projects across toll operations (such as implemented solar panels) to enhance ESG rating appeal for green financing and investor attractiveness.				
S1 S13–O3 O5 Utilize InfraTrans's current service safety readiness to support environmental & social risk management objectives with the deployment of digital monitoring tools				
S2 S4 S5 S6 S8–T4 T6 T11 Establish InfraTrans sustainable toll infrastructure standard by eco-sensitive design to				

PROPOSE STRATEGIES	Propose InfraTrans ESG Foundations and Pillars	PHASE 1: 2026 - 2027	PHASE 2: 2028 - 2029	PHASE 3: 2030 - 2034
standardize InfraTrans ecosystem management (wastewater, biodiversity, and toll operation technology) into scalable green infrastructure templates.				
S13-T6 Apply safety readiness to manage land acquisition and community conflict challenges via proactive stakeholder and emergency response protocols				

Source: Research data, 2025

The SWOT and TOWS synthesis reveals that InfraTrans is well-positioned for a structured ESG transformation. Its digital readiness and environmental management strengths can be leveraged to address material weaknesses in supplier oversight, emissions tracking, and disclosure practices. Externally, regulatory ambiguity and capital costs present challenges, but these are balanced by growing investor demand, policy momentum, and technological innovations that InfraTrans can adopt and scale. By sequencing strategies into Foundations and Pillars, the study provides a pragmatic roadmap for InfraTrans to elevate its ESG profile regarding operational practice and global ESG ratings. If implemented with discipline and adaptability, these strategies will enable InfraTrans to become a national model for ESG leadership in transportation infrastructure.

Discussion

This study analyzes ESG integration within InfraTrans, Indonesia's major toll road operator. Through a qualitative case study lens, several key insights have emerged regarding the challenges and the transformative potential of ESG adoption in infrastructure sectors within emerging economies. This discussion critically reflects on those insights, engaging with relevant theoretical frameworks and global ESG discourse to position the findings in the broader academic and practical context.

ESG as a Strategic Imperative: From Compliance to Value Creation

The findings confirm that ESG is transitioning from a peripheral compliance activity to a central strategic driver—a shift mirrored in regulatory trends and investor behavior. However, this evolution is marked by asymmetries. InfraTrans exhibits high-level awareness and early initiatives but lacks the integrated systems, standardized disclosures, and organizational alignment necessary to deliver ESG at scale. This aligns with Trade-Off Theory (Eccles & Klimenko, 2019), which posits that companies often perceive ESG investments as cost centers rather than strategic assets, especially when the financial returns are indirect or long-term. The perception remains evident at InfraTrans, where short-term budget priorities and fragmented internal structures often constrain initiatives like renewable energy expansion and digital ESG systems. Yet, the growing pressure from sovereign funds and international lenders, who increasingly link financing to ESG performance, suggests that this trade-off is narrowing. ESG is no longer a cost vs. value dichotomy; it is becoming a prerequisite for future value creation.

Stakeholder Pressure and Organizational Legitimacy

The Analysis also reaffirms the relevance of Stakeholder Theory (Freeman, 1984) in shaping ESG priorities. InfraTrans operates within a dense stakeholder ecosystem, including regulators, community groups, institutional investors, and the general public. While customer sensitivity to ESG remains low in this sector, investor expectations and government signals have become critical external forces. While non-binding, the "aspiration letter" issued by the Ministry of SOEs carries significant influence in steering strategic direction, reflecting the institutional power of soft regulation. Moreover, ESG performance is increasingly linked to corporate legitimacy in public-private partnerships. As (Henisz et al., 2019) argue, companies that lead in ESG are more likely to win public trust and access high-impact infrastructure opportunities. InfraTrans's relatively low ESG rating (12.9 by Sustainalytics) reflects not only disclosure gaps but also a broader credibility deficit in the eyes of stakeholders. Closing this gap is not just a reputational issue but an issue of market access and financing eligibility.

The Maturity Gap: Between Policy Rhetoric and Operational Practice

A key insight from the external environment analysis is what KPMG (2020) calls the policy–practice gap. While the Indonesian government has issued multiple ESG-aligned policies—including ENDC commitments and sector-specific tools like the Penilaian Jalan Tol Berkelanjutan (JTB)—the regulatory infrastructure remains underspecified and weakly enforced. This creates ambiguity at the operational level, where firms like InfraTrans must navigate competing mandates, evolving standards, and inconsistent enforcement. This tension creates strategic inertia, where companies await more explicit regulatory guidance instead of proactively shaping their ESG trajectory. It also highlights the importance of internal governance readiness, as seen in the foundational strategies proposed in this study. InfraTrans must move beyond waiting for regulation and instead invest in systems, audits, and human capital that can autonomously anticipate and adapt to ESG demands.

ESG Rating Mechanisms and Materiality Prioritization

The study’s benchmarking and rating analysis underscores a critical point: ESG rating mechanisms, such as those by Sustainalytics, increasingly emphasize quantified, standardized, and forward-looking disclosures. InfraTrans underperforms on key material metrics such as non-GHG emissions programs, emergency response protocols, and product/service safety—areas that align with sector-specific ESG materiality maps (SASB, 2022). As (Eccles, 2019) suggests, by applying Pareto improvement logic, focusing on the top three rating deficiencies could deliver outsized improvements in the overall ESG score. Moreover, ESG rating agencies increasingly penalize companies for lack of integration—i.e., when policies exist but are not embedded in operations, supplier networks, or risk systems. The strategic synthesis presented in this study responds directly to this challenge, offering a pathway from fragmented compliance to embedded governance.

Emerging Market Context: Complexity and Innovation

Finally, the Indonesian context provides a valuable case for examining ESG adoption in emerging markets, where the intersection of developmental goals, institutional volatility, and infrastructure needs produces unique ESG tensions. As OECD (2021) notes, infrastructure firms in these regions often face “double materiality”: they must account not only for the sustainability of their operations but also for their broader socio-economic impacts, such as land acquisition, local employment, and environmental degradation. This study shows that while ESG tools and frameworks are often imported from global norms, their success depends on localized adaptation. InfraTrans’s strategies must respond to local constraints, such as the limited availability of green technology vendors and the patchy digital readiness of subcontractors while maintaining alignment with global expectations.

Table 9. Summary of Theoretical Contributions

Theory	Insight from This Study
Trade-Off Theory	ESG is increasingly a source of long-term value, not just a cost center.
Stakeholder Theory	ESG legitimacy is driven more by institutional stakeholders (government, investors) than end-users.
Rating Mechanisms	ESG ratings reflect materiality, integration, and forward-looking disclosures.
Institutional Theory	Policy-practice gaps in emerging markets demand stronger internal ESG governance.

Source: Research data, 2025

The study suggests that strategic ESG integration is achievable for practitioners and policymakers, even within complex, resource-constrained environments. However, it requires a dual focus: first, on building internal ESG governance infrastructure; second, on targeted transformation in areas of material rating impact. InfraTrans—and similar firms in the sector—should consider ESG not as a reporting burden but as an operational framework for risk resilience, competitiveness, and public legitimacy.

To consolidate the strategic direction outlined in this study, the ESG transformation strategy for InfraTrans can be visualized as an integrated framework that connects foundational enablers with strategic pillars to achieve a holistic and scalable ESG implementation. At the core of this framework is the overarching objective: strengthening InfraTrans’s ESG governance, transparency, and implementation. Two primary strategic pillars support this: Digital ESG Infrastructure Integration, Real-Time Monitoring, Sustainability Infrastructure, and Social Responsibility. The first pillar focuses on implementing ESG-integrated digital tools to automate key compliance processes such as emissions tracking, safety oversight,

and data responsiveness, thereby enhancing operational visibility and responsiveness. The second pillar emphasizes ESG-aligned project governance, infrastructure risk management, and strengthening social and privacy safeguards across operations. These pillars are only effective when built upon strong institutional foundations. Thus, the base of the framework is formed by three foundational enablers: ESG Governance and Disclosure Transparency, which ensures that ESG data are reported in a standardized and credible manner; ESG Standardized Audit System and Certification, which provides structured compliance mechanisms and vendor screening protocols; and Human Capital and Stakeholder Management, which equips personnel with the ESG competencies needed for implementation and ensures that internal alignment and external stakeholder engagement are institutionalized. Collectively, this model reinforces the conclusion that ESG transformation at InfraTrans must be approached as a systems-level change, not a series of disjointed initiatives. The success of ESG performance improvement will depend on how digital innovation, strategic governance, and human capability are integrated under a coherent, forward-looking ESG architecture.

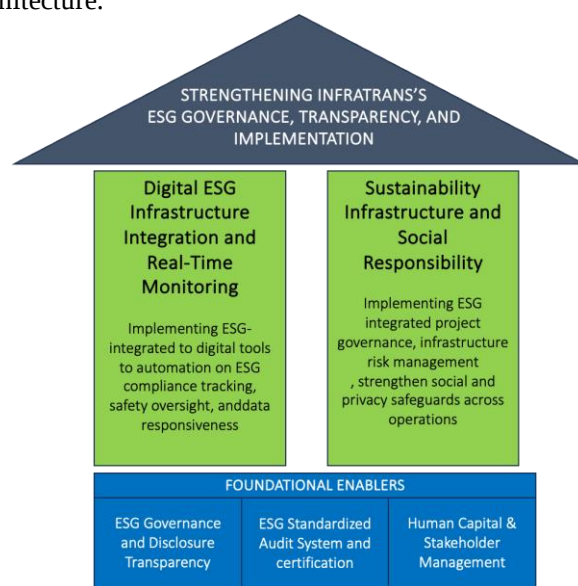


Figure 6. InfraTrans Strategy Improvement for Strengthening ESG Implementation
 Source: Research data, 2025

D. CONCLUSIONS

This study investigates how InfraTrans, a state-owned toll road operator in Indonesia, can strategically realign its corporate direction to integrate better Environmental, Social, and Governance (ESG) principles. Anchored in the Global Reporting Initiative (GRI) and the Sustainability Accounting Standards Board (SASB) frameworks, the study sought to diagnose gaps in ESG implementation and generate actionable strategies that could enhance InfraTrans's ESG rating and long-term resilience. Utilizing a qualitative methodology—document analysis, expert interviews, peer benchmarking, and TOWS-based strategic synthesis—the study finds that InfraTrans represents a familiar case among legacy infrastructure firms: one that is not starting from zero but not yet ESG-mature. The organization possesses significant resources, pilot initiatives, and institutional support; however, the absence of strategic coherence, standardized disclosures, and embedded governance structures impedes the realization of meaningful ESG outcomes.

Findings reveal that these efforts remain fragmented while InfraTrans has taken commendable early steps—such as materiality assessments, partial sustainability integration in project cycles, and selected environmental pilot projects. Disclosure practices lack consistency, key ESG topics such as Scope 3 emissions, supply chain assessments, and data privacy are underdeveloped, and ESG responsibilities are diffusely distributed across the organization. In response, this study proposed a dual-tier strategy framework consisting of: 1) ESG Foundations: initiatives to establish baseline capabilities in governance, reporting, certification, and internal alignment; 2) ESG Pillars: more advanced strategies focused on digital infrastructure, supplier engagement, community relations, and environmental

innovation. These 17 strategies were derived through a TOWS matrix, matching InfraTrans's internal strengths and weaknesses with external opportunities and threats. The framework was subsequently validated by domain experts, who affirmed its feasibility and potential impact. The result is a tailored ESG roadmap that can guide InfraTrans—and potentially other SOEs in the infrastructure sector—toward improved ESG performance, ratings, and credibility with investors, regulators, and civil society.

Limitations and Directions for Future Research

Like all qualitative case studies, this research is context-specific and carries certain limitations that should be acknowledged. First, the study focuses solely on InfraTrans as a representative case of ESG transition in Indonesia's public infrastructure domain. While the findings provide valuable insights, they are not statistically generalizable. Future studies may apply similar methods across multiple firms or sectors to build comparative or sector-wide ESG maturity models. Second, the study centers primarily on internal perspectives from management and internal experts. The exclusion of key external voices—such as regulators, community stakeholders, and ESG rating agencies—limits the breadth of the stakeholder lens. Subsequent research would benefit from including multi-stakeholder perspectives, especially in exploring how ESG actions are perceived and evaluated beyond the corporate boundary. Third, ESG frameworks and benchmarks are rapidly evolving. While this study employed leading standards (GRI, SASB, RBV, TOWS), their relevance and weightings may change as global standards evolve, particularly with the rise of ISSB-aligned disclosures, taxonomy regulations, and ESG assurance protocols.

Based on these limitations, three avenues for future research are proposed: 1) Cross-case comparative studies across public and private transportation infrastructure companies in Indonesia or Southeast Asia to identify sectoral patterns, challenges, and best practices in ESG integration; 2) Quantitative impact analysis to empirically assess the financial and operational return on ESG investment—e.g., through regression modeling of ESG performance against funding costs, project delays, or maintenance savings; and 3) Stakeholder perception studies to understand how communities, investors, and customers interpret ESG actions within the infrastructure sector, and how these perceptions influence brand equity, trust, and regulatory favorability. Such studies could be critical in linking ESG communication with long-term institutional legitimacy.

Ultimately, this study contributes to the growing body of literature emphasizing that ESG is not just a technical compliance issue but a strategic governance challenge, particularly in emerging markets. For InfraTrans and its peers, ESG success will not come from checklists or fragmented initiatives but from intentional alignment, institutional capacity-building, and systems-level thinking. The roadmap proposed herein offers a blueprint for that transition—contextually grounded, theoretically informed, and pragmatically validated.

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Appendix A: Study Objectives, Participants, and Interview List Of Questions (Author Analysis)

Study	:	Aligning Corporate Strategy with Environmental, Social, and Governance (ESG) in InfraTrans
Sub Study	:	Exploration of the institutional and market pressures on ESG integration in InfraTrans and preliminary review of ESG readiness in InfraTrans
Objectives	:	1. To gain situational conditions in InfraTrans' current condition on ESG implementation regarding opportunities and challenges in the toll road business sector while implementing the ESG framework, including in its subsidiaries 2. To obtain InfraTrans's organizational strengths and weaknesses in ESG implementation, including in its subsidiaries
Research Participants	:	• InfraTrans internal experts: ESG Advisor and Concession Business Planning Group Head • InfraTrans internal leaders: President, Directors, and Department Head • Toll road business external experts: Chief Financial Officer of Indonesia Investment Authority (INA)
Data Collection Tools and Sample Size	:	Key Informant Interview (KII) for experts and decision-makers (6 KIIs)
KII List of Questions for Internal Experts	:	1. Are there any political risks or changes in regulation that might impact future ESG implementation and InfraTrans? Also, how does the relationship between InfraTrans and regulators (e.g., BPJT, Ministry of SOEs) influence ESG target setting? 2. What are the significant challenges in implementing environmental initiatives across InfraTrans subsidiaries, and how does the company measure and manage the environmental impact? 3. Has the company faced public resistance or social pressure that shaped its ESG direction? 4. What are the significant challenges in reporting and tracking ESG performance? 5. How does the ESG rating affect InfraTrans's ability to attract funding, and does it show a measurable return on investment or cost savings? 6. What challenges has InfraTrans faced in complying with national or international ESG regulations? 7. What do you think of the toll road industry? Is it difficult to enter the industry? 8. Are there any government incentives that lower entry barriers for more sustainable toll road developers? 9. How much pressure comes from investors or lenders regarding ESG criteria and reporting? 10. Are toll road users demanding more visible sustainability actions? 11. Do ESG ratings factor into InfraTrans's competitive advantage or brand perception, and how does the competition among Toll Road Business Entities (TRBEs) factor in? 12. How might sustainability trends shift users toward non-toll options and reduce toll road traffic? 13. How dependent is InfraTrans on suppliers for ESG-related services? 14. Does the company have any strategy to ensure ESG compliance across the supply chain? 15. What are the key physical assets InfraTrans owns that support ESG efforts, and are there any unique features? 16. How can the company implement smart toll technology for efficiency and environmental benefits? 17. Does the company have access to green finance instruments like ESG bonds or KPBU that meet environmental criteria? Does it affect investor interest or financing terms? 18. Are ESG-related KPIs included in performance reviews or reward systems? 19. How would you describe the current ESG knowledge and skills across InfraTrans's teams? 20. Are there dedicated cross-functional teams or task forces for ESG coordination?
KII List of Questions for Internal Leaders	:	1. What are the major challenges in implementing environmental initiatives across InfraTrans's subsidiaries? 2. How does the company measure and manage the environmental impact? 3. What are the key social issues InfraTrans faces during toll road development (e.g., land acquisition, community acceptance)? And how does the company handle and engage with local communities affected by toll road projects? 4. What technologies currently support ESG reporting or environmental monitoring (e.g., sensors, smart tolling)? 5. Is there an initiative to integrate renewable or energy-efficient technologies in toll road operations? 6. What barriers does the company face in adopting green technologies or digital ESG platforms? 7. What are the major challenges in reporting and tracking ESG performance? 8. How do ESG ratings affect InfraTrans's subsidiaries' ability to attract funding or investors? 9. What do you think about the current regulation related to ESG in InfraTrans's subsidiaries? Has the government set any targets? 10. Has the company faced public resistance or social pressure that shaped its ESG direction? 11. How might sustainability trends shift users toward non-toll options and reduce toll road traffic? 12. How dependent is InfraTrans on suppliers for ESG-related services (e.g., carbon offset providers, green construction materials)?

	13. How much pressure comes from investors or lenders regarding ESG criteria and reporting? 14. Are toll road users or communities demanding more visible sustainability actions? 15. What are the key physical assets InfraTrans owns that support ESG efforts, and are there any unique features? 16. Does the company have access to green finance instruments like ESG bonds or KPBU that meet environmental criteria? Does it affect investor interest or financing terms? 17. Are ESG-related KPIs included in performance reviews or reward systems? 18. How would you describe the current ESG knowledge and skills across InfraTrans's teams? 19. Are there dedicated cross-functional teams or task forces for ESG coordination? 20. Do InfraTrans's subsidiaries have alliances, joint ventures, or strategic partnerships that enable access to green technologies, ESG expertise, or sustainable construction methods?
KII List of Questions for External Experts	1. Are there any political risks or changes in regulation that might impact future ESG implementation and the industry? 2. How do ESG ratings affect the industry's ability to attract funding or investors (e.g., green bonds)? 3. Have ESG initiatives shown any measurable return on investment or cost savings so far? 4. What are the major challenges in reporting and tracking ESG performance? 5. What are the major challenges in implementing environmental initiatives in the toll road industry? 6. Are there any specific ESG compliance targets set by ministries that TRBEs must meet? 7. What do you think of the toll road industry? Is it difficult to enter the industry? 8. Are there government incentives or regulations that lower entry barriers for more sustainable toll road developers? 9. How much pressure comes from investors or lenders regarding ESG criteria and reporting, especially in toll road industries? 10. How much pressure comes from customers regarding ESG criteria and reporting, especially in toll road industries? 11. Are toll road users or communities demanding more visible sustainability actions? 12. How dependent are TRBEs on suppliers for ESG-related services (e.g., carbon offset providers, green construction materials)? 13. How might sustainability trends shift users toward non-toll options? Will it affect future toll road traffic? 14. Are there industry benchmarks or peer pressures pushing TRBEs to improve ESG performance?